



Developing Natural and Social Science Books Integrating Science Process Skills to Enhance Student Learning Outcomes in Fifth Grade Elementary School

Nurmayani Daulai¹, Siti Mayang Sari², Akmaluddin³

^{1,2,3}Universitas Bina Bangsa Getsempena, Banda Aceh, Indonesia

E-mail: ¹nurmay043@gmail.com *, ²mayang@bbg.ac.id , ³akmaluddin@bbg.ac.id

*Corresponding Author

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ABSTRACT

Existing textbooks in elementary education often fail to engage students fully and do not effectively enhance their science process skills. This research aims to develop science and social studies books based on science process skills to improve the learning outcomes of fifth-grade elementary school students. Observations reveal that current textbooks are not sufficiently engaging and fail to enhance students' science process skills. Using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) method, this research and development study produced a Science Process Skills Based Science book. The results show that this book significantly improves student learning outcomes, with students achieving an average score of 88, exceeding the minimum completeness criteria of 75. The book's validity is rated as very feasible, and 88% of students met the very good criteria, with 29 students completing the standard. The study concludes that quality teaching incorporating science process skills greatly enhances student learning outcomes, making learning activities more meaningful and effective. This research contributes to education by providing a validated resource that fosters essential science skills development in elementary students.

Keywords: *Books, Natural and Social Sciences, Science Process Skills, Learning Outcomes*



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INTRODUCTION

Education has an important role in the development process of a nation. The world of education is expected to provide professional human resources to advance the country with science and technology. Each country aims to ensure that every member of society can develop their abilities in the physical, intellectual and moral fields in a democratic manner. Every individual in every country has the opportunity to obtain a good education (Subiyantoro & Arief, 2024). This goal is also supported by the fact that each individual has different abilities and creativity, so that these abilities can be developed more meaningfully.

The quality of education in Indonesia, the Ministry of Education, Culture, Research and Technology has attempted to improve the quality of education through developing a curriculum known as the "Independent Curriculum". In this independent curriculum, natural science learning is integrated with social science to become Natural and Social Sciences (Filina

et al., 2022); (Sari et al., 2022). The problem with learning Natural and Social Sciences in this curriculum is that it has not developed students' interest in curiosity (Rahimah, 2022); (Agustina et al., 2023), students play an active role in developing inquiry skills (Permata Puspita Hapsari & Zulherman, 2021); (Faisal et al., 2022), understanding themselves and their environment (Mufida et al., 2021); (Utami & Dewi, 2020); (Wulandari et al., 2019), as well as developing knowledge and understanding of Natural and Social Sciences concepts (Sari et al., 2022); (I. N. Dewi et al., 2019); (Adeshola & Abubakar, 2020).

Students are no longer just objects of learning, but become subjects of learning. Teachers must carefully prepare and plan learning that can develop students' understanding and process skills (Safadel & White, 2020) One of the student process skills addressed is science process skills (Malau & Juniar, 2020); (T. M. Dewi, 2019); (Sari et al., 2020). Science Process Skills (KPS) in the learning process have various advantages (Mayang et al., 2021); (Safaruddin et al., 2020). One of them is training students to be able to search for knowledge independently so that limited meeting time in class does not become an obstacle for students to learn (Purnamasari & Suryanti, 2022); (Rustamovna, 2020).

Science process skills are an important aspect in learning, research by Sari et al (2021) in their research states that education is not only focused on mastering material (Tarliany et al., 2019); (Nurbaeti, 2019), but also on mastering skills (Latifah, 2019), In other research (Nurhabibah et al., 2019) shows that there is an influence of the application of science process skills on improving student learning outcomes (Mayang Sari et al., 2022); (Rahmah et al., 2019). This increase in learning outcomes is due to an increase in students' scientific attitudes and analytical abilities (Malau & Juniar, 2020); (Hunaepi et al., 2020). Based on this data, science process skills are important in learning at school to improve student learning outcomes (Mufida et al., 2021); (Annuuru et al., 2019).

The reality in schools is that science process skills have not been a concern in education (Subiyantoro, 2024). The results of a preliminary study conducted on September 11 2023 at Seunebok Johan State Elementary School show that learning is still teacher centered. The teacher acts as a source of information who transfers knowledge to students, while students passively receive information from the teacher. Observation results show that the learning process carried out in class focuses on developing knowledge aspects without any efforts to improve students' skills in the science process. This data is strengthened by the results of the analysis of textbooks used as learning resources at the Seuneubok Johan State Elementary School, namely the science package books published by the Ministry of Education and Culture 2017 for Class V Semester II which do not include all indicators of Science Process Skills.

Analysis of other learning support modules used in schools, in the form of science enrichment modules for Seuneubok Johan State Elementary School semester II, shows that the presentation of information in the modules is material-oriented. In line with the results of interviews with class V science teachers on September 18 2023, it was revealed that one of the reasons for the lack of implementation of science process skills-based learning was the absence of textbooks that were in accordance with the Science Process Skills steps. Limited sources of books based on Science Process Skills in supporting learning causes teachers' understanding of science process skills to not develop. In other words, the books used at Seuneubok Johan State Elementary School have not facilitated students in developing Science Process Skills. This condition strengthens the assumption that the learning process at Seuneubok Johan State Elementary School focuses on knowledge aspects without paying attention to aspects of students' science process skills.

Appeal from the Ministry of Education, Culture, Research and Technology for the implementation of the Independent Curriculum. In this case, Sschool Dlost NEgeri Seuneubok Johan has implemented the Independent Curriculum. In this independent curriculum, natural science learning is integrated with social science to become Natural and Social Sciences. The

research results show that there is an influence of applying science process skills in science learning to improve student learning outcomes (Nurhabibah et al., 2019). Low student skills have an impact on decreasing student learning outcomes (Yulistiana & Setyawan, 2020). Therefore, books based on Science Process Skills are needed in the learning process to improve student learning outcomes.

METHODS

The research employs the ADDIE (Analysis, Design, Development, Implementation, Evaluation) method, a systematic approach commonly used in development research (Research & Development). This method focuses on the main processes of the learning system development process to produce effective educational products (Sugiyono, 2017). In the Analysis phase, needs assessment and problem identification are conducted to determine the gaps in existing textbooks and the requirements for enhancing science process skills among fifth-grade students. The Design phase involves outlining the framework and content of the science and social studies books, including the integration of science process skills activities. During the Development phase, the actual content is created, incorporating multimedia elements and interactive activities to make the books engaging and effective. The Implementation phase involves testing the books in real classroom settings with fifth-grade students, allowing for practical application and observation of their impact on learning outcomes. Finally, the Evaluation phase assesses the effectiveness of the books through various evaluation methods, such as student performance scores, feedback from teachers and students, and comparison with established benchmarks. This comprehensive approach ensures that the developed books are not only educationally sound but also practical and effective in improving student learning outcomes.

RESULTS AND DISCUSSION

Based on the research results, it is proven that the increase in student learning outcomes in understanding is marked by the Gain value. Gain is the difference between the posttest and pretest scores. Gain shows the increase in students' abilities after the learning process. The normalized N-Gain test was carried out to show how much students' abilities increased in cognitive aspects after participating in Natural and Social Sciences learning with Natural and Social Sciences Books Based on Science Process Skills. The N-Gain calculation is the difference between the posttest and pretest scores divided by the difference between the highest score and the pretest score. Following are the N-Gain score results:

Table 1. N-Gain

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_Score	29	.25	,100	.8865	.23522
Ngain_Persen	29	25.00	100.00	88.6551	23.52174
Valid N (listwise)	29				

Table 1. It can be seen from the results of the N-Gain Score that the mean value is 0.8865, this value is greater than 0.3 ($0.88 > 0.3$), so the category obtained is high/high effectiveness. N-Grain Percent mean value is 88.6551, this value is greater than 76% ($88\% > 76\%$), so it is interpreted as effective. So it can be concluded that the use of Natural and Social Science Books Based on Science Process Skills to improve student learning outcomes has proven to be effective.

The Science Process Skills Based Natural and Social Science book developed is a development of the Natural and Social Science learning book which was developed into a Natural and Social Science Based Book. Science Process Skills that have different elements. The book developed is based on Science Process Skills which contains material to make it easier for

students to know the real form of Natural and Social Science material. The product being developed is carried out in accordance with the development procedures used in developing this learning media, adapted from (Lee & Owens) 2004. The development model focuses on multimedia development, namely the ADDIE model with five stages, namely: analysis (needs analysis), design (product plan), development (Creation of Natural and Social Science Books Based on Science Process Skills, Validation of design, material and language experts), implementation (product application, product feasibility), and evaluation (product effectiveness).

The information obtained from observations in class V of the Seuneubok Johan State Elementary School still lacks references to Natural and Social Sciences learning and student learning outcomes in Natural and Social Sciences learning are still low. Learning only uses conventional books, namely books and student worksheets provided by the school and there is a lack of learning books for teachers to use.

Researchers are trying to develop a product in the form of a learning book to add teacher references to learning Natural and Social Sciences. The researcher developed a Natural and Social Science Book Based on Science Process Skills. The researcher presented an attractive design that suited the characteristics of students, with concepts that were short and easy for teachers and students to understand. Attractive design, able to stimulate students to be more interested in learning. The following is an explanation of the steps in developing a Natural and Social Science Book Based on Science Process Skills.

The first stage of this development is to carry out an analysis, namely needs analysis, identifying what books teachers and students need to improve student learning outcomes and create a more interesting learning process. Based on the results of the analysis, data showed that the average student score was 70 and the percentage of completeness was 70%. Based on this data, it is stated that student learning outcomes are still low which is caused by the implementation of learning that is not varied and teachers only use one reference, namely books from the government. Therefore, the researcher developed a Natural and Social Sciences Book Based on Science Process Skills which is felt to provide a new variation in the Natural and Social Sciences learning process as well as an action which is felt to be able to improve the learning outcomes of class V S students.school Dlost NEgeri Seuneubok Johan. The following is documentation of the needs implementation analysis:



Figure 1. Needs Analysis

The second stage is the design stage, namely product design. The researcher's product design first determines learning indicators, materials and determines the book design. At the material design stage, researchers refer to Learner Achievements and Learning Objectives in Natural and Social Sciences learning. Natural and Social Science Books Based on Science Process Skills are designed according to teacher needs to function as an addition to teacher references or teacher handbooks.

The Natural and Social Science Book product based on Science Process Skills has been developed according to the plan, a design, material and language validation process is carried out to determine the validity of the product that has been developed. The Natural and Social Sciences Books Based on Science Process Skills were validated by lecturers at Bina Bangsa Getsempena University, Banda Aceh. Based on the overall assessment of design experts, it can be concluded that an average of 92%, media experts 93%, materials experts 94% and language experts 90% are obtained by the Science Process Skills Based Natural and Social Sciences Book which can be implemented for class V Students. Seuneubok Johan State Elementary School with a very worthy category.

The fourth stage is implementing the learning book directly to students. From the results of calculating student and teacher responses above, it can be seen that based on the data obtained, the data obtained from the results of the teacher's responses obtained a score of 96% and this can be categorized as the Natural and Social Science Book Based on Science Process Skills is a very good and practical learning book for developed. And the data obtained from the results of student responses obtained a score of 92.5% and this can be categorized as the Natural and Social Science Book Based on Science Process Skills is an interesting learning book for students. This shows that the Natural and Social Science Book Based on Science Process Skills aims to add teacher references as a teacher's handbook. This can be categorized as the Natural and Social Science Book Based on Science Process Skills which is a very suitable learning book for students. The following is the implementation of the Natural and Social Science Book Based on Science Process Skills:



Figure 2. Implementation of learning using science and social studies books based on science process skills

In the final stage, namely the evaluation stage, researchers measured whether the Natural and Social Science Books Based on Science Process Skills could improve students' abilities through test questions. Based on the results of the evaluation of test questions for class V students, they obtained a percentage result of 88% in the effective category. Proven by the value of N Gain Score has a mean value of 0.8865, this value is greater than 0.7 ($0.88 > 0.7$), so the category obtained is high/high effectiveness. N-Grain Percent mean value is 88.6551, this value is greater than 76% ($88\% > 76\%$), so it is interpreted as effective. Basically, the teaching and learning process is a communication process that occurs from teacher to student or between students. In the process of conveying the message, a medium is needed so that the message can be received well. The use of books provides benefits in the learning process, including: 1) clarifying the presentation of messages and information so that the learning process runs smoothly and improves learning outcomes, 2) increasing student motivation, by directing students' attention so as to enable students to learn independently according to their

abilities and interests. Learning books are one of the supporting materials that can be used by teachers, but a teacher must be careful and precise in choosing learning books so that learning books will be able to motivate students, increase student activity and arouse student interest in learning so that students' attention is focused on the topic of the material being discussed. One of the learning books that can be used as a learning resource which is felt to be able to help students and teachers in the learning process is by using Natural and Social Science Books Based on Science Process Skills.

CONCLUSION

The process of developing Natural and Social Science Books Based on Science Process Skills uses the ADDIE model (Analysis, Design, Development and Implementation, Evaluation) the researcher carried out all stages. Based on the results of the analysis, the data obtained showed that the students' average score before the action was 70 and the completion percentage score was 70%. The results of the development research show that the Natural and Social Science Books Based on Science Process Skills in lessons for fifth grade elementary school students produced are said to be very feasible. This is proven by the media expert validation results showing a very good category (96%) from the average validator. The material expert validation results show a very good category (96%) from the average validator. Linguist validation results show a very good category (98%) from the average validator.

The results of the student response product trials showed the very good category (92.5%) and the results of the teacher response product trials showed the very good category (96%). In the evaluation of the test results, students obtained a result of 88% with very good criteria with details of 29 students completing. So from this research the criteria have been fulfilled, namely the very good category in validation results, teacher and student response results and test question results, so these results are proof that the Natural and Social Science Book Based on Science Process Skills is very suitable and can be used as a learning book which can improve student learning outcomes. The learning achievements provided by teachers provide meaning for the future of the school and students, the products developed will be able to be used as a contribution by teachers and other researchers who can re-develop them with different achievements and goals so that there will be an increase in research and technology as well as educational research innovation.

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