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Development of Natural Science Teaching Book Based on Local Wisdom for the Improving of Learning Outcomes of Students of Grade IV Public Primary School 2 Karangmangu District Sarang Rembang Regency

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Abstract: A teaching book can be defined as a paper in the form of a book in a particular field, which is a standard book used by teachers and students in the teaching and learning process for instructional purposes and purposes, which is equipped with suitable teaching facilities and easily understood by the user in schools and colleges to support the teaching program. The purpose of this study analyzed the development of Natural Science teaching books based on local wisdom in grade IV students of Sarang District of Rembang Regency. The research methods used in this study use Research and Development research methods by showing an increase in student learning outcomes in grade IV elementary school Natural Science materials drawn from test techniques and practicums. The research was conducted in the Pasopati group, namely Public Elementary School No. 2 Karangmang, Public Elementary School No. 1 Karangmangu, and Public Elementary School Temperak District Sarang Rembang Regency. The data analysis used includes analysis of written test results and analysis of average comparison of written test results. Based on the test technique obtained results 87% of students can use Natural Science textbooks based on local wisdom in grade IV elementary school. This study concludes the development of local wisdom-based Natural Science teaching books can be used to improve grade IV Natural Science learning outcomes in elementary schools.

Keywords: Teaching books, and local wisdom

1. Introduction

Natural Science learning is a teaching and learning process to acquire knowledge, skills, and changes in attitude between students and teachers that are planned to achieve the desired goal of mastering the concept of science and understanding the phenomena of natural symptoms that occur (Rogan & Grayson, 2003). Through Natural Science learning, students can gain hands-on experience, so as to add strength to receive, store, and apply the concepts they have learned. Thus, students are trained to discover for themselves a variety of concepts that are thoroughly, meaningfully and authentically learned (Rabanaque et al., 2021).

Natural phenomena that can be studied are a source of learning that students can use in acquiring knowledge. Where the learning resources of Natural Science must be adjusted to the level of student development and accompanied by the curriculum used so as to produce a learning outcome that is in accordance with the standards of complement (Setiawan et al., 2017). Learning resources will be meaningful if designed and packaged with interest so that it can make it easier for students and teachers to use it. Where one form of organizing learning resources is in the form of teaching books.

And basically teaching books are one of the aspects and factors that must be in a learning process because teaching books are a source for teachers and students. Aside from these problems, another problem that is currently developing is the value of local wisdom that has begun to be forgotten by the surrounding community (Karmintoro et al., 2021). Whereas the value of local wisdom has the characteristics of a place. thus we can combine local wisdom with the existence of a teaching book Atmosphere and learning environment conducive to the learning process of Natural Science is very

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diverse, but in the perspective of the context, students will be more appropriate if optimizing the local wisdom of Dewinta et al. (2021).

Based on observations in Public Elementary School No. 2 Karangmangu shows that the learning process that takes place is still centered on teachers. In addition, teaching books in schools still use integrated Natural Science teaching books as usual. This is seen from the availability of books in the library.Students are also less involved in revealing the results of knowledge obtained during learning. This causes students to feel bored in the face of learning, especially in Natural Science subjects. Only 30% of students have the ability to understand Natural Science learning materials based on analysis of students' answers when a written test of the results meets minimum completeness criteria. This shows that students' interest in learning Natural Science is less enthusiastic and interesting and there is a cause of teachers still using simple teaching books so that it is less motivating to learn so as to affect students' learning outcomes.

Based on the above reasons, the researcher aims to develop a teaching book on Natural Science subjects that further highlight learning activities that lead more to the characteristics of Natural Science learning that present local wisdom in the student area, namely Sarang Rembang.

2. Methodology

The development method used in this research is a research and development method called Research and Development (R&D). This research used research design and development with ten steps of implementation referring to Borg and Gall theory. Due to time constraints, researchers only use seven steps to conduct research. Here's the research stage:

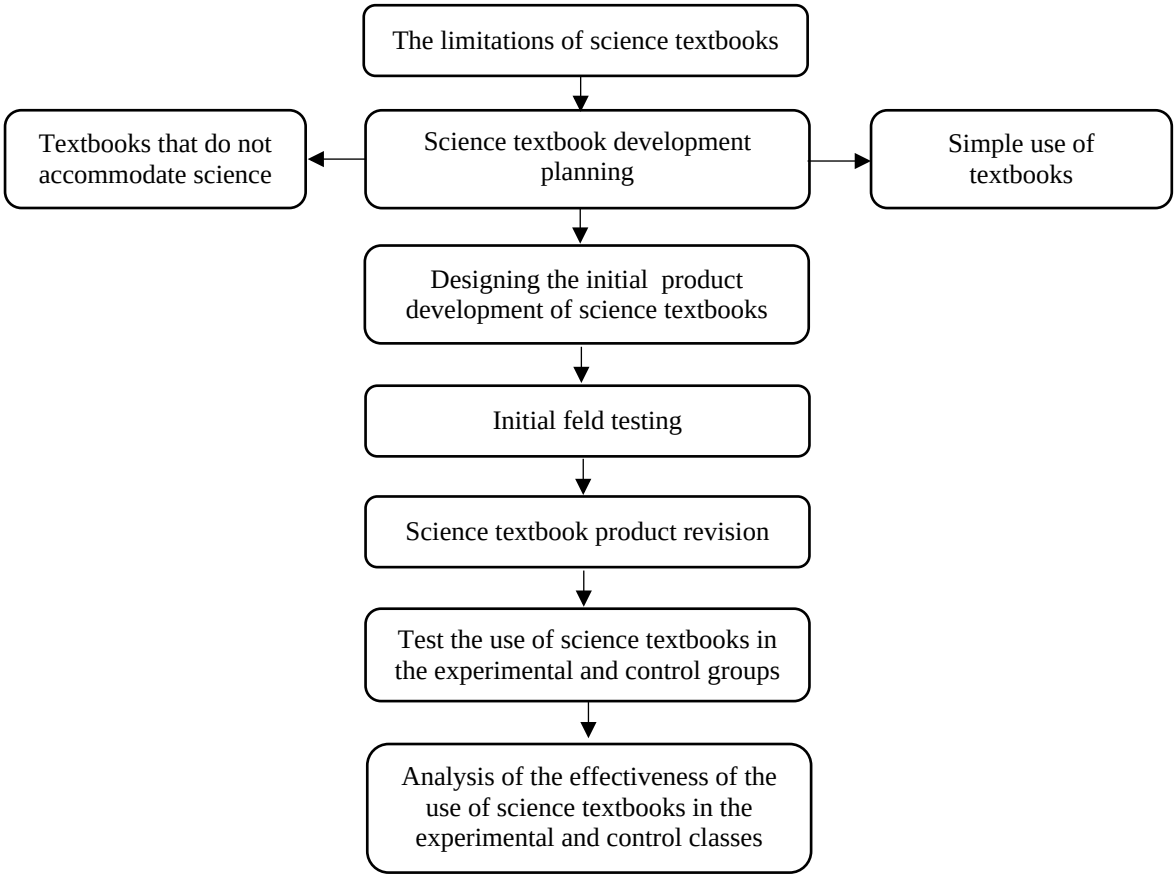

Fig. 1 - Natural science teaching book development model based on local wisdom. According to Borg and Gall in Sugiyono (2017).

In this design, there are two classes used in research, namely the 1st experimental class that is treated using makeshift teaching books and the 2nd experimental class already uses teaching books that have been developed. Both classes are given a pre-test using the same test instrument. Pre-tests are performed to determine the initial state between the control class and the experimental class.

Table 1 - Basic research model.

Class	Pretest	Treatment	Posttest
Control	Y1	X1	Y2
Experiment	Y3	X2	Y4

Description:
X1 : Control class uses only simple and makeshift Natural Science textbooks
X2 : The treatment given to the experimental group is learning that uses the development of Natural Science teaching books
Y1 : Pretest results of student response to Natural Science learning on theme 2 sub themes 1 and 2
Y2 : Posttest results of student response to Natural Science learning on theme 2 sub themes 1 and 2 control classes
Y3 : Pretest results of Natural Science learning student response on theme 2 sub themes 1 and 2 experimental classes
Y4 : Post test results of Natural Science learning student response on theme 2 sub themes 1 and 2 experimental classes.

The population in this study is the fourth-grade elementary school student of the Rembang District's Sarang District. Public Elementary School No. 1 Karangmangu amounted to 5 participants and Public Elementary School Temperak amounted to 5 participants as an experimental class and Public Elementary School No. 2 Karangmangu numbered 10 people as a control class. The instruments in this study consisted of observation sheets, interview guidelines, questionnaires, and test sheets. The analytical techniques used in this research are qualitative data instruments and quantitative data instruments.

3. Results

Based on the development research conducted obtained the following research results:

3.1 Analysis (Analysis)

At this stage analyze core competencies, basic competencies and indicators so that they can produce teaching books that are as simple and in accordance with the curriculum used.

3.2 Design (Product Design)

The next stage in the development procedure of the teaching book is the design which includes the creation of teaching books with energy source materials as the development of Natural Science teaching books in grade IV elementary school researchers do.

3.3 Development Stage

3.3.1 Validation

Expert validation results of product development results in Table 2.

Table 2 - Expert validation results.

Aspect	Criteria	Everage %
Theory	Worthy	90.0
Presentation	Whorty	95.0
Language	Whorty	90.0

In addition to providing an assessment of the validator’s textbooks, they also provide comments and suggestions which are presented in Table 3.

Table 3 - Comments and suggestions from experts.

No.	Suggestions and feedback
1.	Clarified for front writing and writing
2.	The selected to the intent and purpose so that students are more interested in learning it
3.	Prerequisite questions should stimulate student stimuli that can arouse students' curiosity
4.	Local wisdom must be so visible in textbooks
5.	The provision of examples and applications made must be in accordance made must be in accordance with the characteristics of students and are often encountered and up – to date

Based on the questionnaire filled by expert media lecturers scored a score of 13 in the good category with a percentage of 81.25%, it can be concluded that the development of Natural Science teaching materials based on local wisdom in class IV theme 2 sub-theme 1 and 2 is good and can be used by indicators and aspects of content, presentation, and language.

3.3.2 Science Teacher Qualification Test

Based on the average validation results of Natural Science teaching books based on local wisdom for grade IV elementary school, obtained a figure of 90.8% with valid/decent designation.

Table 4 - Test the effectiveness of natural science teaching books.

Aspect	Criteria	Everage %
Theory	Worthy	95.0
Presentation	Whorty	90.5
Language	Whorty	92.0

After the research and development product in the form of teaching books for grade IV elementary school energy source material has been validated by material experts and assessed by Natural Science teachers in grade IV elementary school, then revisions are carried out under validator advice. This validation results in the conclusion that Natural Science textbooks based on local wisdom are worth using in learning grade IV elementary school Natural Science subjects. Upon completion of the revision, the next step of the study is a limited product trial.

The limited trial was conducted on 10 students of grade IV Public Elementary School No. 2 Karangmangu. Of the 10 students, researchers observed student activities using local insecurity-based Natural Science teaching books for energy source material and obtained a score of 86.7 with a very enthusiastic category. Then in conducting a written test, it can be seen in Table 5.

Table 5 - Conducting a written test.

Everage *Pre-test*	Everage *Post-test*	Max score	N-Gain
63.3	75.8	100	0.34

The average increase in N-gain was 0.34 with moderate categories and the observation results of limited trials showed an average yield of 86.7. From these limited tests, Natural Science textbooks based on local wisdom in energy source materials in grade IV elementary school can be used in learning in grade IV elementary school.

After a limited test, a field test is conducted. Field tests are conducted in 3 primary schools. This trial was conducted to test the effectiveness of class IV Natural Science teaching books based on local wisdom to provide energy sources on the theme of 2 sub-themes 1 and 2 of class IV on Natural Science learning. In this field test, researchers used control classes and experimental classes.

Observation results in learning control classes with 3 aspects of assessment, namely enthusiastic attitude towards lessons, interest in Natural Science learning, and activeness of students in control classes. The average observation of learning in class control meeting 1 was 43.0 and 58.0 at the 2nd meeting.

The results of the comparison of written tests of Natural Science learning at the first and second meetings obtained the following results:

Table 6 - Comparison of written tests of meeting control classes 1 and 2.

Meeting	Everage	The Highest Score	Lowest Value
1	43	60	20
2	58	70	20

Based on Table 6, it was obtained an average increase from 43 to 58. Then the researchers calculated the standard deviation of the control class. Derived variant value (S2) 240 and standard deviation (s) 15.49. N-gain in the control class is a 0.26 low category. While in the experimental class researchers conducted student observations in Natural Science learning using a teaching book based on local wisdom for energy source material on theme 2 sub-themes 1 and 2 with the following aspects:

a. Students enthusiastic attitude towards Natural Science lessons on energy source materials that use teaching books based on local wisdom.
b. Curiosity students about teaching books based on local wisdom.
c. Interest in reading and studying and using Natural Science teaching books based on local wisdom.
d. Students can use Natural Science textbooks based on local wisdom.

The results of observations of learning meetings 1 and 2 there is an increase in the average observation of learning as described in Table 7.

Table 7 - Comparison of observation class experiments meeting 1 and 2.

Meeting	Average
1	47.5
2	78

Based on the table of observations of Natural Science learning using teaching books based on local wisdom to find energy sources in the theme of 2 sub-themes 1 and 2 of class IV, it was obtained that the average observation of learning increased to 30.5.

4. Discussion

The results of data processing with the t-test obtained the result of raw deviation (S2) from the standard deviation of the control class and the experimental class so that the result was obtained 68.57. Then the researchers calculated t-count. T calculation obtained t-count result 6.44. In a t-table with df 20 and a = 5% then obtained a value of 2.1. With the results of t-count > t-table, the Natural Science teaching book based on local wisdom in grade IV elementary school is effectively used in learning.

Basically, the development of a teaching book based on local wisdom can make improvements in student learning outcomes in accordance with the target of minimum completeness criteria that has been determined, namely 65. Thus, Natural Science teaching books for grade IV elementary schools based on local wisdom are very valid to be used in the learning process, especially in Natural Science lessons in elementary schools that can make students more active and interesting and can achieve learning goals (Salsabila et al., 2022).

Students will be more interesting and active when using Natural Science teaching books based on local wisdom with research Setiawan, Utomo, & Utaminingsih (2022) show that the development of Natural Science teaching books based on local wisdom can improve student learning outcomes.

In line with the Research conducted by Saputra & Wahyuni (2017) in the title of Development of Natural Science Module Based on Local Wisdom of Puger Coastal Area on The Subject of Transportation System. The results showed that students' learning outcomes were classically completed, the student's environmental caring attitude improved on average from less to good categories after learning using local wisdom-based modules developed and student response towards local wisdom-based modules that are developed positively for all aspects that arise so as to improve student learning outcomes.

Furthermore, students feel more interested in accordance with the research releven by Kumala & Prihatin (2014) entitled of Development of science teaching materials based on local wisdom for grade V elementary school. The results of the study are by using teaching materials based on local wisdom, especially on Natural Science subjects can improve students' understanding in understanding the subject matter that can affect student learning outcomes in 4th grade elementary students.

Student activeness is also in line with research conducted by Widiya, Lokaria, & Sepriyaningsih (2021) entitled of Development of science learning modules based on high grade local wisdom in elementary school in this study has the aim to know the development, feasibility and response of learners and educators to modules on Natural Science lessons based on local wisdom in elementary schools.

5. Conclusion

From the research that has been done, the conclusions that can be obtained are as follows: 1) Natural Science learning requires interesting, easy-to-understand, and fun teaching books, so researchers develop wisdom-based teaching books, 2) teachers should use appropriate teaching books and relevant with student characteristics and environments according to the existing curriculum so that students are easier to understand and interesting to make improvements in student learning outcomes, especially in grade IV Natural Science lessons in elementary school.

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Conflict of Interest

The authors declare no conflicts of interest.

References

Dewinta, A., Nur, F., Sri, S., Imaniar, P., & Tahira, A. Z. (2021). Development of Teaching Material Local Wisdom-Based" Pati" in Elementary School. *Asian Pendidikan*, *1*(2), 59-64.

Karmintoro, Utomo, S., Suad, & Paul, D. C. (2021). The Necessity Analysis of Mind Mapping Based Pocket Book with Materials of Diversities in Indonesia. *Asian Pendidikan*, *1*(2), 23-30.

Kumala, N. K., & Prihatin, S. (2014). Pengembangan Bahan Ajar IPA Berbasis Kearifan Lokal. Seminar Nasional Hasil Penelitian. *Tersedia di http://repo-sitory. unikama. ac. id*, *11*.

Rabanaque, C., Custodio, H., Copello, M., Vilches, A., Legarralde, T. I., & Darrigran, G. (2021). A natural science museum as a resource for teaching and learning. *International journal of zoology and animal biology*, *4*(2).

Rogan, J. M., & Grayson, D. J. (2003). Towards a theory of curriculum implementation with particular reference to science education in developing countries. *International journal of science education*, *25*(10), 1171-1204.

Salsabila, F. 'Ain, Su'ad, & Rondli, W. S. (2022). The Development of Character Education Module on The Beautiful of Diversity Theme in My Country Based on Local Wisdom of Kudus Regency. *ANP Journal of Social Science and Humanities*, *3*, 62-69. https://doi.org/10.53797/anp.jssh.v3sp2.8.2022

Saputra, A., & Wahyuni, S. (2017). Pengembangan Modul Ipa Berbasis Kearifan Lokal Daerah Pesisir Puger Pada Pokok Bahasan Sistem Transportasi Di SMP. *Jurnal Pembelajaran Fisika*, *5*(2), 182-189.

Setiawan, H., Utomo, S., & Utaminingsih, S. (2022). Development of Science Module Based Demak Local Wisdom to Improve Learning Result of Fifth Grade Elementary School Students. *Uniglobal Journal of Social Sciences and Humanities*, *1*(1), 22–28. https://doi.org/10.53797/ujssh.v1i1.4.2022

Setiawan, B., Innatesari, D. K., Sabtiawan, W. B., & Sudarmin, S. (2017). The development of local wisdom-based natural science module to improve science literation of students. *Jurnal Pendidikan IPA Indonesia*, *6*(1).

Sugiyono, P. D. (2017). Metode penelitian bisnis: pendekatan kuantitatif, kualitatif, kombinasi, dan R&D. *Penerbit CV. Alfabeta: Bandung*, *225*.

Widiya, M., Lokaria, E., & Sepriyaningsih, S. (2021). Pengembangan Modul Pembelajaran IPA Berbasis Kearifan Lokal Kelas Tinggi di Sekolah Dasar. *Jurnal Basicedu*, *5*(5), 3314-3320.