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Quality of E-Book Teaching Materials with Scientific Inquiry Approach in Strengthening Science Literacy for Elementary School Students

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ABSTRACT

Keywords:

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Currently the teaching materials used by teachers do not pay attention to the condition of students and their environment, because in general teachers still use conventional teaching materials as a guide in learning. This makes teachers very dependent on conventional teaching materials. This study aims to determine the quality of E-book teaching materials with a scientific inquiry approach in strengthening scientific literacy for elementary school students. This type of research is research and development (Research and Development) using the development model developed by Borg and Gall, and only taken 6 out of 10 overall stages. The subjects in this study were fourth grade elementary school students. The data collection instrument used in this study was a Likert scale questionnaire with qualitative descriptive and quantitative descriptive data analysis techniques. The results of expert validation research show that ebook teaching materials with a scientific inquiry approach can be said to be very feasible by experts according to the indicators of media feasibility, language feasibility, material feasibility. At the small-scale trial stage, the teaching materials developed also received a very good response from teachers and students. Thus the development of ebook teaching materials is expected to be an alternative learning so that concepts in science material can be conveyed properly and can strengthen scientific literacy in fourth grade elementary school students. The results of expert validation research show that ebook teaching materials with a scientific inquiry approach can be said to be very feasible by experts according to the indicators of media feasibility, language feasibility, material feasibility. At the small-scale trial stage, the teaching materials developed also received a very good response from teachers and students. Thus the development of ebook teaching materials is expected to be an alternative learning so that concepts in science material can be conveyed properly and can strengthen scientific literacy in fourth grade elementary school students.



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A. INTRODUCTION

In the current era of progress, human resources are starting to be replaced by new technology, so the skills possessed by humans are rarely needed. Along with student skills, in 21st century education there is a shift in learning that was previously teacher-centered, while learning is now student-centered. The sophistication of technology that occurs today causes a lot of problems, especially in the field of literacy. Scientific literacy is the ability to use scientific knowledge to define problems and draw conclusions based on evidence to understand and make decisions about nature and its behavior and the changes that bring it back to nature through various human activities (Prasasti, 2018). Scientific literacy is one of the important areas of assessment together with reading and mathematics (Udompong & Wongwanich, 2014). Science literacy is knowledge and understanding of scientific concepts and processes needed in making personal decisions, contributing cultural and social activities, and economic productivity (Aswirna & Ritonga, 2020). Science literature describes a person's ability to understand laws, theories, phenomena, and scientific matters (Drago & Mih, 2015).

Currently, the literacy rate of students in Indonesia, especially elementary school students (SD) is very low. The low ability of scientific literacy of Indonesian students is generally caused by learning activities that are not yet oriented towards the development of science literacy (Sutrisna & Anhar, 2020). (Ardianto & Rubini, 2016) revealed that the low scientific literacy is caused by several factors, namely the state of school infrastructure, human resources of school, and school management. Kurnia & Fathurohman, (2014) also revealed that the low scientific literacy ability of Indonesian students is influenced by the curriculum and education system, the selection of teaching methods and models by teachers, facilities and learning facilities, and teaching materials.

Teaching materials are a source of information for students in schools that are very supportive in the learning process. Teaching materials are materials, information, tools/ media that used by lecturers to carry out learning including creating an atmosphere that encourages students to learn (Hendripides & Hikmah, 2018). The form of teaching materials can be printed and non-printed materials. Printed teaching materials may take the form of lecture material, problem solving guides, and learning guides, whereas non-printed teaching materials may take the form of audio, video/ film, or other multimedia required in the learning process. The teaching materials are prepared with the objective of providing materials for learning in accordance with applicable curriculum demands taking into account the needs of students covering the characteristics and environment of the students. Teaching materials can help students find alternative of learning materials in addition to textbooks that are sometimes difficult to understand. As a teacher, you must be able to master technology and be able to understand the needs of students who are developing today. This technology teaching material in the form of an E-book is an innovation to strengthen scientific literacy. Therefore, teachers must be able to develop good teaching materials in a lesson.

Not only that, a teacher must be able to develop teaching materials. The development of teaching materials is able to make learning more fun, effective, efficient, and does not deviate from the goal. Currently, the teaching materials used by students have not been able to foster the ability to search and find themselves. Different levels of understanding of students and limited time to study at school make students less able to study independently in a systematic and directed manner. For this reason, it is necessary to develop an inquiry-based teaching material. By using innovative teaching materials, students are expected to be able to develop their abilities

and be able to solve problems systematically, critically, logically so that they can formulate their own findings with confidence (Kurniawan & Winarsih, 2021).

Based on the results of observations and interviews with fourth grade teachers at Elementary School Pilangbango, the data obtained from the test results daily grade IV students Theme 8 Sub-theme 1 still has not reached the KKM. The KKM used in schools is 75. Of the 20 students, 60% have not reached the existing KKM. This is because (1) learning is less meaningful because it has not provided direct experience to students, so most students tend to be passive when the teacher or explain the subject matter, (2) teachers still use the lecture model but have not applied the learning model with a scientific approach, (3) Learning only uses teacher thematic books and students' thematic books published in the 2013 curriculum. To overcome this, a solution is needed in the form of learning using inquiry-based teaching materials. According to Lahadisi, (2014) Inquiry is a series of learning activities that emphasize the thought process to find or understand information itself. The inquiry learning model applied in learning can foster student curiosity because in this inquiry learning students are required to find their own concepts through discussion and experimentation. In addition, students are also more active in expressing their opinions. For this reason, it is facilitated by using inquiry-based teaching materials.

B. METHOD

This type of research is research and development (Research and Development) or R&D. This research on the development of Scientific Inquiry-based E-book teaching materials in strengthening scientific literacy in elementary school students uses the Borg and Gall development model modified by (Sugiyono, 2015) which consists of ten stages, namely potential and problem analysis, data collection, product design, design validation, design revision, product trial, product revision, usage trial, product revision, and mass production. However, in this study the researchers only developed to the product trial stage. Meanwhile, data on the quality of teaching materials with a scientific inquiry approach in strengthening scientific literacy for fourth grade elementary school students is in the form of the quality of teaching materials developed based on the product (quality of material content, quality of language, and quality of media) and based on users (teachers' responses and student responses). The location of the research was carried out at Elementary School Pilangbango. The test subjects in this study were fourth grade students at Elementary School Pilangbango which consisted of 20 students. To collect data related to this research, researchers used interviews, questionnaires and documentation. Meanwhile, to test the instrument, the researcher used a questionnaire aimed at material experts, linguists, and media experts.

C. RESULTS AND DISCUSSION

The purpose of this study is to describe the quality of E-book teaching materials with a scientific inquiry approach in strengthening scientific literacy in fourth grade elementary school students which were developed based on expert validation results and based on users. The following is a description of each step and the results obtained in each of these research objectives. The quality of the E-book teaching materials with a scientific inquiry approach in strengthening scientific literacy in fourth grade elementary school students can be determined from the results of the device validation. Overall, the tool was validated based on 3 things, namely based on material, language, and media.

The instrument is in the form of a validation questionnaire given to the validator to find out the expert's response to the product developed and then used as the basis for feasibility and

product revision so that the E-book teaching material product with a scientific inquiry approach in strengthening scientific literacy for elementary school students deserves to be tested. Material validation was carried out by a lecturer at PGRI Madiun University, namely Naniek Kusumawati, M.Pd. The results obtained as shown in Table 1.

Table 1. Results of Validation by Material Experts

Rated aspect	Validator Results	Validity percentage
Content eligibility	47	94%

The results of the validation assessment by material experts based on the table above can be concluded that the E-book teaching materials scored 47 while the expected score was 50, so the percentage obtained was 94% in the "very valid" category. The developed e-book has also met several criteria for assessment aspects according to the National Education Standards Agency (in Fahrudin, 2019) namely the suitability of the material with KI, KD, and learning objectives, presenting examples or illustrations to make it easier for students to understand the material, using simple and easy-to-understand language according to the level of students' abilities, using sentences that are not ambiguous and interesting so as to foster student interest in reading and writing, understand the material. The validation of linguists was carried out by Vivi Rulviana, M.Pd who is a lecturer in Elementary School Teacher Education at the University of PGRI Madiun. The results obtained as shown in Table 2.

Table 2. Results of Validation by Linguists

Rated aspect	Validator Results	Validity percentage
Language	44	88%

The results of the validation assessment by linguists based on the table above can be concluded that the E-book teaching materials obtained a score of 44 while the expected score was 50, so the percentage obtained was 88% in the "very valid" category. Media expert validation was carried out by Liya Atika Anggrasari, M.Pd. who is a lecturer in Elementary School Teacher Education at PGRI Madiun University with expertise in educational technology. The researcher prepares the media expert validation sheet which will be filled out by the validator. After that, the researcher calculated how big the percentage was. The results of media expert validation are as follows:

Table 3. Validation Results by Media Experts

Rated aspect	Validator Results	Validity percentage
Presentation	34	68%
Graphics	15	30%
Total		98%

The results of the validation based on the table of assessment results from media experts can be concluded that the E-book teaching materials get a score of 49 while the expected score is 50, then the percentage obtained is 98% with the "very valid" category. Media experts provide suggestions for improving the product of E-book teaching materials. This is also reinforced by statements from media experts who state that the ebook products developed can attract students' attention, increase student enthusiasm during learning, and are easy to use. The developed ebook has also met several criteria for the assessment aspects mentioned by Winarno (in Ernawati, 2017) namely the suitability of the content of the material with the original purpose of making

the media, the presence of additional information such as instructions for use, the attractiveness of the ebook display, navigation/directions, the use of a fun and interactive ebook, ease of access, and evaluation and feedback. Furthermore, the presentation results obtained from the three validators are totaled to determine the overall presentation. The aim is to determine the feasibility of the developed E-book teaching materials. The following is the combined calculation of the three experts, as shown in In Table 4.

Table 4. Combined Percentage of Validation Experts

Expert Rating	Validator Results	Percentage
Linguist	44	88%
Material Expert	47	94%
Media Expert	49	98%
Amount		280%
Combined Percentage Results		93.3%

Product trials were conducted to determine the responses of students and teachers. Student and teacher responses are used to determine the quality of the developed E-book. After testing and calculating the response questionnaire for fourth grade students at Elementary School Pilangbango consisting of 20 students, it can be seen that the score obtained is 1906 while the expected score is 2000. The overall results of the student response questionnaire to the E-book teaching materials reach a percentage of validity of 95.3 % with "Very Good" criteria. This is also reinforced by research developed by Wardani et al, (2021) which states that students learn to use the E-book product developed by the author is very enjoyable, the material learned becomes easier to understand, and the e-book is easy to operate.

While the results of the teacher's assessment include graphic aspects, content feasibility aspects and linguistic aspects. The teacher's results can be concluded that the E-book teaching material product gets a score of 46 while the expected score is 50, then the percentage obtained is 92% with the "very good" category. At this stage the researcher has obtained a product with a reasonable level of accountability.

D. CONCLUSIONS AND SUGGESTIONS

In the E-book teaching material with a scientific inquiry approach, the assessment of the material expert validator on the developed media shows results with the "very feasible" criteria. This is indicated by the percentage of linguistics qualification of 88%. Assessments from media experts also showed positive results and the eligibility criteria were "very feasible" with a percentage score of 98%. Assessments from material experts also showed "very decent" results with a score percentage of 94%. Based on the three validation results above, the average quality level of E-book teaching materials is 93.3%. Student and teacher responses to the product were also very good and included in the "very good" criteria, seen from the results of the small group trial assessment which obtained a score percentage of 95.3% for student responses and 92% for teacher responses.

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