



The Relationship between E-Book Material on Grouping Animals Based on Food Type and the Scientific Literacy Ability of Students in Elementary Schools

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Abstract: The research aims to determine the level of validity and practicality as well as the partial relationship between e-book material on grouping animals based on food type and students' scientific literacy abilities at SDN Rambutan 02, East Jakarta. The research uses mixed research methods, with a quasi-experimental design model and a development model. The instrument trial involved 3 experts, namely media experts, material experts and language experts. Meanwhile, the group trial involved 45 students and 2 class teachers. Data analysis techniques include tabulation of expert validator questionnaire data and teacher and student response questionnaire data. This research shows that the level of validity and practicality of developing e-book-based science teaching materials is very good, and the results of the significance test of the relationship between e-book material on grouping animals based on food type and students' scientific literacy abilities show a t-count of 14.526 with a significance level of 0.000. So, it can be said that there is a significant relationship between the e-book material on grouping animals based on food type and the scientific literacy abilities of students at SDN Rambutan 02, East Jakarta.

Keywords: E-book grouping animals based on type of food; Students' scientific literacy

Introduction

Teaching materials are an important part of delivering education. In education, material is positioned as the initial capital needed or processed to achieve results. This material can be used as a guide for students to develop their skills, a guide for teachers to guide learning activities, and as a learning assessment tool (Ifdaniyah & Sukmawati, 2024; Sukmawati & Zulherman, 2023). Educational materials enable teachers to teach more effectively, serve students better, and facilitate learning. Material can solve or overcome learning problems and difficulties.

The combination of several materials in teaching materials makes it difficult for students to understand them and teachers have difficulty explaining them. These problems can occur because the material is

abstract, complex, or strange. To minimize these obstacles, it is necessary to develop appropriate teaching materials. If the learning material provided is abstract, the use of pictures, photos, diagrams, diagrams, etc. in the material can be useful material to help students explain the summary (Istiqomah & Sukmawati, 2023). To make it easier to understand, complex content should be explained in a way that suits students' thinking abilities. Textbooks are also included in learning materials. Educational materials (learning materials) or learning materials or teaching materials (materials) are understood as educational materials in any form that are used when carrying out learning activities in the classroom by teachers (Ratumanan & Rosmiati, 2019).

Teaching materials themselves refer to all kinds of learning materials that can make the teacher's task of carrying out learning activities easier. This material

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means written or unwritten material. Teaching materials are collected from various learning materials and arranged systematically (Muthi'ah & Sukmawati, 2023). Of course, to create good teaching materials, you need an understanding of the elements contained in the teaching materials. There are seven components of teaching materials that we need to know. These are learning instructions, competencies to be achieved, main content, supporting information, exercises, work instructions or worksheets, and assessments. The characteristics of effective teaching materials, especially those that encourage students to remain active, create a comfortable learning environment, provide comprehensive knowledge and provide direct experience to the students themselves (Prastowo, 2014).

The obstacles found in the world of education, especially in elementary schools, are currently very diverse, books that only contain material, sample questions and questions that lack variety, so they cannot answer students' needs for interesting knowledge, and the results are true examples. The large list of assignments that students must complete makes students feel stressed (Aisyah et al., 2023; Aisyah et al., 2023; Kusnadi & Sukmawati, 2023). The appearance of textbooks and worksheets is less attractive because the contents are not visualized and the paper used is blurry. Apart from that, many students experience misconceptions about the learning they need to do due to a lack of conceptual examples to support their learning process.

Literacy comes from the word literacy which literally means movement to eradicate illiteracy or illiteracy, while the term science comes from the English language Science which means science (Pratiwi et al., 2019). To expedite the learning process, of course we need to utilize technology to create interesting teaching materials and learning media and promote basic skills. Learning media is a tool that makes it easier for students to complete or convey messages conveyed from teachers to students (Arsyad, 2017). One way to develop practical teaching materials is to use them in e-book form.

Although there is a lot of research on the application of instructional materials technology in learning, there are still research gaps that need to be filled. Research regarding the use of information technology in science learning at elementary school level is still very limited. Most research focuses more on higher levels of education or other subjects, so it is unable to foster students' interest in reading more and results in students' scientific literacy abilities becoming lower. In fact, scientific literacy is a very important competency and is an indicator of the quality of education at the international level (Sukmawati et al., 2022).

The results of the Program for International Student Assessment (PISA) survey show that the scientific literacy abilities of Indonesian students are lower than the international average score. Low scientific literacy is caused by many factors, including the learning methods used and the less effective use of technology in learning (Fauziah & Sukmawati, 2023).

One of the new innovations in the world of education is digital books or e-books. E-books are part of technological developments that use computers to display information in the form of text, images, audio, video and other multimedia content in a concise and dynamic format (Ruddamayanti, 2019). Digital books are an evolution of digital printed books and a new innovation in the world of education, offering books that are practical and efficient and can be opened anytime and anywhere (Subiyantoro, 2014). E-books are books published in digital format in the form of text, images and multimedia that can be read on a computer, laptop or other portable electronic device (Tompo, 2017). This material was developed using technology that is useful during online learning during the pandemic. This e-book material is convenient because it can be accessed anytime and anywhere. In terms of content, development must include content that is relevant to the context and appropriate to basic skills. This material has been prepared as best as possible to avoid conceptual, typographical or language usage errors (Nurliana & Sukmawati, 2023; Sukmawati & Wahjusaputri, 2024).

The material Grouping Animals Based on Type of Food contains the knowledge that students need to know about the various types of animals around them. Therefore, visualizing various animal species is important for students to understand the content presented. The modified Borg-Gall model is used to develop teaching materials that are considered suitable for solving misunderstanding problems in science learning, such as the material Grouping Animals Based on Type of Food. By utilizing HTML flipbook software, a flash flipbook application that can convert PDF, Word and PowerPoint files into flipbooks. It is hoped that the development of teaching materials with this software will be useful in solving problems during the learning process.

Illustrated e-book educational materials can convey messages and stimulate students' minds and attention, making them more involved and motivated to learn and encouraging a more enjoyable learning process (Novianti et al., 2023; Sukmawati et al., 2022). Flipbook media is a learning medium in the form of a book in the form of an album in virtual format and contains learning material in sets with colorful columns (Nuryani & Abadi, 2021). This flipbook media aims to be as attractive as possible by combining beautiful and colorful columns so that students have more interest, activeness and

enthusiasm to take part in learning activities (Nuryani & Abadi, 2021). In line with the opinion above, flipbook learning media which is equipped with text, images, animation, video and sound can make flipbooks an interesting learning media (Rahayu et al., 2021).

The problem that arises from this research is that students can become bored if they only study from textbooks. Additionally, most students do not like science classes that include complicated explanations due to the lack of additional materials to support learning. And if the photos or pictures in the textbook are not enough to explain the science material, then the learning explanation will not be optimal.

Research conducted by Monitha et al. (2022), Rusdiana et al. (2022), Sukmana et al. (2022), Wardani et al. (2021), and Yasin et al. (2022) has similarities with research currently conducted by the author. The research of the five previous researchers together discussed the interactive learning media e-books in increasing students' scientific literacy (Fikriyah et al., 2022; Sukmawati et al., 2023). Furthermore, several previous researchers used development research methods in their research such as the SAVI, HOTS and ADDIE approaches.

The difference is that the current research is a combination of quantitative research and development research. The quantitative research method used is quasi-experimental design. To support this research, the R&D development research model is used. This research shows novelty in terms of using mixed research methods to answer existing problem formulations. In the first problem formulation the researcher used a development research method, then in the second problem formulation the researcher used a quasi-experimental method.

This research is important to carry out as reference material for further research to further explore the benefits of using e-books in the learning process so that it can attract students' interest in reading more and increase scientific literacy significantly. From this description, the aim of this research is to find out the level of validity and practicality of e-books as well as the partial relationship between e-book material on grouping animals based on food type and students' scientific literacy abilities at SDN Rambutan 02 Pagi, East Jakarta.

Method

This research uses mixed research methods. Cresswell and Clark, explained that mixed research is research that uses a design with philosophical assumptions and research methods (Fauziah & Sukmawati, 2023). Mixed research as a methodology involves philosophical assumptions to determine the

direction of data collection, analysis and the cultivation of qualitative and quantitative research approaches at the stages of the research process (Samsu, 2021).

This research combines quantitative research and development. The quantitative research method used is a quasi-experimental design (Wanningrum & Sukmawati, 2023). The quasi-experimental design in this research imposes something on the research subjects by using a significance test (t test) of the relationship between e-book content and students' scientific literacy abilities when grouping animals based on food type. Development research or development research models are used to support this research.

The population in this study was all class V students at SDN Rambutan 02 Pagi, East Jakarta, totaling 70 students. The sample in this study was 30 students from class V-A as the control class and 30 students from class V-B as the experimental class, selected for certain reasons (purposive sampling). So the total sample size is 60 students.

The instrument testing in this research was assisted by three experts, namely media, material and language experts. Meanwhile, the group trial involved 30 students and 2 class teachers. Small group trials were carried out on 15 students in class V-A (control class). The large group trial was carried out on 30 students in class V-B (experimental class). Apart from that, trials were also carried out on 2 teachers with the aim of providing responses after using interactive learning media which had been evaluated and tested by experts.

Table 1. Likert Scale for Expert, Teacher and Student Validator Questionnaires

Quantitative analysis	Score
Very good	5
Good	4
Pretty good	3
Not good	2
Very bad	1

Table 2. Eligibility Criteria for Expert Validators, Teachers and Students

Average score	Category
81 - 100	Very worthy
61 - 80	Worthy
41 - 60	Decent enough
21 - 40	Not worth it
0 - 20	Very inadequate

Data collection techniques use interview, questionnaire and documentation methods. Meanwhile, data analysis techniques include tabulation of expert validator questionnaire data and teacher and student response questionnaire data, as well as scientific literacy questionnaires for students. The data analysis method used is a quantitative descriptive analysis method.

Next, to find out and analyze the relationship between e-book material on grouping animals based on food type and students' scientific literacy abilities at SDN Rambutan 02 Pagi, East Jakarta, a significance test or t test was carried out. Under the condition: If the t-calculated value is greater than the t-table value, then the Null Hypothesis is rejected and the Alternative Hypothesis is accepted; If the t-calculated value is smaller than the t-table value, then the Null Hypothesis is accepted and the Alternative Hypothesis is rejected.

Results and Discussion

This research resulted in the creation of a product that is suitable for use in the form of educational material for grouping animals based on food types based on e-books in grade V elementary schools, namely, SDN Rambutan 02 Pagi, East Jakarta. The results of this research are based on validating the feasibility of the design, materials and language, as well as student responses to the results of limited experiments. Presentation of research results developed based on the ADDIE development model, which consists of five development phases including analysis, design, development or production, implementation or delivery, and evaluation (Chang, 2006).

The results of the media expert validation assessment showed a feasibility percentage value of 74.67% in the trial phase and 96.67% in the revision phase. The figure of 96.67% shows that e-book media is very suitable for use as science learning material. The results of the material expert validation assessment showed a feasibility percentage value of 80.00% in the trial phase and 97.50% in the revision phase. The figure

of 97.50% shows that the material in the e-book is very suitable for use as science learning material. The results of the linguist validation assessment showed a feasibility percentage value of 80.00% in the trial phase and 94.00% in the revision phase. The figure of 94.00% shows that the language in e-books is very suitable for use as science learning material. The results of student and teacher response questionnaires are used to find out how students and teachers respond to the products that have been developed. This questionnaire was tested on a small group (15 students), a large group (30 students) and 2 teachers, with the following results.

Table 3. Results of Student and Teacher Responses

Test subjects	Validation %	Category
Small group	85.45	Very worthy
Large group	90.90	Very worthy
Teacher	92.73	Very worthy

The table above shows the percentage value of small group student responses of 85.45% which is included in the Very Eligible category. Then the percentage value of the large group of students' responses was 90.90% which was also included in the Very Eligible category. Furthermore, the percentage value of teacher responses to product development was 92.73%, which means the teacher assessed product development as being in the Very Feasible category.

The results of the significance test (t test) of the relationship between e-book material on grouping animals based on food type and students' scientific literacy abilities at SDN Rambutan 02 Pagi, East Jakarta can be seen in the following table.

Table 4. Significant Test Results for E-Book Material on Grouping Animals Based on Food Type with Students' Scientific Literacy Ability

Model	Coefficients			t	Sig.
	Unstandar dized Coefficients		Standar dized Coefficients		
	B	Std. Error	Beta		
(Constant)	8.712	2.887		3.018	0.005
E-Book Material on Grouping Animals Based on Type of Food	0.834	0.057	0.936	14.526	0.000

a. Dependent Variable: Students' Science Literacy

The significance test table shows a t-count value of 14.526 with a significance level of 0.000. This means that there is a significant relationship between the e-book material on grouping animals based on food type and students' scientific literacy abilities. From this research, it can be seen that the application of e-book material on grouping animals based on food type can improve students' scientific literacy skills in class V at SDN Rambutan 02 Pagi, East Jakarta. This can be seen from the results of trials carried out on the control class and experimental class before and after using e-books in

science learning with the theme of grouping animals based on food type.

Experimental class students who used e-books in science learning with the theme of grouping animals based on food type, had better grades compared to control class students who used textbooks. The use of e-books in learning provides a different atmosphere and attracts students' interest in reading more because the format is simple and interesting and easy to access via cellphone or computer or laptop.

This research is in line with research conducted by Sukmana et al. (2022), where the results of the research showed that the percentage results obtained were media experts 98.86%, material experts 96.00%, and language experts 90.26% and these scores were categorized as very good. Then the product was tested on students with a score of 94.48% in the very good category. Apart from that, students were directed to take the pretest and posttest. The score obtained before using the product was 51 and after using the product, it was 86.5. Based on these results, it can be concluded that e-book teaching materials based on a scientific approach are suitable for use in science learning for fifth grade elementary school.

Then research that is similar to this research is research conducted by Monitha et al. (2022), where the research results show that the suitability of teaching materials is seen based on the assessment of design experts, language experts and material experts. The scores obtained respectively were 81.30% from design experts, 81.53% from language experts, and 91.42% from material experts. Then, students' responses to teaching materials in the form of digital books used in the learning process reached an average score of 0.96 or 96%. From the results of this research, it can be seen that the research produced a teaching material product in the form of a digital book on the subject of Classifying Animals Based on Type of Food in class V of Elementary School. The design validation results show the Very Feasible category, the linguist validation shows the Very Feasible category, and the material validation shows the Very Feasible category. The student response category is included in the Very Good category. Thus, the resulting product is said to be feasible based on the results of student responses and suitable for use as teaching material in the distance learning process.

Conclusion

The first conclusion from this research is that the level of validity and practicality of e-book teaching materials in science subjects with material on grouping animals based on type of food as teaching materials for learning in class V of SDN Rambutan 02 Pagi, East Jakarta using Research and Development is quite high. Where the validation results of media experts obtained a percentage value of 94.67%, material experts with a percentage value of 97.50%, and language experts with a percentage value of 94.00%, with the resulting percentage value being categorized as Very Appropriate for use. The response of students and teachers to e-books is quite high, as can be seen from the response percentage value of small group students of 85.45% (Very Appropriate). Then the response percentage value of large group students was 90.90% (Very Eligible). Furthermore, the percentage value of teacher responses

to product development was 91.72% (Very Eligible). Thus, e-book-based teaching materials are categorized as very suitable in terms of attractiveness. Furthermore, the second conclusion from this research shows that there is a relationship between the e-book material on grouping animals based on food type and the scientific literacy abilities of students at SDN Rambutan 02 Pagi, East Jakarta. Where the tcount value was found to be 14.526 with a significance level of 0.000. This means that there is a significant relationship between the e-book material on grouping animals based on food type and students' scientific literacy abilities.

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Conceptualization, N.A.S, and W.S., methodology, N.A.S, and W.S., validation, N.A.S, and W.S., All authors have read and approved the published version of the manuscript.

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Conflicts of Interest

This research does not have any personal or institutional tendencies.

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