

Development of Ebook Teaching Materials Based on the PBL Model Assisted by the Kvisoft Flibbook Maker Application in Class IV Elementary Schools

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Abstract: This research was conducted because of several findings in the field in the form of technological devices, facilities and infrastructure that are still not being utilized optimally by teachers in the learning process to support interesting and enjoyable learning. E-book teaching material based on the PBL model assisted by the kvisoft flipbook maker application in class IV elementary school which is valid, practical and effective as a solution to overcome the problems found in initial observations. This research activity uses a type of Research and Development (R&D) with the ADDIE (Analysis, Design, Development, Implementation and Evaluation) development model. At the analysis stage, observations and interviews were carried out with teachers and students at three schools, namely SDS IT Dar El Iman, SDIT Sabihisma 1, and SDIT Sabihisma 2, Padang city. At the design stage, a teaching material was designed based on the facts obtained. At the development stage, the teaching material that had been designed was validated to find out whether the product was valid for implementation expert validators (material, language and media) as well as one expert from the FGD teacher so that an overall average validation result of 89.33% was obtained with a very valid category. The results obtained after evaluating the practicality test of the teacher response questionnaire with an average score of 93.30% were in the very practical category and the student response questionnaire obtained an average score of 88.59% which was in the very practical category. In the effectiveness test, the learning outcomes obtained an average score of 91.16 with an N-Gain Score of 67.15%, including the quite effective category.

Keywords: Kvisoft flipbook maker application; PBL model; Teaching materials

Introduction

Education is one of the determinants of the progress and decline of a nation's civilization. Therefore, in this modern era, education plays an important role in creating generations of people who are able to keep up with the pace of scientific development, including the

field of mathematics education (Belbase et al., 2022). One of the important factors in improving human resources is education (Risna et al., 2024). With today's advances in technology, teachers play an important role in creating a learning atmosphere that enables students to think critically and solve problems so that students have

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the skills to face the advancing era of the industrial revolution 4.0 (Septikasari & Frasandy, 2018).

Increasing connectivity, interaction and the development of digital systems are the impact of a world that has entered the era of the industrial revolution generation 4.0 (Amanda et al., 2023). The development of the times and advances in sophisticated technology have an impact on all aspects of life (Wati & Syafriani, 2023). One of the impacts is the impact on the education system in Indonesia. This change cannot be avoided so it is necessary to prepare adequate human resources to be able to compete on a global scale. Human resources can be increased starting from primary and secondary education to tertiary institutions so that they are able to keep up with developments in the Industrial Revolution 4.0 (Lase, 2019).

One of the learning tools that must be considered in the world of education is the curriculum (Fatmawati & Yusrizal, 2020). Every educator uses the curriculum as a reference in implementing the learning process (Putra et al., 2022). Changes or revisions to the curriculum in Indonesia have been made several times so that it can adapt to current developments and advances in technology, the latest change in 2022 using the Merdeka Belajar curriculum which focuses on essential material and the Pancasila Student Profile (Kasli et al., 2022).

So that learning can be realized according to the expected results. The learning process should create a dynamic relationship between students, teachers, and learning materials in an educational environment (Pane & Yeni J, 2023). Several other supporting factors are teachers must care about the methods and thought processes of children until they obtain a result of their own thinking; teachers must provide various activities and methods that result in active students with initiative in themselves; teachers must not emphasize children think like adults; and teachers must care about the speed and level of development of each student so that students can learn optimally (Desyandri et al., 2019; Hairani & Amini, 2023; Silvia et al., 2024).

In accordance with the explanation above, one of the four supporting factors for realizing learning with the expected results is that teachers must provide various activities and methods that result in active students with initiative within themselves (Voskamp et al., 2022). One way to make this hope come true is by developing teaching materials to be more interesting (Davidson et al., 2020). Teaching materials are used as a means of transferring information from teachers to students. Teaching materials are all materials in the form of information, tools, or texts that are completely composed of competencies that will be mastered by students in learning (Husada et al., 2020; Suyasa et al., 2020).

The teaching materials used greatly determine the achievement of each basic competency set (Hernandez-de-Menendez et al., 2020). If the teaching materials prepared do not comply with standards, various problems will arise in learning. In developing teaching materials, there are things that need to be considered, namely that the teaching materials developed are adapted to the needs of students, to the curriculum and character and social environment of students (Prastowo, 2019).

Observations that the author has made at elementary schools consisting of three schools, namely SDS IT Dar El Iman Padang, SDIT Sabihisma 1 and SDIT Sabihisma 2 which were carried out on 3 May 2024 - 4 June 2024 regarding the use of teaching materials. Because one of the determining factors for the success of a learning process is if the teaching materials meet good criteria. Through interviews with class IV teachers and analysis of students' needs, results were obtained in the form of statements from teachers that they did not create teaching modules in implementing learning and when learning to convey teaching materials used by teachers only used books in the form of worksheets, Google on mobile phones and occasionally using infocus so that there are some children whose grades are below the KKTP because the learning is monotonous and there is not enough atmosphere to create an atmosphere that makes students enthusiastic about learning mathematics.

The results of the interview with the SDS IT Dar El Iman homeroom teacher who was interviewed on Friday, May 3 2024, stated that in implementing the learning model, one of the difficulties is readiness for the availability of supporting and adequate facilities. The learning resource used by all children as printed teaching materials is worksheets, which in fact are not enough to use for classroom learning. Because the drawback is that the book design is unattractive so the material is difficult for students to understand.

Likewise, what was conveyed by the homeroom teacher at SDIT Sabihisma 2 on Wednesday, 22 May 2024, was that the learning models he often used in class were discussions, lectures and questions and answers, while variations in problem-based learning models starting from students' daily lives were very important. The difficulty found in implementing the learning model in the classroom is that the classroom atmosphere is sometimes less conducive because the main learning resource used is only worksheets whose design is not attractive to students, such as newsprint with black writing without any colored images. This homeroom teacher hopes that there will be a colorful multimedia book that can be used online (digital) and offline (print).

Meanwhile, what was conveyed by the homeroom teacher at SDIT Sabihisma 1 on Tuesday, June 4 2024,

was that the learning model that he often uses in class is a learning model that is appropriate to the learning material. He also said that the learning model is very important to use for elementary school students in order to stimulate students' intelligence. Then according to him, the learning model that is suitable for use must be in accordance with the conditions of the students in the class. However, the difficulty he found was limited time and learning equipment because at school children were only given worksheets. Meanwhile, teachers use teaching materials from textbooks, the internet and LKS.

The teacher also said that worksheets alone were actually not enough to use when learning in class, there had to be additional learning resources. Even though worksheets have the advantage of having lots of exercises in them, they have the disadvantage that the colors are not attractive because they are only black and white. When asked about his opinion regarding technology-based teaching materials, his answer was very good, for example using infocus is very interesting and fun in learning, especially if you add exercises in the form of games. Even if there is development of teaching materials, the tools and media at the school are available and can be developed according to the material to be taught.

This is certainly not in line with the expectations of the independent learning curriculum where teachers play a role in creating a liberating learning atmosphere that is able to help students to think freely, innovate freely and learn independently and creatively. Apart from that, by only using textbooks, worksheets, Google, and Infocus in learning, students tend to feel bored while learning. Educators should be able to take advantage of technological advances by developing teaching materials that will be used in the learning process.

In the independent learning curriculum, teachers do not only play one role but various roles are carried out by teachers, such as designing learning and implementing and evaluating learning to help students achieve the expected competencies. Just by using books as teaching materials, many students experience boredom in learning (Daga, 2021).

Method

This type of research is development research or R&D. Development research is research to develop products that will be used and not to test theories (Umar et al., 2023). Development research is a systematic study of the design, development and evaluation of learning programs, processes and products which must meet the criteria of validity, practicality and effectiveness (Rustamana et al., 2024). Based on the opinions above, it can be concluded that development research is a process

used to develop and validate products used in education.

The design used in this research refers to ADDIE, with analysis, design, development, implementation and evaluation steps. The ADDIE model is a bridge between students, materials, and all forms of media, technology-based and non-technology (Mufidah & Lestari, 2022). This model assumes that the way of learning does not only use lecture meetings, textbooks, but also makes it possible to combine learning outside the classroom and technology into the lesson material. That is, this model ensures that instructional development is intended to assist educators in developing systematic and effective instruction. This type of development research was chosen because this research develops teaching materials based on the Kvisoft flipbook maker application with a PBL model in mathematics lessons CHAPTER 1 whole numbers in class IV elementary school.

There are 5 steps in developing teaching materials using the ADDIE procedure, the description is as follows:

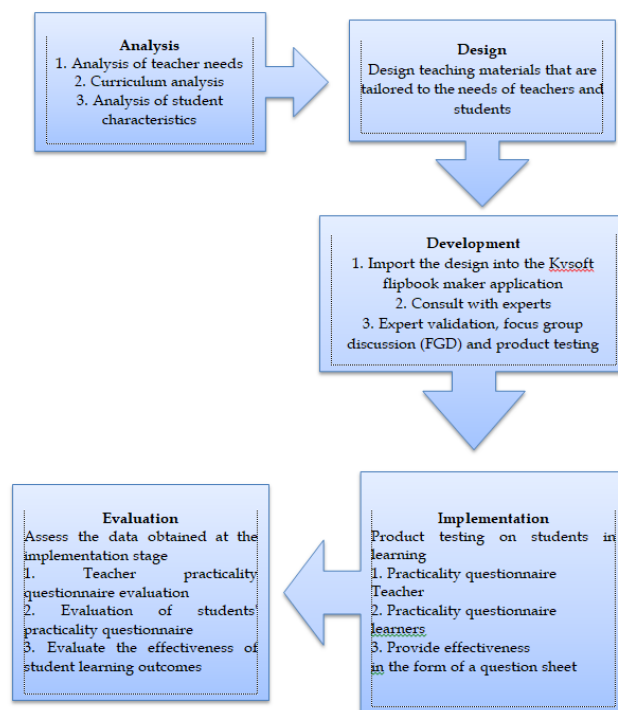


Figure 1. Steps for developing teaching materials

Result and Discussion

Validation of Teaching Materials

The development of ebook teaching materials based on the PBL model assisted by the kvisoft flipbook maker application in class IV elementary schools was validated by four validators consisting of three expert validators from universities and one validator from elementary school who had a master's degree (Hasibuan

et al., 2024; Kharisna & Amini, 2023), where each validator provided assessments and suggestions for improvement to this teaching material.

The validation results on the material aspect obtained an average score of 90.67% with a very valid category. Then the results of validation on the linguistic aspect were 89.33% in the very valid category. Furthermore, validation from the media aspect resulted in 78.67% being in the valid category. Finally, validation from the teacher with a result of 98.67% was in the very valid category.

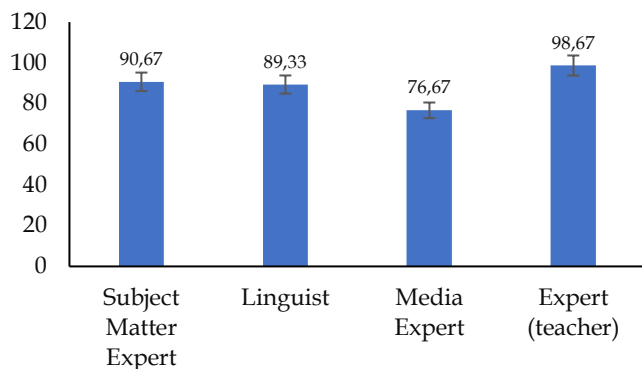


Figure 2. Graphic of Teaching Material Validation Test Results

Focus Group Discussion (FGD)

At this FGD stage, the aim is to provide teachers with an understanding regarding the teaching materials that have been designed after being validated by three expert validators from universities and one validator from an elementary school who has a master's degree. When the FGD discussed how to use teaching materials. Then the teachers in this FGD were given an open assessment sheet containing three questions regarding the obstacles encountered in the teaching material product, the obstacles encountered in the product application process, and suggestions for this teaching material product (Sudirman et al., 2023). The FGD participants did not find any problems with this product. However, product application takes time. Likewise, the suggestions given should be shared with schools because this is something new for them and interesting for students.

Product Trial

This product testing stage was carried out after validation and FGD. This product trial was carried out at SDS IT Dar El Iman with a total of 27 students and a class teacher by providing teacher and student response questionnaires along with question sheets for the pre-test and post-test. The average result from the teacher response questionnaire was 100% in the very practical category. Then the average response from the student

questionnaire was 94.53% with the very practical category.

When giving pre-test questions, the average student score was 78.07, with 13 students getting scores below the KKTP. After being given learning using mathematics ebook teaching material products based on the PBL model assisted by the kvsoft flipbook maker application, the average posttest score was 94.81 and none of the overall scores were below the KKTP.

Implementation

This implementation stage is carried out after the teaching materials are declared valid and have been tested. This implementation was carried out in two schools, namely SDIT Sabihisma 1 and SDIT Sabihisma 2 with a total of 48 students and two class teachers. The application of this product is carried out in each school on different days. Students are divided into three groups and teaching materials are displayed in front of the class via an infocus projector using a laptop. The following is an explanation of the implementation stage:

Distribute practicality questionnaires

This practicality questionnaire was distributed at the end of the lesson. This practicality response questionnaire was given to teachers and students to find out the practicality of the teaching materials used. The questionnaire distributed to teachers and students contained five aspects including the practicality aspect of use with 4 questions, the time efficiency aspect with 1 question, the suitability aspect of illustrations with 1 question, the language aspect with 2 questions and the evaluation aspect with 3 questions.

Giving questions

Giving questions aims to measure the effectiveness of teaching materials after use. The questions prepared consist of 25 questions consisting of multiple choice questions. The questions prepared include questions about mathematics regarding whole numbers which are guided by operational verbs that are appropriate for the HOTS question level, so that the questions done by students can be done accurately and correctly.

Evaluation

At this evaluation stage, all data obtained at the implementation stage is assessed to see the practicality and effectiveness of the teaching materials after being used in the field (Ratnawati et al., 2023). Starting from teacher response questionnaires, student response questionnaires, and question sheets.

Evaluation of Teacher Response Practicality Questionnaire

The results of the practicality questionnaire evaluation of teachers' responses to teaching materials

using a problem based learning model based on the kvisoft flipbook maker application at SDIT Sabihisma 1 and SDIT Sabihisma 2 obtained an average practicality of 93.2%. So it can be concluded that the practicality of this teaching material is in the very practical category.

Evaluation of Student Response Practicality Questionnaire

Apart from distributing questionnaires to teachers, researchers also need responses from students by distributing questionnaires, the average overall aspect score is 88.59%, which is included in the very practical category.

Evaluation of the Question Sheet

The criteria for achieving learning objectives (KKTP) at the two schools apply the number 80, meaning that if students get a score ≥ 80 then they can be declared successful on that topic. The following is a recapitulation table for each school regarding student learning outcomes which can be used as a reference to see whether the teaching materials developed are effective for application in the learning process.

Based on Table 1, it can be concluded that the average learning outcomes of students in learning

mathematics with whole number material from SDIT Sabihisma 1 is 92.60 and SDIT Sabihisma 2 is 89.71. The total average of the two elementary schools is 91.16. So it can be concluded that the mathematics ebook teaching material based on the PBL model assisted by the Kvisoft flipbook maker application is effective for use in the learning process.

Table 1. Recapitulation of Student Learning Outcome Values

School	Amount of students	Average
SDIT Sabihisma 1	20	92.60
SDIT Sabihisma 2	28	89.71
Average		91.16

N-Gain Score

The effectiveness test was obtained using pre-test and post-test instruments, namely before and after using teaching materials developed in the learning process (Fatimah et al., 2024). The following is data on the Pre-test and Post-test results for both schools based on the N-Gain Score results which can be seen in the Table 2.

Table 2. Result of N-gain Pre-Test and Post-Test

School	Average of Pre-test	Average of Post-test	N-gain score	Category	N-gain score (%)	Category
SDIT Sabihisma 1	73.94	92.60	0.70	Effective	70.19	Effective
SDIT Sabihisma 2	72.04	89.71	0.64	Medium	64.10	Quite Effective
Total	145.98	182.31	1.34		134.29	
Average		91.16	0.67	Medium	67.15	Quite Effective

It can be seen that there is an increase in student learning outcomes before and after using teaching materials developed based on the Kvisoft flipbook maker application. The pre-test score results were obtained with an average of 72.99. Meanwhile, the average post-test result obtained was 91.16 in the medium category. Meanwhile, for the N-Gain score, an average value of 0.67 was obtained with a percentage of 67.15%, which means that mathematics ebook teaching materials based on the PBL model assisted by the Kvisoft flipbook maker application are quite effective in improving student learning outcomes (Nurhidayati et al., 2024).

Conclusion

The research carried out is development research using the ADDIE (analysis, design, development, implementation, evaluation) model with the title of developing mathematics ebook teaching materials based on the PBL model assisted by the Kvisoft flipbook maker application in class IV elementary schools. This teaching

material product was developed on the material CHAPTER 1 whole numbers. Based on the process and results of the research, it can be concluded that: there is a process for developing mathematics ebook teaching materials based on the PBL model assisted by the Kvisoft flipbook maker application in class IV elementary schools which is well prepared starting from needs analysis, designing teaching materials, developing teaching materials, implementing teaching materials, and evaluating the results of teaching materials; there is development of mathematics ebook teaching materials based on the PBL model assisted by the Kvisoft flipbook maker application in class IV elementary schools which is very valid with an average of 89.33%; there is development of mathematics ebook teaching materials based on the PBL model assisted by the Kvisoft flipbook maker application in class IV elementary schools which is very practical with an average of 93.30% and 88.59%; there is development of mathematics ebook teaching materials based on the PBL model assisted by the kvisoft flipbook maker application in class IV elementary

schools which is quite effective with an average score of 91.16 and an N-Gain Score result of 67.15%.

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In writing this article, the authors do not have any conflict of interest.

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