The Effectiveness of Digital Book Learning Media Through the Kvisoft Flipbook Application Based on Problem Solving in Elementary Science Subjects

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Abstract. This research is based on the problem of students' mastery of elementary science subjects in grade 4 with energy materials. The purpose of this study was to measure the effectiveness of the Digital Book Learning media through the Kvisoft Flipbook Application Based on Problem Solving (PBL) in Elementary Science Learning. The method used is quantitative analysis of 4th grade elementary school students. The results showed that the results of the HOTS posttest were in the high category. minimum mastery achievement can be achieved by a minimum of 65% of students. The time used in learning is efficiently used and when teaching takes place there is interaction between students and teachers or between students. Students respond positively and are interested in digital book learning media using kvisoft flipbook using a problem solving approach so that it can be said to be effective.

Keywords: Digital book, Kvisoft Flipbook, PBL

1 Introduction

The direction of science learning is to find out about nature systematically, so that science is not only a mastery of a collection of knowledge in the form of facts, concepts, or principles, but also a process of discovery and the formation of scientific attitudes.[1] Science learning also includes two important things, namely terminology and concepts that are expected to help students understand natural phenomena.[2] Although it is realized that the weakness of science learning is caused by the technique or learning model used by the teacher which emphasizes the memory factor.[3] This weakness is also found in grade 4 of the School MIN 3 Medan which has used smartphone technology in learning science subjects but still gets unsatisfactory grades.

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[1] Tursinawati. *Analisis Kemunculan Sikap Ilmiah Siswa Dalam Pelaksanaan Percobaan Pada Pembelajaran IPA Di SDN Kota Banda Aceh*, Jurnal Pionir, (2013), 1(1), p. 67-68

[2] Hasruddin., Nanda, P., & Harahap, F. *The Development of Problem-Based Applied Microbiology Textbook*, International Journal of Education and Research, (2014), 2(9), p.187.

[3] B.Muakhirin. *Peningkatan Hasil Belajar IPA Melalui Pendekatan Pembelajaran Inkuiri Pada Siswa SD, Jurnal Ilmiah Guru* "COPE" (2014), 1(1), p. 51.

This is because learning media through smartphones used by teachers seem less attractive to students. There needs to be another approach in delivering the message of science subjects. Through the use of digital books or e-books can be used by reading on a desktop or laptop screen, PDA or other portable devices, or on e-book reader hardware. It can also be used through various file formats and can incorporate other features, such as annotations, audio and video, and hyperlinks.[4]

Based on initial observations made to grade 4 MIN 3 Medan, it was shown by the homeroom teacher for class IV which explained that some of the students still got scores below the minimum passing criteria (KKM) in science subjects with energy materials. Only 6 of the 28 students completed. If it is calculated in percentage form, only 21.42% of students who complete, while those who do not complete it, reach 78.58%. The minimum completeness criteria (KKM) that has been determined by MIN 3 Medan is 6.5. It is relevant if one of the software that can be used to produce digital books is through kvisoft flipbook. The kvisoft flipbook application is an application that supports learning media that will help in the learning process because this application is not only focused on writing but can include motion animations, videos, and audio that can make interactive learning media interesting so that learning be not monotonous. To note that the purpose of using media in general is to facilitate communication.[5] In simple terms, the consideration of media selection has a basis, namely meeting learning needs and helping to achieve the desired goals. As for the things that need to be considered in the selection of media, namely: instructional objectives, student characteristics and targets, the type of learning stimulation desired, namely through audio, visual. motion, and so on), environmental conditions, local conditions, and the breadth of the range to be served.[6] So digital books using the kvisoft flipbook application can be accessed offline and do not have to spend a lot of money because they are in the form of soft files.[7] In this way, the effectiveness of science lessons can be implemented and can be measured.

2 Research methods

Data from the test results of students' higher order thinking skills using a digital book through kvisoft flipbook will be analyzed quantitatively to determine the improvement of students' higher order thinking skills after the learning is carried out. Indicators of students' higher order thinking skills which will be developed into thinking ability tests.

2.1. Indicator Table

Table 1. Indicators of Students' Higher Order Thinking Ability

[4] Muhammad, M. Rahadian, D., R. E. Safitri., *Penggunaan Digital Book Berbasis Android Untuk Meningkatkan Motivasi Dan Keterampilan Membaca Pada Pelajaran Bahasa Arab*, PEDAGOGIA Jurnal Ilmu Pendidikan, (2018),15(2) p.171.

[5] Wina Mariana Parinduri, *Perbaikan Pembelajaran Dengan Metode Blended Learning Mengginakan Aplikasi Video Conference Zoom Meeting Dan Whatsapp*, Jurnal Sintaksis: Pendidikan Guru Sekolah Dasar, IPA, IPS dan Bahasa Inggris. (2022), 4(1).p. 45.

[6] M,Harahap & LM. Siregar. *Mengembangkan Sumber dan Media Pembelajaran*, January (10), (2018).

[7] Wibowo & Pratiwi.,*Pengembangan Bahan Ajar Menggunakan Aplikasi Kvisoft Flipbook Maker Materi Himpunan*, Desimal: Jurnal Matematika,(2018), 1(2). p.149.

No	Aspects of Students' Higher Order Thinking Ability Measured indicators	Measured indicators
1	Analysis (C4)	At the level of analyzing, students will be more emphasized on how to think critically operationally. Analyzing consists of the ability or skill to distinguish (differentiating), organize (organizing), and connect (attributing). The operational verbs that are commonly used are compare, critique, sort, differentiate, and determine.
2	Evaluation (C5)	Evaluating means making decisions based on standard criteria, such as checking and criticizing. The Operational Verbs used are evaluating, selecting / selecting, assessing, refuting, and giving opinions.
3	Creation (C6)	The ability of students to design, build, plan, produce, discover, update, perfect, strengthen, beautify, compose. Operational Verbs used are clarify, interpret, predict.

Based on these aspects and indicators, a test grid will be compiled which will then be developed into a test of students' higher-order thinking skills and appropriate scoring guidelines. Before being tested, the questions are validated by experts and then the validity and reliability are determined. After being valid and reliable, the questions were tested on students who were the research subjects.

Analysis of students' classical mastery is done by calculating: (1) the results of the posttest of students' higher order thinking; (2) the achievement of complete learning objectives (at least 75% of the formulated learning objectives can be achieved by a minimum of 65% of students); (3) the time used in learning is efficient or does not exceed ordinary learning; and (4) students responded positively to the components of the digital book learning media using the kvisoft flipbook using the problem solving approach that was developed.

2.1.1 Test Validity Test of Students' Higher Order Thinking Ability

Validity relates to the accuracy of the measuring instrument against the mastery of the concept being measured so that it actually measures what it is supposed to measure. The formula used to calculate validity is the product moment correlation formula[8], namely:

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\left\{\sqrt{(N(\sum X^2) - (\sum X)^2) \times (N(\sum Y^2) - (\sum Y)^2)}\right\}} \tag{1}$$

Information: r_{xy} = correlation coefficient between variables X and Y
X = each student's i-item score
Y = total score of each student
N = many samples

To determine whether a test item is valid or not, the correlation coefficient value is compared with the critical value of the Product Moment r table, with a significant level of 5%. Arikunto

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[8] Arikunto, *Prosedur Penelitian (Suatu Pendekatan Praktek)*. Jakarta: Rineka Cipta. (2006). p.13.

(2006) suggests "if r*count* > r*table* then the question is said to be valid, but if r*count* < r*table* then the question is said to be invalid". Determination of the validity of the test items can also be done using SPSS 22. Interpretation based on the correlation coefficient value of the validity of the items is presented in Table 2 below:

Table 2. Interpretation of Validity Correlation Coefficient [9]

Koefisien Korelasi	Interpretasi
$0,80 < r_{xy} \leq 1,00$	Very strong
$0,60 < r_{xy} \leq 0,80$	Strong
$0,40 < r_{xy} \leq 0,60$	Enough
$0,20 < r_{xy} \leq 0,40$	Low
$r_{xy} \leq 0,20$	Very low

2.1.2. Reliability Test of Students' Higher Order Thinking Ability Test

Reliability shows the consistency and stability of a score or measurement scale. Reliability differs from validity because the former focuses on the issue of consistency, while the latter focuses more on the issue of accuracy. An instrument is said to be reliable if a person's answer to a question is consistent or stable over time. In the reliability test, the Cronbach alpha formula (Arikunto, 2012) is used, namely:

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum \sigma_b^2}{\sigma^2{}_t}\right) \qquad (2)$$

Information: r_{11} = instrument reliability
          k = the number of questions
          $\sum \sigma_b^2$ = number of item variances
          $\sigma^2{}_t$ = total variance
The level of reliability of the spatial ability test questions using interpretations is as follows:

Table 3. Interpretation of Spatial Ability Reliability Level

Reliability Coefficient	Interpretation
$0,00 \leq r_{11} \leq 0,20$	Small
$0,20 < r_{11} \leq 0,40$	Low
$0,40 < r_{11} \leq 0,70$	Currently
$0,70 < r_{11} \leq 0,90$	Tall
$0,90 < r_{11} \leq 1,00$	Very high

If the alpha value is 0.70 or more, it is said that the item provides a sufficient level of reliability, on the contrary, if the value is taken to 0.70, it is said that the item is less reliable.

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[9] Arikunto, S. (2012). Prosedur Penelitian Suatu Pendekatan Praktek. Jakarta: Rineka Cipta.

3 Results and discussion

3.1. The Effectiveness of Digital Book Learning Media using Flipbook Based on Problem Solving in Science Learning Material Energy for Grade IV Students of MIN 3 Medan

3.1.1 Student Mastery Level

From the post-test score data on student learning outcomes, each student is determined by the Percentage of Student Mastery (PPS) of learning outcomes, which can be seen in Table 4.21 below:

Table 4. Description of Student Mastery Level

Mastery Level of Students	Mastery Level	number of students	Percentage Number of students
90% $\leq K \leq 100\%$	Very high	1	3,33%
80% $\leq K \leq 89\%$	Tall	14	46,67%
65% $\leq K \leq 79\%$	Currently	14	46,67%
55% $\leq K \leq 64\%$	Low	1	3,33%
0% $\leq K \leq 54\%$	Very low	0	0%

Based on Table 4. above shows that obtained 1 student with a percentage of 3.33% very high level of mastery, 14 students with a percentage of 46.67% of a high level of mastery, 14 students with a percentage of 46.67% of a moderate level of mastery, 1 students with a percentage of 3.33% low mastery level. It can be interpreted that the criteria for the level of student mastery are classically included in the high category.

3.1.2 Student Learning Mastery

Data on student learning mastery on the subject of energy changes can be seen in Table 5. below:

Table 5. Students' Learning Completeness Levelsa

Information	Amount	Percentage
Students who have finished studying	29	96,67%
Students who do not finish studying	1	3,33%

From the results of Table 5. above, it can be said that classical learning completeness is 96.67% or as many as 29 students from 30 students who score above 65 or obtain a minimum score of 65. Based on the criteria for mastery learning if there are 75% students in the class which achieves absorption of 65%, the classical mastery of learning has been fulfilled.

3.1.3 Time Used in Efficient Learning

During the teaching and learning process, there must be interaction between students and teachers or other students. The better student interaction can accelerate the learning process and improve student learning outcomes, so as to achieve the expected goals. Therefore, the time in

the teaching and learning process should be used as much as possible. This can be seen in Table 6. below:

Table 6. Results of Time Used in Efficient Learning

Aspect	Overall Value	Percentage	Category
Paying Attention and Listening to Master's Explanations	552	23,38%	Effective
Reading and Understanding problems in Learning Media or LKPD	572	24,23%	Not Effective
Finding Solutions and Resolving Given Problems	384	16,26%	Not Effective
Discuss and Ask Teachers or Friends	302	12,79%	Effective
Drawing conclusions from the material studied	318	13,47%	Effective
Doing Activities Not Relevant to Learning	233	9,87%	Effective

Based on Table 6. above shows that the acquisition of time used in learning, aspects of paying attention and listening to teacher explanations with an average percentage of 23.38% with effective categories, on aspects of reading and understanding problems in learning media or LKPD obtained a percentage of 24 ,23% in the ineffective category, the aspect of finding solutions and solving the given problem obtained a percentage of 16.26% with the ineffective category, the aspect of discussing and asking the teacher or friends obtained a percentage of 12.79% with the effective category, the aspect of drawing conclusions From the material studied, a percentage of 13.47% was obtained in the effective category, and aspects of carrying out activities that were not relevant to learning obtained a percentage of 13.47% in the effective category. This means that the time used in developing digital book learning media using problem solving-based flipbooks for class IV students of MIN 3 Medan is effectively used for class IV students of MIN 3 Medan.

3.1.1. Student Response to Digital Book Learning Media using Flipbook Based on Problem Solving

Seeing student responses to digital book learning media using kvisoft flipbook using a problem solving approach can be shown in Table 7 below.

Table 7. Student Response Results

Aspect	Criteria	Total Score	Rs	Average score per aspect	Category
Content Quality	1	108	4,00	3,98	Interested
	2	114	4,22		

Aspect	Criteria	Total Score	Rs	Average score per aspect	Category
	3	108	4,00		
	4	108	4,00		
	5	114	4,22		
	6	102	3,78		
	7	96	3,56		
	8	108	4,00		
	9	108	4,00		
language	10	108	4,00		
	11	102	3,78	3,85	Interested
	12	102	3,78		
Media Display Eligibility	13	102	3,78		
	14	108	4,00		
	15	114	4,22		
	16	108	4,00		
	17	108	4,00		
	18	102	3,78	3,91	Interested
	19	108	4,00		
	20	102	3,78		
	21	108	4,00		
	22	96	3,56		
Ease of Use	23	108	4,00		
	24	102	3,78		
	25	108	4,00	3,96	Interested
	26	108	4,00		
	27	108	4,00		
Total Average				15,69	
Average overall score				3,92	
Criteria				Interested	

Based on Table 7. above, it shows that the average acquisition of student responses is 3.92 in the interested category. The quality aspect of the content with an average percentage of 3.98 with interest, in the linguistic aspect a percentage of 3.85 was obtained with interest, the media display feasibility aspect obtained a percentage of 3.91 with the interested category, and the ease

of use aspect obtained a percentage of 3. 96 with interested category. This means that students' responses in developing digital book learning media using problem solving-based flipbooks for grade IV students of MIN 3 Medan have almost all activities carried out and get positive responses and are interested in using them.

4   Conclusion

So it can be concluded that the digital book learning media using problem solving-based flipbooks in science learning material energy for grade IV students at MIN 3 Medan is effective with: the results of the posttest of students' higher order thinking obtained the criteria for classical student mastery levels included in the high category; the achievement of complete learning objectives (at least 75% of the formulated learning objectives can be achieved by a minimum of 65% of students) have been met; the time used in learning is efficiently used and when teaching takes place there is interaction between students and teachers or other students; and students responded positively and were interested in the components of the digital book learning media using flipbooks using a problem solving approach.

4.1 Suggestion

As the current digital era develops, it is hoped that educators must continue to innovate to find better learning methods to facilitate student learning. The feasibility of Digital books will trigger student activity, and the application of Digital book materials through Kvisoft Flipbook in learning is very effective in developing students' critical thinking skills. For teachers to use Digital books through Kvisoft Flipbook as learning materials for science students. Because the Digital book through Kvisoft Flipbook is only equipped with critical thinking exercises, teachers need to develop evaluation tools to measure students' understanding. Digital books through Kvisoft Flipbook can be used not only as independent learning media, but also as group learning media.

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