Development Mind Mapping-Based Pocket Book Learning Media to Improve Student Learning Outcomes

Nurul Hidayati Sakinah*¹, Lia Yuliati², Candra Utama³
Universitas Negeri Malang, 05 Cakrawala Street, Malang
e-mail:**nurul.hidayati.2021037@students.um.ac.id**

Abstract. The aim of the study was to produce a pocket book based on mind mapping for grade IV elementary schools on the theme of always saving energy which was tested for a valid level in terms of expert validation, interesting in terms of student response questionnaires and effective in terms of pre-test and post-test. Experiments were carried out using non-equivalent control group design and using a research and development model with a 4D development model including Defining, Designing, Developing and Deploying. Data collection using the method of observation, questionnaires, interviews and documentation. The results of this research, it can be said that the category is very valid, very interesting and the post-test score is greater than the pre-test score. The use of pocket book learning media based on mind mapping can improve student learning outcomes grade IV.
Keywords. Learning Outcomes; Pocket Book; Mind Mapping; Thematic Learning

INTRODUCTION

Thematic learning is integrated learning that combines several subjects using themes in one meeting. One way that can be used to develop students' knowledge is through learning media so that the knowledge obtained and studied can be received optimally (Yusrina, 2018). Thematic learning really needs learning media. Teaching process activities require learning media. The learning process requires learning media because it will make it easier for the teacher to convey the material explained to students. The use of learning media can help students understand various materials, especially broad material. Learning media is a tool used to help students in the learning process which serves to clarify the meaning to be conveyed, so that what is conveyed can achieve even better educational goals (Padmasari et al., 2021).

An effective and efficient learning process can use learning media so that the delivery of messages can be carried out properly (Risnawati et al. 2018). The learning media used must be fun and interesting and appropriate to the material to be delivered. Learning media has various types so that it can help educators and students. Arshad 2017classify the media in several types: (1) Examples of print media, textbooks, newspapers and brochures. (2) Display media such as blackboards, diagram boards, magnetic boards etc. (3) Overhead transparencies (OHP), in the form of characters, symbols, combinations and graphics. Books are the most common print learning media.

The characteristics of the textbooks are that they follow the current national education curriculum, are skill-oriented, contain pictures and attract students' interest

The instructional media developed in this study are material books based on the curriculum. This research develops a pocket book based on mind mapping. Pocket books are learning media that are included in print media(Hujair, 2013). A pocket book in the form of a small book that is lightweight can be carried in a pocket and is easy to carry and read anytime anywhere(Lena et al., 2020). This is reinforced by the meaning of the pocket book according to Rifandi et al., (2021) which states that a pocketbook is a small book that can be put in a pocket and can be taken anywhere. While Mind mapping is a way to make it easier for people to understand something (Areisty et al., 2020). Mind maps are in the form of interesting branches with material that is more clearly visible in the picture. Mind mapping is a creative method that can be used for learning(Swestyani et al., 2018). Creativity in mind mapping aims to make students focus on class topics and not be boring for students but become interesting and useful topics (Nasrabad & Alimondegari, 2019). Based on the discussion above, mind mapping-based pocket books are small-sized textbooks that make it easier for students to learn by using route maps and hone brain performance. By using a student route maps it is easier to memorize and understand. In this study, data were collected from 3 schools, namely SDN Tanjung II Pamekasan, SDN Tanjung IV Pamekasan and SDN Padelengan 1 Pamekasan.

The results of observations made at Tanjung IV Pamekasan Elementary School show that when learning begins, there are students who are not interested in learning, there are students who feel bored, there are students who like to talk to their friends and there are some students who do not understand the material because the learning resources used have not varies. The learning resources used were only books from the school and had not used other supporting learning resources as well as at SDN Tanjung II it was found that students had difficulty understanding the material, students felt bored when studying and at SDN Tanjung II Pamekasan school there were only two learning sources, namely books the one from school and the picture pasted on the blackboard. At Tanjung IV Pamekasan SDN and Tanjung II Pamekasan SDN it was found that several students were only silent when asked questions by the teacher during apperception at the beginning of the lesson because they forgot about the material being taught.

Likewise, at SDN Padelegan 1 Pamekasan, it was found that several students were still talking to themselves when learning started and the media at this school was only based on student books and some pictures made by the teacher. The results of data from students obtained information that some students were less enthusiastic when learning because of the minimal use of media in learning and the lack of interest in the media, and when there were questions from the teacher some students had difficulty answering questions and remembering the material.

The use of mind mapping-based paperback media improves learning outcomes and the ability to comprehend student content, making learning more meaningful, especially for students (Sustainable & Komariah, 2020). Learning outcomes are what students experience after they learn. According to the statement (Nugraha et al., 2018)learning

outcomes is a measure of student success in achieving certain goals through learning. The media used is based on mind maps, making it easier for students to learn and can make students think critically compared to existing media which are only pocket books without mind maps.

METHOD

The method used uses a development approach with research and development methods. Data analysis in this study uses the 4D development model developed by Thiagarajan according to (Ramansyah, 2018). The product trial design consists of expert validation trials, small group trials and large group trials. The data collection techniques used were observation, interviews, questionnaires and documentation. A quasi-experimental non-equivalent control group design was used in this study to compare the mind mapping-based pocket book learning media used in the experimental class, while the Handout learning media was used in the control class. The study period was carried out for 2 weeks starting from July 25 to August 10, 2022. The flow of development of Thiagarajan according to (Ramansyah, 2018) consists of four stages, namely Define, Design, Develop, and Disseminate in Table 1.

Table 1 Procedure for Developing Pocket Book Learning Media Based on 4D Mind Mapping

No	Stages	Description
1	*Define*	a. Final initial analysis (Observation)
		b. Student analysis
		c. Concept Analysis
		d. Task Analysis
		e. Analysis of Learning Objectives
		f. Initial draft
2	*Design*	a. Test Preparation
		b. Media Selection
		c. Forming
		d. Initial draft
		e. Prototype
3	*Develop*	a. Expert Validation
		b. Validation results
		c. Analysis
		d. Valid
		e. Test ex. small
		f. Test ex. Big
		g. The final product
		h. Testing Comparing the final product with the control class, namely

		Handout
4	*Disseminate*	a. The final product is a pocket book media based on mind mapping that is used at SDN Tanjung IV Pamekasan, SDN Tanjung II Pamekasan.

Source:(Ramansyah, 2018)

RESULTS AND DISCUSSION

The use of mind map-based pocket book learning media is considered to help improve student learning outcomes. Before use, this media is tested for validity. The mind mapping-based pocket book validity test is carried out by experts in their field. The following is Table 2 of the validity test results.

Table 2. Media validity test

Validation	**Results**
Learning Design Expert	$V - ah = \frac{30}{32} \times 100\%$ $=94\%$
Materials Expert	$V - ah = \frac{44}{48} \times 100\%$ $=92\%$
Learning Media Expert	$V - ah = \frac{50}{60} \times 100\%$ $=83\%$
Linguist	$V - ah = \frac{26}{28} \times 100\%$ $=92\%$

The next stage was tested in the control class and experimental class. Based on the normality test, the distribution of data in the experimental class and control class was declared normal with a significance value of 0.05. The results of the data diversity homogeneity test were declared homogeneous because they reached a significance value of 0.05. The experimental class and control class data were tested using the t test and were declared passed because the data was normally distributed and homogeneous. Following is Table 3 t test results

Table 3. Paired T test

		Paired Differences		
		Means	std. Deviation	Sig.
Pair 1	Pretest Control - Posttest Control	-31.48	16.33865	,000

Pair 2	Pretest Experiment - Posttest Experiment	-48.89	11.54701	,000

Based on the table above, it was found that the t-test values for the control and experimental classes obtained a significance value of 0.000 where the value was less than α (0.05). Therefore, the decision to reject H0 was obtained with the conclusion that there was a significant average difference between the pre-test and post-test data in the control class. This means that the average post-test obtained is higher and significantly different from the pre-test.

Proof of the results of the effectiveness test showed that in the first and second meetings, it was seen that the average student learning outcomes in the experimental group were higher than the control group. Judging from the results of the research that has been done, there are factors that cause an increase in student learning outcomes in the experimental group, namely the first factor, mind mapping-based pocket book learning media has been declared valid by experts so that it is suitable for use in thematic learning to improve student learning outcomes. The second factor, at the trial stage of mind mapping-based pocket book learning media, data obtained, namely student responses to learning media trials in general ≥ 80% gave a positive response, which means that the learning media is interesting for students to use.

The third factor, in terms of the results of students' responses to the experimental test, in general, students gave a positive response to the implementation of learning media, especially in the aspect of mind mapping-based pocket books, the way the teacher teaches, the learning atmosphere in class, the language in the pocket book, the suitability of the test in the material and the use of mind mapping in terms of images and coloring. The fourth factor, in terms of increased learning outcomes seen from the comparison of tests carried out by looking at the results of the pre-test and post-test getting a high increase as evidenced by the paired test and the results of the effective test of mid-mapping-based pocket books is strongly indicated by the final score, namely the paired test the post test score is higher than the pretest score(Arisetiyana et al., 2020). In contrast to the results of research in the control class using handouts. The difference lies in several factors. The first factor, there were some students who gave negative responses so that the use of handouts was not implemented properly. The second factor, the learning outcomes obtained are not as high as when using mind mapping-based pocket books.

Referring to the results of empirical studies, there are a number of factors that contribute to mind mapping-based pocket book learning media. The first factor is the fact that the pocket book learning media has been approved for validity by professionals, making it suitable for use in thematic learning to develop learning outcomes. This is in line with Hilmiyah's opinion which states that valid learning media can facilitate learning appropriately so that learning objectives are achieved (Hilmiyah et al., 2020). The second factor, referring to students' responses to the effectiveness test in general, students gave a positive response to the implementation of learning media, especially in pocket books based on mind mapping, the learning atmosphere in class, the way the teacher teaches,

the language in the media, the suitability of the test with the material being taught, and the convenience in understanding the thematic material which obtained a percentage of 98%. The students' responses indicated that the mind mapping-based pocket book learning media that had been developed was able to arouse students' interest and assist them in understanding the content of thematic material about alternative energy as a whole. Students who are motivated to learn will provide better learning outcomes (Sustainable & Komariah, 2020). The third factor is the teacher's good response to mind mapping-based pocket book learning media, claiming that pocket books make students involved and enthusiastic in thematic learning. The pocket book learning media based on mind mapping that has been developed has an attractive design, equipped with pictures and mind mapping so that it adds to students' curiosity. Learning steps encourage students to actively participate in learning activities so that students can be motivated to learn.

Mind mapping-based pocket book learning media is manifested as effective if it can assist students in developing the required competencies (Arisetiyana et al., 2020). This explanation leads to the conclusion that mind mapping-based pocket book learning media is valid and useful because it has succeeded in helping students achieve learning outcomes. The findings of the data analysis show that the use of this media can help students develop learning outcomes. The increased pretest and posttest results of experimental class students are evidence that learning media has succeeded in increasing learning outcomes. The findings of this study resulted in the conclusion that mind mapping-based pocket book learning media can improve student learning outcomes.

CONCLUSION

Significantly mind mapping-based pocket book learning media on theme 2 sub-theme 3 alternative energy can improve student learning outcomes in class IV SD. These findings indicate that mind mapping-based pocket books have succeeded in assisting students in fulfilling their learning objectives, the media has validity and effectiveness. Teachers and students can utilize mind mapping-based learning media as a guide when carrying out learning activities. The weakness of this media is that it only focuses on theme 2, subtheme 3, alternative energy and in the future, this media can be developed for other themes and can be used as interactive multimedia.

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