



Textbook Developing: Increasing Learning Outcomes through Mind Map-Oriented Textbooks

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Key words: Developing, textbook, mind map, learning outcomes, validation sheet

Abstract: This study is aimed to describe the quality of mind map-oriented textbook to improve. The instruments used in the research are the textbook validation sheet, the learning device's validation sheet, the questionnaire and the observation sheet. Data of the research results obtained as follows: developed textbooks have good quality eligibility to be used with the final result validation score of 79.85. The practicality of textbook is good based on the results of data analysis of the implementation of RPP that obtained a score of 79.95 (good), teacher activity with a score of 81.60 (excellent), student activity improved with good category, student responses agreed to 81.08%, Got good response from teacher with score 97.72% and result of study which show mastery 78,12%. The effectiveness of textbooks was tested with inferential statistics using SPSS 16.0 through F-test and t-test. It is known that student learning outcomes by using textbooks developed better than the results of student learning using student books. Based on the results of data analysis, it can be concluded that the developed textbook meets the eligibility criteria for use in learning, the practicality of the book is developed very well and the effectiveness of the book is tested with the difference of better results in the classroom using mind map-oriented textbooks.

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INTRODUCTION

Improving the quality of education is a prelude to human beings with intelligence and moral quality. Improvement requires a lot of support from various parties including family, community and government.

Education is a conscious and well-planned element to create an atmosphere of learning and learning process in order to effectively develop its potential to have spiritual, religious, self-controlling, personality, intelligence, noble character and the necessary skills of her, society, nation and state (Law Number 20 Year 2003 on National Education System).

The problem that often happens in the world of education is the process of learning in the classroom. Students have difficulties in understanding the flow of subject matter and re-explaining fully what they have learned.

Alternative solutions can be done with the development of innovative textbooks to improve student learning activities, learning quality and learning outcomes students. Development of textbooks is expected to provide new learning alternatives for students. A good textbook is expected to foster student's interest and curiosity by engaging students actively during the learning process.

Development of textbooks that fits the purpose is the development of textbooks that are mind map method oriented. Mind map is one of the most widely used innovative methods in the world. Mind map is based on the philosophy of cognitive learning theory (Gestalt) that children will easily understand everything if they see something as a whole, not the parts that are mutually separate from each other. Mind map works in accordance with the workings of the brain is radiant thinking. Mind maps use the principles of brain management, so that, both spirits work actively and synergistically. Mind map makes learning easier, fun and encourages children to learn independently and successfully in academic achievement.

In Mind map method, students are invited to make learning plans, review, predict and reevaluate their learning outcomes. Mind is very effective for developing ideas through a series of maps. Mind map can be used to help write essays or tasks related to concept assignments. Mind map is an ideal method to improve the mindset of students. Mind maps can be used to shape, visualize, design, record, solve problems, make decisions, revise and classify key topics, so that, students can do even a lot of tasks. In essence, the Mind map is used to brainstorm a topic as well as a powerful method for student learning^[1]. Mind map used through mind mapping to the subject matter in a very large area^[2].

The formulation of the problem in this research is focused on the development of handouts in terms of: how is the feasibility of mind map-oriented textbook to improve the learning outcomes of fourth grade students?; how is the practicality of mind map-oriented textbook to improve the learning outcomes of fourth grade students of primary school?; how is the effectiveness of mind map-oriented textbook to improve the learning outcomes of grade 4 elementary school students?. The specific objective of the research is to develop the mind map-oriented textbook as an effort to improve student learning outcomes. In general, the benefits of this research contribute as an alternative to create easy and fun learning.

Conceptual framework:

Textbook: Textbook is one component of the implementation of learning that serves as a means to achieve the objectives of learning and competence set. The textbook is a textbook used as a standard reference on a particular subject^[3].

As one component of learning, textbooks have special characteristics that distinguish it from other learning components. Octavia^[4] mentions the special characteristics of textbooks as follows:

Sorted by curriculum: The curriculum is a set of plans and arrangements concerning objectives, content and instructional materials as well as ways used as guidelines for the organization of learning activities. The curriculum messages are directed to the learning approach and competency control.

Focusing on learning goals: The content of textbook content, oriented to predetermined learning objectives. Therefore, the presentation of materials or tasks in the textbook leads to the goal to be achieved. Thus, the textbook can serve as a means to achieve the expected goals.

Oriented to student learning activities: Textbooks are books that students use on learning activities. Therefore, the presentation of content (materials and tasks) is directed to a series of activities that students must do to achieve the goal of mastery of knowledge, attitudes and skills.

The pattern of textbook content is adjusted with student intellectual development. The presentation of content (materials and tasks) in the textbook is adjusted to the level of intellectual development of students. Therefore, the content of the textbook is based on the student's mindset, student's knowledge and experience, the student's needs, the possibility of student's responsiveness and the student's language skills.

Develop student's creativity in learning: Presentation of textbook content can lead students to develop their own creativity. Thus, the presentation of the textbook content should encourage students to think, try, assess, behave and familiarize students to create.

Mind map method: Mind map is a method that can help students remember the key points, understand the main concepts and see the connection^[5]. Mind map is a method to store information and make it easier to remember the information, other than that mind map is also a technique of summarizing the material and projecting problems in the form of maps or graphics, so, it is easier to understand^[6].

Mind map is a form of varied notes because it combines brain function simultaneously and interrelated with each other^[5]. The brain can receive information in the form of images, symbols, images, music and others related to the function of the right brain.

Mind map is a system of thinking that works in accordance with the workings of the human natural brain and opens and exploits all its potential and capacity^[5]. Mind map has almost the same way of working with connections in the brain that initially with one main idea and then using the connections to solve it in the brain.

Here, is a set of advantages of mind mapping learning model: This method maximizes the work system of the brain. In making this mind map students not only use the left brain but also use the right hemisphere that can play with symbols, colors and images. It encourages creativity, simple and easy to do. Mind map gives students the freedom to pour their ideas in the form of visualization. It is interesting and easy to catch the eye. The use of symbols, pictures and colors will certainly be fun for students. Fun activities will create a positive atmosphere in learning. Thus, students will be happy to study the material created by using mind map method. Mind map can view the large amount of data easily^[7].

Mind map syntax: The preparation steps that should be done are: recording the lecture and listening to the key points or keywords of the lecture; showing the networks and relationships among these various points/ideas/keywords relating to the subject matter; brainstorming all the background knowledge about the topic; planning the early stages of mapping ideas by visualizing all aspects of the topic discussed; compiling ideas and information by making them accessible on one sheet only; stimulating creative thinking and solutions to issues related to the topic of discussion and reviewing lessons to prepare a test or exam^[1].

Important steps that must be done to start mind map method are as follows. Put the main idea/theme/point in the middle of the paper page. It will be easier if the paper position is not portrait but in a landscape position.

Use different lines, arrows, branches and colors to show the relationship between the main theme and other supporting ideas. These relationships are very important, because they can form the whole of thought and discussion about the main idea.

Avoid to be talkative. Show more good works than the content in it. Mind map should be created quickly without any time-consuming pauses and editing. For this reason, it is important to consider every possibility that should and should not be included in the map.

Choose different colors to symbolize something different. For example, blue for something that must appear on the map, black for other good ideas, and red for something that still needs further research. There is no definite coloring technique but make sure the colors are determined consistently from the beginning.

Leave some blank space in the paper. This is intended to facilitate further addition when new ideas are to be added.

A successful study: Buzan^[6] said that the formula of success in learning using mind map method include Trial, Event, Feedback, Check, Adjust and Success or abbreviated TEFCAS.

Trial: Mind map is defined as a method of recording. As a new thing, the skill of making the mind map needs to be trained. Therefore, students are required to try to continue in making mind maps and apply them in everyday life.

Event: Stage by stage or learning process must be passed by each student, so that, learning objectives can be done well. In this case, students must follow the learning steps that have been prepared in making mind map. For example from the introduction of mind map, looking for information, reading, determining keywords, revising, to how to test the understanding of the material using mind map made.

Feedback: Feedback in learning activities is needed for the class to be more interactive. In good learning, communication occurs between students or teachers with students. In addition, in the application of mind map method the role of teachers is to provide feedback both in the form of suggestions and reinforcement of the work of students, so that, the mind map will be made more perfect students.

Check: Mind map is not a product that must be once but it is important to do re-inspection and refinement. A good Mind map is not always just created procedurally but also has to reflect the whole material.

Adjust: A good learning process that compares the performance or work with competence standards and basic competencies that want to achieve. Mind map serves as a tool to remember in mastering the learning materials should be tailored to the learning objectives to be implemented.

Success: Application of mind mapping in learning is expected to help students master learning materials that are marked by the achievement of a satisfactory academic value. In addition, the application of the Mind map method is expected to form a successful person as trained in planning, selecting alternatives, organizing and evaluating activities.

MATERIALS AND METHODS

Design of the research: This research is a development research that is used to develop or validate the products used in education and teaching. This research focuses on the process of developing the book with the theme of my dreams. This research is a type of development research with the support of quantitative approach. Quantitative research is used to determine the effect of mind map-oriented textbooks towards the learning outcomes. Quantitative research design used is true experimental designs by using pretest-posttest control group design.

Before the treatment is given, the researcher observes the group of students who will get treatment to measure the initial condition (O_1). Next, the researchers determines the experimental group and the control group.

The experimental group will implement Problem-Based Learning (PBL) by using mind map-oriented textbooks (x) and control group is implemented with learning using student's book. After treatment, the two groups were re-observed to measure the presence or absence of change (O_2). Based on the above illustration it can be seen that the effect is indicated by the difference between O_1 and O_2 in the experimental group with O_3 and O_4 in the control group.

The result of the development of textbooks that will be used refers to the development theory proposed by Thiagarajan *et al.*^[8] which is a four D model that includes definitions, design, development and dispersio. The subjects in this study are grade 4 elementary school students.

Data analysis technique: Data analysis technique used in this research is quantitative descriptive analysis. The analysis of this data includes:

Feasibility analysis of textbooks: Feasibility analysis of textbook by determining the validity value of textbook with validation sheet. Textbook validation includes validation for content, presentation, language and chart.

Practicality analysis of the textbook is determined from the following points:

- Analysis of the implementation of the learning implementation plan
- Analysis of observation results on teacher and student activities
- Analysis of teacher and student responses when using textbooks developed during the learning process
- To know the practicality of textbooks with mind-oriented mapping can refer to student learning outcomes
- Analysis of textbook effectiveness is by hypothesis testing

RESULTS

Description and analysis of the feasibility product validation sheet: The feasibility of the product can be observed from the validation result by the validator. This validation includes material validation (content), presentation validation, language validation and chart validation.

The formula to obtain the percentage of each component is the score obtained by each component divided by the maximum score of each component

multiplied by 100%. From the calculation results found that: the material feasibility component gets the percentage of 72.22% and categorized can be used with many revisions; the feasibility component of the presentation gets 75% and categorized can be used with little revision, the language feasibility component gets percentage 88.88% and categorized can be used with little revision, components of chart get percentage 83.33% and categorized can be used with little revision. Thus, the final percentage of the validator's assessment of draft 1 textbook is 79.85%, it can be said to be worthy of use with a slight revision.

Description and analysis of product practicality validation sheet: The textbook practicality test starts from the implementation of the implementation of the learning implementation plan by two observers. The implementation of the problem-based learning model in the field trial is observed using the 2nd instrument. The observation is done with 3 lessons which is the implementation of the RPP using the problem-based learning model.

Then, it is followed by observation on teacher activity. The result of observation analysis of teacher activity is done by two observers in every meeting. Based on the results of the observation analysis of teacher activity showed an average of 81.03% for observers 1 and 82.18% for observer 2, it shows that using textbooks greatly help teachers to implement optimal learning. Student's responses to the lessons learned by using textbooks get a positive response. This is indicated by the data of "agree" 81.08% that can be categorized as good. The items on the test sheet were tested using a differentiating power test. It is known that students who achieve minimal mastery is as much as 25 people and classical completeness reaches 78.12% which indicates that the textbook developed can improve students who achieve the criteria of minimal mastery.

Description and analysis of product feasibility validation sheet: Based on normality test result, it can be seen that control group and experiment group is stated control class and experiment have normal distribution because having significant number 0,311 for control class and 0,565 for experiment class means >0.05 .

Based on homogeneity test results, it can be seen that the control group and the experimental group is expressed control and experimental class has a normal distribution because it has a significant number of 0.816 is worth >0.05 . To find out the result of Pretest, hence, there is the equality test of variance, in test of equality of variant of number F is used to assume the two variants are equivalent (equivalence variances assumed). In Table 1, it is known that the value of F arithmetic yielded 0.054 with a probability (sig.) of 0.816±5% means there is no

Table 1: Variant difference

Scoring aspects	Validator's score		
	Scores	Percentage	Category
Material feasibility	26	72.22	3 (good)
Presentation feasibility	45	75.00	3 (good)
Language feasibility	36	88.88	4 (very good)
Chart feasibility	40	83.33	4 (very good)
Total		79.85	3 (good)

variant difference between the experiment and the control. The two same classes are 0.913 with probability (sig.) of 0.365. Due to the probability number, it can be interpreted that there is no significant difference between the initial capability of the experimental class and the control class. After learning, learners are given a matter of posttest. Posttest is given to determine the extent to which learner's understanding of the learning that is implemented. Problem posttest is given to determine whether the posttest results of the control class is different or not with the posttest of the experimental class.

Based on the output of the independent sample t-test the value $-t_{count} < -t_{table}$ ($-3.941 < -1.998$) and $p-(0.000 < 0.05)$, then according to the basis of decision making in the independent sample t-test Test, H_0 is rejected and H_a accepted. So, it can be concluded that the textbook oriented mind map method has an effect on the improvement of learning outcomes of grade 4 elementary school students.

DISCUSSION

Mind map validation: The form of textbook developed in this research is textbook theme 7 grade 4 which is oriented to mind map method. Teaching lessons developed in the second semester based on basic competence mapping in the curriculum 2013. Teaching lessons developed refers to the syntax of problem-based learning tailored to learning indicators.

The result of validation by the material expert obtained a score of 72.22% which can be interpreted either with the category can be used with a little revision with the content validation details covering the component depth component in accordance with the student's thinking level and feature features, for example, the references are stated very well. The result of validation of presentation component is stated good with score 75% with details of each got score 3, for aspect of pay attention aspect of safety in play otherwise very good. Result of validation of language component with score 88,88% which mean very good. While the results of the chart validation expressed with a score of 83% is categorized very good. The results of the overall validation of the content component (material) of presentation, language and chart expressed well with a score of 79.85%.

Process of study through mind map: The syntax is implemented in the learning according to the character of the learning model based on the problem which is organizing the teaching on a number of important questions or issues, both socially and personally is meaningful to the students^[9]. In order to this model of learning based on this problem can be implemented well, then, the teacher should be able to manage the time as well as possible. In general, the syntax of learning can be done, so that, the implementation plan of learning developed to facilitate the students to successfully complete the learning activities.

Classroom management by the teacher affects the activities of the students. Teachers who can bring the classroom atmosphere to life make the class fun. The learning atmosphere should be able to create a passion for learning, cheer up the hearts of students, make the student's hearts comfortable in the classroom or in other learning places, so that, students focus their attention In full to study. This appears in the observed classroom observations.

Based on student questionnaires data on activities and learning components at the 3rd meeting obtained average student response 81.08% agreed and 18.02 states disagree. From the average score is seen that the students give a positive response to the activities and learning components by using textbooks developed.

Positive student responses to activities and learning components indicate that students have motivation in learning. Motivation learning is a drive that motivates and encourages student behavior to learn, so as to influence the achievement of learning outcomes. Based on the results of the questionnaire Students, it can be said that the learning activities undertaken and also textbooks used can provide stimulus for students to increase success in learning.

The effectiveness of using mind map: The effectiveness of teaching textbook development with mind map method is done through hypothesis test. Hypothesis test using independent sample t-test test, firstly, pretest result of control class and pretest of experiment class. The test results of independent sample t-test on pretest describe that sig. 0.365 where >0.05 , then there is no difference between the control pretest and the experimental class. Furthermore, posttest data control class and posttest experimental class are tested by independent sample t-test. Based on the output of the independent sample t-test the value $-t_{count} < -t_{table}$ ($-3.941 < -1.998$) and p-value ($0.000 < 0.05$), then according to the basis of decision making in the independent sample t-test and H_a accepted. Hence, it can be concluded that the teaching book oriented mind map method influences the results of the fourth grade students.

Furthermore, the experimental class is a class where a large group of textbook development experiments conducted. In the classroom that uses the development of a textbook there is an assessment of learning outcomes. The test results of all the learners are collected and analyzed to find out how many learners are successful in this learning. Classically, learners are said to be thoroughly learn if the success of learners who scored ≥ 67 reached 75%. This classical assessment consists of posttest values. Based on the classification, learners who get the final score >67 is 25 students. After the classical calculation is obtained classical percentage of 78.12%. Therefore, the results of classical data can be interpreted high.

CONCLUSION

Based on the analysis of data obtained can be concluded that the textbook oriented mind map method that has been developed is good because the validation of four components of feasibility indicate good category Practical textbook oriented mind map method has a good category based on observations on the implementation of the implementation plan of learning, Teachers and student activities during learning. Based on the results of student and teacher questionnaire analysis showed positive response to developed textbook. The effectiveness of the mind map-oriented textbook with the indicated difference in the fourth grade student learning outcomes before and after using the mind map method.

Teachers should use textbooks that are oriented to the mind map method in order to help students learn a subject matter because it is feasible to use.

Learning activities using the development of textbooks oriented map is very suitable for elementary school students, so, it is advisable to develop this textbook for themes and other subjects.

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