

The Effectiveness of SAVI Approach-based Teaching Materials Oriented to Mathematical Connection Ability

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Abstract. *This study aims to analyze the effectiveness of SAVI approach-based teaching materials developed for mathematical connection ability. This study was research and development. The subjects were 36 Grade 8 students and a mathematics teacher and the objects were the SAVI approach-based teaching materials oriented to the mathematical connection ability. The effectiveness of the teaching materials measured by four aspects: (1) the observation of the teacher's ability to manage the learning should at least be in the "good" category, (2) six of the eight aspects of students activities are within the ideal time interval, (3) the students' mastery learning are fulfilled both individually and classically, and (4) the student and teacher questionnaire responses show positive responses. The results revealed that the effectiveness criteria were fulfilled. The observation of the teacher's ability to manage the learning was in the very good category (4.22). The student activities in learning was within the threshold for achieving the ideal time. Also, The students' mathematical connection ability satisfied the mastery learning individually and classically (84.11%). The teacher and student questionnaire responses showed positive responses. Thus, the SAVI approach-based teaching materials oriented to mathematical connection ability are feasible as a learning resource for students in learning mathematics.*

Keywords: *teaching materials, mathematical connection, effectiveness, SAVI approach*

Introduction

Teaching materials are important for the implementation of learning in schools. It allows teachers to implement their learning activities easier and helps students learn (Depdiknas, 2008). Teaching materials can be varied depending on the needs to achieve the learning objectives. The teacher can also customize the teaching materials based on the students' characteristics and problems they face. Yet, today, the development of teaching materials has not been satisfactory because the preparation of the teaching materials is solely based on the estimates or assumptions of what students will learn through a certain study path. These teaching materials will not yield optimal learning outcomes (Mulyana, 2012).

Teaching materials have a systematic structure and sequence, explain the instructional objectives, motivate students to study, anticipate the students' difficulties, provide students with many exercises, provide summaries, and are generally oriented to individual students (Aryaningsih, Sudiana, & Martha, 2013; Darmadi, 2009; Majid, 2011; Retno, Insani, & Rosita, 2013). Teaching materials can help students in their learning process, so they do not necessarily

rely on the teacher as the only source of information. Also, students can learn independently in achieving learning competencies (Aryaningsih et al., 2013; Retno et al., 2013; Sholichah, Andajani, & Suherjanto, 2013).

To support the success of learning, several aspects should be considered and prepared to engage the students. One of which is designing the materials based on the principles and characteristics of a learning approach. In this study, the teaching materials were developed based on Somatic, Auditory, Visual and Intellectual (SAVI) approach. Siagian and Sembiring (2018) argued that the SAVI approach enables the learning activities to be more optimal because it involves students' entire senses. Learning using somatic can enrich students' learning experiences. The learning process is more meaningful and learning by involving the auditory senses can help students record and understand the information. The involvement of visual senses is no less important because it can visualize real-life ideas, and most human beings are equipped with the thinking ability to be empowered by education so that students can practice critical thinking, reason, identify, find, create, construct, solve problems and apply them in daily life (Rizky, Ariyanto, & Sutrisno, 2017; Umam & Azhar, 2019).

SAVI is a learning approach emphasizing learning to utilize all senses of students (Meier, 2000). The term SAVI itself stands for Somatic, that are body movements (hand-on, physical activity), learning by experiencing and conducting; Auditory that learning must be done by listening speaking, presenting, arguing, suggesting, and responding; Visually, that meaningful learning should use the senses through observing, drawing, demonstration, reading, using media and props; And intellectuals, that learning should use minds-on and concentration, and they should be practiced through reasoning, investigating, identifying, discovering, creating, constructing, solving problems, and implementing (Meier, 2000; Ngalimun, 2013).

So far, the teaching materials used by students mostly focus on the content and concepts of the mathematics materials itself. The 2013 curriculum document (Kemdikbud, 2013) implied that the nature of learning is textbook-oriented, while ideally, it should be contextual. Textbooks only contain discussion materials, whereas ideally, they should contain material and learning processes, assessment systems, and expected competencies. Therefore, it is necessary to have teaching materials (other than textbooks) as complementary materials that can excel students in learning. In this regard, the availability of teaching materials is needed to support the learning process and improve students' mathematics learning achievement, one of which is by applying the SAVI approach.

The development of the SAVI approach-based teaching materials is a promising solution because it is structured between learning materials and student activities through discovery and exploration. The learning process tends to be student-centered, as Cai, Perry, Wong, and Wang,

(2009) stated that teachers must prepare well-structured learning, so it is student-centered. The development of the SAVI approach-based teaching materials is expected to achieve the objectives in mathematics learning. Depdiknas (Wardhani, 2008) explained that the objectives of mathematics learning are: (1) understanding mathematical concepts, explaining the correlation between concepts and applying concepts or algorithms flexibly, accurately, efficiently, and precisely in problem-solving; (2) using reasoning on patterns and properties; (3) solving the given problems; and (4) communicating ideas with symbols, tables, diagrams, or other media; and (5) appreciating the usefulness of mathematics in life. On the other hand, NCTM (2000) sets the standards for mathematical ability required by learners, such as problem-solving, reasoning and proving, communication, connection, and representation.

One of the mathematical abilities students lacking is mathematical connection ability. Generally, learners have low mathematical connections (Badjeber & Fatimah, 2015; Sulistyaningsih, Waluya, & Kartono, 2012). Saminanto and Kartono (2015) also found that the average mathematical connection ability of high school students is poor (only 34%) because students are not accustomed to facing problems oriented toward mathematical connection ability. The availability of teaching materials also contributes to this issue, where the available resources only focus on the concepts, without oriented to mathematical connection ability. Mathematical connection ability enables students to see the interconnectedness and usefulness of mathematics (NCTM, 2000). Coxford (1995) defined mathematical connection the ability as the ability to connect the conceptual and procedural knowledge, use mathematics on different topics, apply mathematics in real-life activities, and acknowledge the connections between topics in mathematics.

Several studies have been conducted using the SAVI approach in mathematics learning. The SAVI approach is effective in cultivating and improving students' mathematical modeling skills (Khusna & Heryaningsih, 2018). It affects mathematics learning and can improve students' mathematics learning achievement. The SAVI approach enables the emergence of an objective attitude, curiosity to solve problems well, and critical thinking (Sahara, Mardiyana, & Saputro, 2018). It also promotes communication skills because students are actively involved and interact with each other in the learning (Abda & Fonna, 2020). However, limited research has been found discussing the effectiveness of teaching materials based on the SAVI approach oriented toward students' mathematical connection ability. Hence, this study employed the SAVI approach-based teaching materials oriented to mathematical connection ability.

To ensure that the teaching materials developed meet the quality standards, and achieve goals in fostering students' mathematical connection skills, the developed teaching materials must satisfy the criteria of validity, practicality, and effectiveness. This article specifically discusses

the effectiveness of the SAVI approach-based teaching materials oriented to mathematical connection ability. Teaching material is said to be qualified if it meets the effectiveness aspect (Nieveen, 1999).

Method

This development research used a 4D development model: Define, Design, Develop and Disseminate (Thiagarajan, Semmel, & Semmel, 1974). The subjects in this study were a mathematics teacher and 36 Grade 8 students from one of public junior high schools in Medan, Indonesia, while the object in this study was the SAVI approach-based teaching materials oriented to the mathematical connection ability. This article discusses the effectiveness of the developed teaching materials or the 'Develop' stage of the 4D development model. Effectiveness refers to the extent to which the intervention's experiences and outcomes are consistent with the intended aims (Nieveen, 1999).

The instruments used to measure the effectiveness of the SAVI approach-based teaching materials were observation sheet, questionnaire, and mathematical connection ability test. The data were then analyzed descriptively by reviewing the effectiveness aspects of teaching materials, including 1) the results of the observation of teacher's ability in conducting lessons; 2) the results of students' activities within the interval of ideal time; 3) the results of students' mathematical connection ability test meet the minimum criteria of mastery learning; and 4) the results of students and teacher questionnaires showing a positive or very positive response to the teaching materials. The following section explains each effectiveness aspect.

1) The results of the observation of teacher's ability in conducting lessons

The observation focuses on seven aspects of: preparation; delivering learning material; practice (the process of solving mathematics problems); presenting work results; closing activities; time-management in the learning; and classroom climate (Sinaga, 2007). The observation results of teacher's ability to conduct lessons were analyzed by the following stages.

a. Generating categories from the criteria of each aspect

$$NK = \frac{\sum NRK_i}{n}$$

Where:

NRK_i is a criterion for every aspect

n is the number of the i^{th} aspect criteria

b. Generating the Teacher Ability Score from the average of each category

$$NKG = \frac{\sum NK}{m}$$

Where:

NKG is the score of the teacher's ability to conducting lessons

m is the number of categories

The NKG category is the interval for determining the level of the teacher's ability to manage learning with the SAVI approach-based teaching materials (Sinaga, 2007), as described in Table 1.

Table 1. Criteria for determining teacher ability level to manage learning

Interval	Category
$1 \leq NKG < 2$	Poor
$2 \leq NKG < 3$	Fair
$3 \leq NKG < 4$	Good
$4 \leq NKG \leq 5$	Excellent

(Source: Sinaga, 2007)

To meet the effectiveness aspects, the score of teachers' ability to conduct lessons should at least be in the "good" category.

2) The results of students' activities within the interval of ideal time

Data analysis to determine whether the students' activities are within the interval of ideal time in learning (PWI) was based on the presentation of time used in each aspect of learning activities, the formula used is as follows, and the criteria are presented in Table 2.

$$PWI = \frac{\text{the time used in the } i\text{th aspect}}{\text{time available in learning}} \times 100\%$$

Table 2. The criteria of ideal time for student activities in learning (Sinaga, 2007)

No.	Aspects of Student Activities	Percentage	Tolerance Limits	Interval
1	Pay attention to the teacher/friend's explanation	10%	5%	$(5\% \leq PWI \leq 15\%)$
2	Read and understand problems on student activity sheets	15%	5%	$(10\% \leq PWI \leq 20\%)$
3	Read student books and ask questions between students in solving problems/finding ways and answers	20%	5%	$(15\% \leq PWI \leq 25\%)$
4	Asking students and teachers to solve problems/find ways and answers	10%	5%	$(5\% \leq PWI \leq 10\%)$
5	Solve problems on student activity sheets	15%	5%	$(10\% \leq PWI \leq 20\%)$
6	Presenting the results of group work/conveying ideas or opinions	10%	5%	$(5\% \leq PWI \leq 15\%)$
7	Take notes on things that are relevant to teaching and learning activities	5%	5%	$(5\% \leq PWI \leq 10\%)$
8	Make a conclusion	5%	5%	$(5\% \leq PWI \leq 10\%)$

(Source: Sinaga, 2007)

3) The results of students' mathematical connection ability test

The students' learning outcomes were reviewed based on the results of the mathematical connection ability test. The mastery learning criteria refer to the minimum mastery learning

criteria or KKM (66) and 80% of students have satisfied the classical mastery learning. The results of the students' mathematical connection ability test are classified in Table 3.

Table 3. Classification of students' mathematical connection ability

Interval	Category
$0 \leq MCAS < 54$	Very low
$54 \leq MCAS < 65$	Low
$65 \leq MCAS < 79$	Medium
$79 \leq MCAS < 89$	High
$89 \leq MCAS < 100$	Very high

(modified from Widoyoko, 2014)

Information: MCAS = Mathematical Connection Ability Score

4) The results of students and teacher questionnaires

Questionnaires are used to measure teacher and student opinions about their interest in using the teaching materials, satisfaction, novelty, and their understanding of teaching materials being developed. The questionnaire results were analyzed by grouping the responses and determining the percentage for each response, as presented by the following equation. The responses are said to be positive if the percentage of "yes" response to each aspect is greater than 70%. The response criteria is illustrated in Table 4.

$$\text{Responses} = \frac{\sum \text{teacher/student who responds positively}}{\sum \text{teacher/student who responds}}$$

Table 4. Response categories (Rs)

Percentage (%)	Category
$R_s \geq 85$	Very positive
$70 \leq R_s < 85$	Positive
$50 \leq R_s < 70$	Less Positive
$R_s < 50$	Negative

(modified from Prasetyo, 2012)

Results and Discussion

The teaching materials developed manifest a good quality if they meet the effectiveness criteria. Hence, the SAVI approach-based teaching materials would be appropriate to be used if they positively impact the users. To examine the effectiveness of teaching materials, they were implemented in the learning of circles for five lessons. The results of the development of teaching materials are presented in the following sections.

The Results of The Observation of Teacher's Ability in Conducting Lessons

Data on the teachers' ability to conduct the learning is obtained from observations conducted by two observers. The observation results are presented in Figure 1.

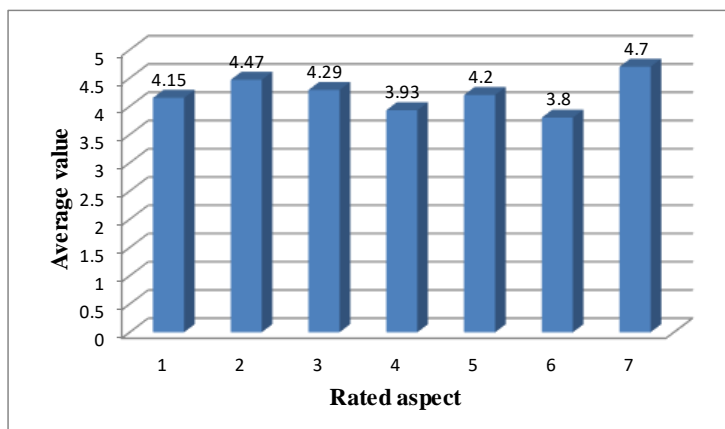


Figure 1. The score of teachers' ability in conducting lessons

Figure 1 shows that the ability of teachers is classified as "excellent" in the aspects of preparation (1), delivering the learning materials (2), practicing (the process of solving math problems) (3), closing activities (5), and classroom climate during the learning process (7). While, it is categorized as "good" in the aspect of presenting work results (4) and time-management in the learning (6). Overall the learning using SAVI approach-based teaching materials is categorized as "good". This is also evident from the enthusiasm of students and teachers in the learning process. Based on observations of the teachers's ability to conduct the learning, it can be concluded that the SAVI approach-based teaching materials are effective to be used in learning.

The Results of Students' Activities Within the Interval of Ideal Time

In determining the percentage of the ideal time of student activities, the researcher was assisted by two observers observing the students' activities based on the indicators that have been described previously. The results can be seen in Table 5.

Table 5 shows the average percentage of ideal time of student activities during the learning process using the SAVI approach-based teaching materials for the five lessons is 10.66%, 16.98%, 18.9%, 7.87%, 16.25%, 12.57 % 8.24% and 8.53%. The highest percentage of time spending by students is to read student books and ask questions between students in solving problems/discovering the solution to problems on student activity sheets and in student books (18.89%, within the effective limit based on the indicators). While the smallest proportion of time spending by students is students asking questions between students and teachers to solve problems/ discovering the solution to problems (7.87% of the established criteria threshold). In the learning process, using the SAVI approach-based teaching materials requires students to be more active in constructing concepts. Thus, the teacher's role in learning is as a facilitator.

The time spent by students in recording things relevant to teaching and learning activities is ideal (8.236%, within the threshold of the criteria set). It can be interpreted that students can do things that have been determined during the learning so that activities irrelevant to learning are not significant. Based on Table 5, it can be concluded that student activities have reached the

achievement percentage of ideal time. From the eight indicators, it can be seen that the percentage of student activities is still within the threshold of the achievement percentage of ideal time or the tolerance interval of a predetermined category.

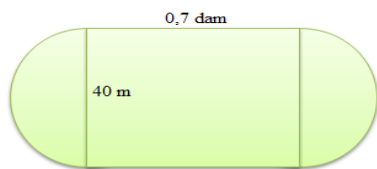
Table 5. Observation results of the ideal time of student activities in learning

Lesson	The Percentage of the Ideal Time for Student Activities							
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
1 st	8.46	17.65	20.22	8.09	16.54	12.5	8.46	8.09
2 nd	9.2	17.28	18.01	8.82	16.91	12.87	8.09	8.82
3 rd	11.76	15.81	18.38	7.35	15.81	13.6	8.82	8.46
4 th	11.76	16.9	18.38	6.99	16.91	11.4	8.46	9.2
5 th	12.13	17.28	19.49	8.09	15.07	12.5	7.35	8.09
Average	10.66	16.98	18.9	7.87	16.25	12.57	8.24	8.53

The Results of Students' Mathematical Connection Ability Test

The effectiveness of a teaching material that has been developed and used by students is indicated by the learning outcomes. In this study, students' learning outcome was the mathematical connection ability. The mathematical ability test was given at the end of each lesson to investigate how the students' mastery of the materials they have learned. The test results are also used as an evaluation material for researchers to make the required improvement. The following is the problem given to students.

Pak Lukman memiliki sebidang kebun berbentuk seperti gambar di bawah, agar tanaman kebun tidak di ganggu hewan Pak Lukman ingin memasang pagar pada kebunnya.



(a) Kemukakanlah caramu untuk menghitung keliling kebun Pak Lukman!; (b) Berapakah panjang pagar yang diperlukan Pak Lukman?; dan (c) Berapakah biaya pemasangan pagar yang harus dibayar oleh Pak Lukman jika harga pemasangan pagar Rp 27.500,00/m?

Mr. Lukman has a garden plot like the picture below, so that the garden plants are not disturbed by animals Mr. Lukman wants to put a fence in his garden: (a) Tell us your method of calculating the circumference of Mr. Lukman's garden!; (b) What length of fence does Mr Lukman need?; and (c) How much is the cost of installing the fence that Mr. Lukman must pay if the price for installing the fence is Rp 27,500.00/m?

Based on the problem above, it was found that two students had mastery in the very low category, eight people were in the low category, 19 people were in the medium category, and seven students were in the high category. Figure 2 illustrates the solution provided by the low category students.

Based on students' solution in Figure 2, it can be seen that the student had not been able to come up with the ideas requested in solving the problem. Conceptually the students had already understood, but she/he was careless in the calculations so that the results were incorrect. Students' errors in answering the questions in point (b) influenced the solution of point (c). Students are said to meet the individual mastery learning if their scores are ≥ 70 . While classically, the

percentage of mastery learning of student learning outcomes should be $\geq 80\%$. The overall results of the mathematical connection ability test are presented in Table 6.

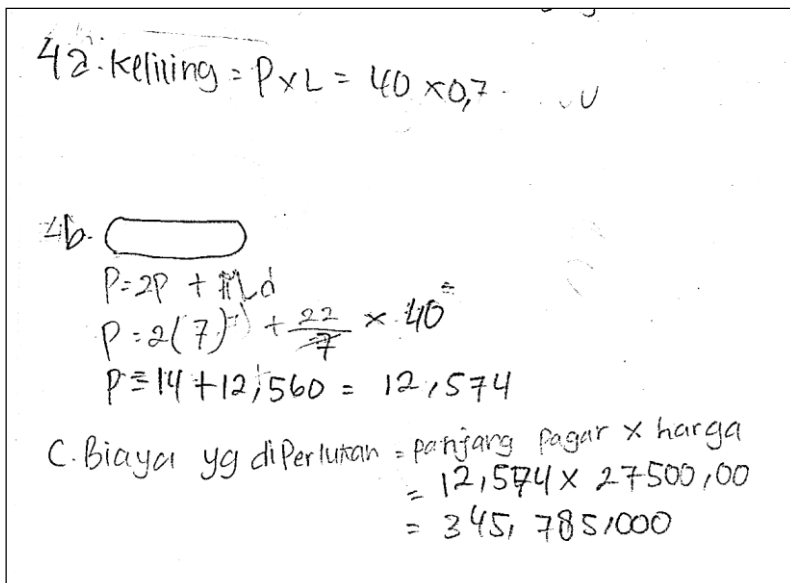


Figure 2. Solution provided by a low category student

Table 6 reveals the outcomes of students' mathematical connection ability test have met classical mastery learning. Table 7 provides the classification of the level of students' mastery of teaching materials.

Overall, from the results of students' mathematical connection ability tests meet the minimum percentage criteria for classical mastery learning, i.e., 80% of the total number of students. The average percentage of classical mastery learning achieved by students is 84.11%. So, it can be concluded that the results of students' mathematical connection ability tests have satisfied both classical and individual mastery learning criteria.

Table 6. Description of students' mathematical connection ability test results

Information	Lesson				
	1 st	2 nd	3 rd	4 th	5 th
Highest score	100	100	100	100	100
Lowest score	44.44	52.63	58.8	54.17	54.17
Average	75.3	74.9	81.2	78.9	73.3
The percentage of the classical mastery of mathematical connection ability	82.35%	82.35%	85.3%	82.35%	88.23%
The mean percentage of classical mastery of mathematical connection ability	84.11%				

Table 7. Classification of mastery students' mathematical connection ability

Interval	Lesson										Category
	1 st		2 nd		3 rd		4 th		5 th		
	f	%	f	%	f	%	f	%	f	%	
$0 \leq \text{MCAS} < 54$	2	5.88	2	5.88	1	2.94	0	0	0	0	Very low
$54 \leq \text{MCAS} < 65$	4	11.76	4	11.76	4	11.76	6	17.65	4	11.76	Low
$65 \leq \text{MCAS} < 79$	20	58.82	17	50	10	29.42	11	32.36	22	64.71	Medium
$79 \leq \text{MCAS} < 89$	3	8.82	7	20.6	11	32.36	8	23.52	6	17.65	High
$89 \leq \text{MCAS} < 100$	5	14.72	4	11.76	8	23.52	9	26.47	2	5.88	Very high

The Results of Students and Teacher Response Questionnaires

The teacher and student questionnaire were first validated so that it was appropriate to be used in measuring responses to the SAVI approach-based teaching materials. This questionnaire was administered to examine the extent of teacher and student interest in using the teaching materials, satisfaction, novelty, and their understanding of teaching materials being developed, such as the content of instructional materials, formats, pictures, and activities in teaching materials.

The results of Teacher Response Questionnaire

The teacher questionnaire was given to the teachers involved in implementing learning using the SAVI approach-based teaching materials to investigate the extent to which these teaching materials had a positive impact on the learning process. The results of the teacher questionnaire are presented in Table 8.

Based on the results of the teacher questionnaire, it can be concluded that the components of teaching materials developed using the SAVI approach can help teachers in the learning process. In addition, the components of teaching materials are also different from the common ones. These components enable the teacher to get a new understanding of mathematical connection the ability, one of the competencies that must be mastered by students in learning mathematics. Overall the teacher's responses to the components of teaching materials developed were very positive.

Based on Table 9, it is concluded that students' responses to the SAVI approach teaching materials were very positive. Thus, based on the results of student questionnaire responses to the components of teaching materials developed, it can be said that the responses for all aspects are positive so that this component of teaching materials is effective for use. Hence, based on the results of the practitioners or expert teams' assessment and the analysis results of the use of the SAVI approach-based teaching materials, it can be concluded that all aspects of the teaching materials developed have satisfied the effectiveness criteria.

One of the goals of research and development is to produce a product that is suitable for user needs. In this article, the discussion focuses on the effectiveness aspect of the of teaching materials developed. First, the observations of the teacher's ability to conduct learning is categorized as "good", indicating that it meets the criteria for the teacher's ability to conduct the learning using the SAVI approach-based teaching materials. Teachers can apply the teaching materials well based on the steps prepare following the SAVI approach. Thus, this has an impact on the achievement of students' mathematical connection ability. This finding is in line with Muanifah and Sa'diyah research (2018), who found that the SAVI approach is an alternative

learning approach that can be used to help teachers improve student learning outcomes in mathematics.

Table 8. Description of teacher response questionnaire results

Aspect	Category			
	Very helpful	Helpful	Less Helpful	Not Helpful
How useful is the learning component:				
a. Concept maps		√		
b. Lesson plan		√		
c. Teacher's manual	√			
d. Student book	√			
e. Test lattice	√			
f. Learning activities	√			

Teacher comment:

These components really help me in teaching, with the concept map I can emphasize to students the materials that must be mastered before studying this material. Besides, the teacher book and student book are designed interestingly and well so that my students and I can be more focused on learning, especially with student activity sheets and the discussion of the materials.

Aspect	Category			
	Very good	Good	Less good	Not good
What do you think about the learning component				
a. Concept maps	√			
b. Lesson plan	√			
c. Teacher's manual	√			
d. Student book	√			
e. Test lattice	√			
f. Learning activities	√			

Teacher comment:

These components are very good, especially very different from the usual ones, because the questions and problems that are related to the students' daily lives. And as the researchers explained, this book aims to improve connection ability, mathematically, and this is quite new for me because I didn't know it before.

Aspect

What is your opinion if teaching materials based on the SAVI approach are applied and used as the main strategy in learning mathematics?

Teacher comment:

If every learning has components like this, I think learning will be better, but it must vary, so it is not monotonous.

Aspect

In your opinion, what obstacles did you encounter during the learning process by using teaching materials based on the SAVI approach?

Teacher comment:

The obstacle lies with students because so far, students are not accustomed to learning like this, so they must be guided and directed so that the use of teaching materials in learning runs well.

Second, the percentage of student activities in the learning process using the SAVI approach-based teaching materials has met the criteria. Based on observations, the students spent the highest percentage of their time is to read students' books and ask questions between students in solving problems/finding solution to problems on student activity sheets and in student books. Haerudin (2013) explained that the SAVI approach provides greater opportunities for students to develop their mathematical abilities. All senses are involved in the learning process. The somatic

element was developed for students to have a creative attitude and the courage to express their opinion. The auditory is also directed so that students have the ability to speak and listen carefully to others. The visualization is directed so that students have good observations and they can provide directed responses that are in line with what is expected. Finally, the intellectual element is developed so that students can think well, be creative, and solve problems well. In the developed teaching materials, the material is presented by emphasizing student-centered activities in constructing concepts by utilizing simple objects and tools. For example, when students are directed to find the approximate value of π to determine the circumference and area of a circle. Students are asked to take measurements on circular objects that they have such as coins, drink bottle caps, rubber bands, watches, and so on using simple tools that students have such as a ruler. This is in line with the view that introducing mathematical concepts can be motivated through properly designed direct activities supported by manipulative material. Such activities must integrate rich mathematical ideas with familiar physical tools (Abramovich, Grinshpan, & Milligan, 2019).

Table 9. Description of student questionnaire results

Aspect	Percentage (%)	
	Interested	Not interested
How do you feel about the components of teaching material being developed, such as:		
a. Teaching material	88.2	11.8
b. Student book	97.05	2.95
c. Student activity sheet	88.2	11.8
d. The atmosphere of learning in class	88.2	11.8
e. Teacher mastery in teaching	97.05	2.95
Average	91.74	8.26
Aspect	Percentage (%)	
	There is novelty	There is no novelty
What do you think about the components of the teaching materials developed, such as:		
a. Teaching material	94.11	5.89
b. Student book	94.11	5.89
c. Student activity sheet	97.05	2.95
d. The atmosphere of learning in class	91.17	8.83
e. Teacher mastery in teaching	94.11	5.89
Average	94.11	5.89
Aspect	Percentage (%)	
	Interested	Not interested
Are you interested in taking part in further learning activities like what you are currently taking part in?		
91.17	8.83	
Aspect	Percentage (%)	
	Yes	No
What do you think of student books and student activity sheets:		
a. Can you understand the language used in student books and student activity sheets?	91.17	8.83
b. Are you interested in the appearance (contents, illustrations, pictures, and layout of the pictures) contained in student books and student activity sheets?	94.11	5.89
Average	92.64	7.36

Third, the results of student mathematical connection ability test also meet individual and classical mastery learning criteria. This shows that the SAVI approach-based teaching materials developed oriented to the mathematical connection ability positively influence the achievement of students' mathematical connection ability. With learning applying the SAVI approach principles, students can easily understand the abstract concepts, the learning process can provide an interesting and meaningful impression for students and learning outcomes will retain longer. By optimizing physical movements, hearing, vision and thinking processes in students in the learning process, the learning quality will be better and memorable. Students will obtain the desired learning experience, which in turn will enhance students' motivation to learn and improve the learning outcomes (Yohani, Rakhmat, & Mulyana, 2014). Several studies have also shown that the application of the SAVI learning model and its modification is effective in supporting the growth of students' mathematical abilities (Pujiastuti, Waluya, & Mulyono, 2018; Siagian & Sembiring, 2018). Besides that, in this teaching material, the mathematical problems given to students are presented in the form of story questions (essays), so that these trains and fosters students' mathematical connection skills. Teachers can see students' abilities through responses that are reflected in the steps that students take. Essay tests encourage students to understand the subject matter more deeply. Students who are accustomed to doing essay tests can better understand the problems faced so that they can find the right solution. When taking an essay test, students cannot rely on luck just by choosing random answers, identical to when taking a multiple-choice test (Wijaya, 2016). The ability of mathematical connections can be seen through how students connect previous knowledge with existing problems so that they can solve these problems with their understanding (Dudung & Oktaviani, 2020).

Fourth, the results of student and teacher questionnaires showed positive responses to teaching materials because the SAVI approach-based teaching materials encouraged students to be active in the learning process. The SAVI approach emphasizes learning based on activities, actively moving while learning by utilizing as many senses as possible, and enabling the whole body or mind involved in the learning process. As revealed by Meier (2000), "learning doesn't automatically improve by having people stand up and move around. But combining physical movement with intellectual activity and the use of all sense can have a profound effect on learning. This gives a positive impression in the learning process so that students and teachers are very interested in using the SAVI approach-based teaching materials. This is also supported by previous research developing teaching materials using the SAVI approach as characteristics of teaching materials. They indicated that teaching materials with the SAVI approach could foster student motivation in learning and improve student learning outcomes (Koderi, 2017; Novitayani,

Sukarmin., & Suparmi, 2016; Sari, Jufri, & Sridana, 2017; Widyarini, Syahri., & Muhaimin, 2018).

Conclusion

Based on the results of the study, it is concluded that the SAVI approach-based teaching material has met the effectiveness criteria; thus, it is appropriate for use in learning. Four indicators of the effectiveness of teaching materials have been satisfied, including the observation of the teacher's ability to conduct the learning (with an average of 4.22), the percentage of student activities in learning within the interval of ideal time, the students' individual and classical mastery learning (84.11%), and student and teacher questionnaire showing positive responses.

The findings of this study are expected to be used as a reference in helping schools and teachers to grow and increase students' interest in learning mathematics. Schools and teachers are expected to be able to create creative and innovative learning to increase students' interest and motivation by developing teaching materials using other learning approaches. Teaching materials designed by the characteristics of students will be more effective in helping students to understand the content of the material; this is because students feel the benefits of the concepts they learn when the problems presented in teaching materials are related to their everyday life.

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