The implementation of somatic, auditory, visualization, intellectually (SAVI) learning approach to improve students’ attention toward mathematics learning

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Abstract. This research aims to describe the process of implementation Somatic, Auditory, Visualization, Intellectually (SAVI) learning approach to improve students’ attention toward mathematics lesson. The data were obtained from the result of questionnaire and observation. The success indicators in this research was the average of students’ attention reaching 70%. The results of this research showed that learning steps by using SAVI could improve students’ attention, the result as follows; 1) pre-activity: teacher delivered the purpose of the learning, apperception, and motivation. 2) main activity: the teacher explained learning materials, divided students into 4-5 persons to discuss the problem in a worksheet, the teacher guided students to solve the problem, gave chance to present the discussion result, then teacher held games that involve students’ sense tools as training for the learning materials. 3) post activity: the teacher together with students conclude the lesson and ask students to review the lesson at home. Based on the questionnaire result, the average of students’ attention in last cycle is 77.61%.

1. Introduction

Learning is a structured combination including human elements, materials, facilities, equipment, and procedures that influence one another in order to achieve learning objectives [1]. Furthermore, it can be concluded that learning is a process carried out to achieve learning objectives. It can be said that learning must have goals.

Many things affect the achievement in learning. In the learning process, there are cognitive, affective, and psychomotor aspects. One of the things that affects the cognitive characteristics of students is attention [2]. Attention is the activeness of the elevated soul, and even that soul is solely focused on an object or group of objects. To be able to guarantee good learning outcomes, students must have attention to the material being learned. If the subject matter is not a concern of students, then the boredom arises so that the student no longer wants to study [3].

Through attention, a person will absorb what he/she learns or hears. Something that is noticed will go into consciousness or is truly realized by the individual and can last in memory. Attention is a necessary skill for development. It is a common observation that those students excel in life who are able to focus their mind [4]. Attention is very important for learning. Therefore, the teacher must be able to maintain the attention of students when studying.
The problem of the short attention span of students in the learning process was found during the initial observation of the Educational Internship 3 activity at Islam 1 Senior high School Surakarta. When learning mathematics on Monday, September 17, 2018 in the class of X IPS 1, which is at 12:30 - 14:00, students were seen sleeping, occupying themselves with other activities, talking with their friends, and most students did not want to ask to their teacher. Only a few students paid attention, answered questions, from the teacher, did exercises, and took notes.

The short attention span of students can be caused by various things such as the learning process that cannot really attract the attention of students. The short attention span of students is due to the learning process which is only centered on the teacher [5]. Indeed, based on the information from the mathematics teacher, there are difficulties in applying the learning model with complicated steps at Islam 1 Senior High School Surakarta. Thus, the teacher rarely uses cooperative learning models that can be applied in mathematics learning. Students’ attention can be shown in the activities carried out in learning. If students really pay attention to the lesson, then students will follow the learning activities well. Learning activities include listening, looking, touching, smelling, tasting, writing or taking notes, reading, making summaries, observing, remembering, and doing exercises [6]. Students’ attention in Mathematics learning is very important to be improved in classroom learning activities so that students can understand the learning materials presented during the lesson [7]. A classroom with low attention would either stay passive [8], so that passive student will affect their academic achievement because attention are important factors that contribute to students’ academic achievement[9].

One model that fits this description is the Somatic, Auditory, Visualization, Intellectually (SAVI) approach. SAVI learning approach emphasizes that learning must utilize all the sensory devices possessed by students [6]. By using all the senses, the students carry out learning activities. If the activity is carried out during learning, students are expected to be able to show high attention to learning [10]. SAVI approach makes develop the potential of students and learns mathematics optimally with involving learning style is learning mathematics [11]. The use of the SAVI learning approach for students can also increase their understanding of the concepts learned [12], in line with a research which the result is SAVI learning approach can improve student’s mathematics learning achievement [13].

Based on the description of the problems above, the problem statements in this study are: (1) How is the process of learning with the Somatic, Auditory, Visualization, Intellectually (SAVI) approach that can improve students' attention on trigonometry material in the class of X IPS 1 at Islam 1 Senior high School Surakarta of the 2018/2019 Academic Year? and (2) Does the application of the Somatic, Auditory, Visualization, Intellectually (SAVI) learning approach improve students’ attention on trigonometry material in the class of X IPS 1 at Islam 1 Senior high School Surakarta of the 2018/2019 Academic Year?

2. Research Method
This class action research was conducted to improve students' attention on learning mathematics. The subjects of this study were students of the class of X IPS 1 of the 2018/2019 academic year totaling 25 people. The study began in February 2019 until May 2019.

Based on the data used, it is used two methods of data collection. The first is questionnaire method, which is the data collected through the submission of questions / statements to the respondent by scoring according to the Likert scale [14]. The second is observation methods, which is observing the implementation of SAVI learning approach in the classroom. The observers directly observing each meeting in every cycle based on the guidelines observation. To examine the validity of the implemented learning data and students’ attention toward learning is used the triangulation of source [15]. Whereas for data obtained from tests is implemented with the test of content validity.

The indicators of students’ attention used are as follows:
1) Be calm when learning mathematics
2) Study diligently at home
3) Pay attention to the teacher
4) Willingness of the student to ask questions
5) Willingness of the student to answer questions
6) Willingness of the student to take notes
7) Willingness of the student to be active during group discussion
8) Willingness of the student to do assignments
9) Willingness of the student to read
10) Willingness of the student to answer questions on the board from the teacher
11) Willingness of the student to study mathematics at home
12) Willingness of students to do mathematics homework at home

Data collection techniques in this study were done by distributing questionnaire and conducting observation to see the implementation of learning using the SAVI approach. The questionnaires were made of 12 indicators of students’ attention developed into 40 items. After going through the validation process, there were 4 invalid questionnaires so that only 36 questionnaires were used. Analysis of the results of the students’ attention questionnaires began by counting the total of positive items multiplied by the highest score of 4, then adding to the multiplication of the total items with the lowest score of 1. The sum is used as the maximum score to be compared with the scores achieved by students as below.

\[ p = \frac{\text{achievement score}}{\text{maximum score}} \times 100 \]

Note:

\( p \) = percentage of student attention

achievement score = total scores of questionnaire

maximum score = maximum scores of questionnaire

Next, the percentage was categorized according to the qualification results of the questionnaire percentage as in Table 1 [16].

| Percentage       | Category |
|------------------|----------|
| 0% ≤ p ≤ 33,33%  | low      |
| 33,33% ≤ p ≤ 66,67% | medium   |
| 66,67% ≤ p ≤ 100% | high     |

3. Result
From the pre-cycle activities, which is before applying learning with the SAVI approach, the results obtained from the students’ attention questionnaire which are the average percentage of students’ attention is 54.42% included in the medium category. As for the average percentage of 12 indicators, it is obtained of 54.11% with indicators are as follows: being calm when learning mathematics is 57.60%; study diligently at home is 51.25%; pay attention to the teacher is 58.67%; willingness of the student to ask is 55.50%; willingness of the student to answer question is 54%; the willingness of the student to take notes is 63.50%; the willingness of the student to be active during group discussion is 53.25%; willingness of the student to do the assignment is 58%; willingness of the student to read is 51.50%; willingness of the student to answer questions on the board from the teacher is 42%; willingness of the student to study mathematics at home is 49%; willingness of the student to do mathematics homework at home is 55%. 

3
From the results of the pre-cycle, the SAVI approach will be applied in the learning process which is expected to improve students’ attention. Cycle I which consists of two meetings was carried out by applying mathematics learning with the SAVI approach. From the cycle I action, it was found that the average percentage of students’ attention increased by 11.55% to 65.97% and percentage of students’ attention in cycle II being 77.61%. Although the average percentage of students’ attention has increased, but this achievement has not met the indicators of research success that have been set. The indicator of success in this study is that the average percentage of students’ attention should reach a minimum of 70%.

Table 2. Percentage results of students’ attention for each indicator in cycle II

| No. | Students’ Attention Indicators                              | Percentage (%) |
|-----|-------------------------------------------------------------|-----------------|
| 1   | Be calm when learning mathematics                           | 76.60           |
| 2   | Study diligently at home                                   | 73.25           |
| 3   | Pay attention to the teacher                               | 76.50           |
| 4   | Willingness of the student to ask questions                | 76.50           |
| 5   | Willingness of the student to answer questions             | 75.00           |
| 6   | Willingness of the student to take notes                   | 78.00           |
| 7   | Willingness of the student to be active during group discussion | 76.25       |
| 8   | Willingness of the student to do assignments               | 74.00           |
| 9   | Willingness of the student to read                         | 85.00           |
| 10  | Willingness of the student to answer questions on the board from the teacher | 73.50            |
| 11  | Willingness of the student to study mathematics at home     | 83.75           |
| 12  | Willingness of the student to do mathematics homework at home | 85.00        |
|     | Average                                                     | 77.78           |

After the second cycle of action was carried out, the average percentage of students' attention increases when compared to pre-cycle or cycle I. So, for the school, SAVI learning approach can be used as an alternative learning to improve students’ attention. The percentage ratio of each cycle is shown in table 3.

Table 3. Comparison of percentage of students’ attention for each cycle

|                  | Students’ attention average | Students’ attention average based on the indicators |
|------------------|-----------------------------|---------------------------------------------------|
| Pre-Cycle        | 54.42%                      | 54.11%                                            |
| Cycle I          | 65.97%                      | 64.95%                                            |
| Cycle II         | 77.61%                      | 77.78%                                            |
Based on table 3, the comparison of the percentage of students' attention can be seen in the following diagram

![Percentage of students' attention diagram](image)

Figure 1. The increasing diagram of students’ attention percentage

4. Discussion

The SAVI approach gives students the opportunity to maximize the use of their senses so that students' attention in learning can be maximized because their learning activities are also maximal [7]. The results of the first cycle were not optimal due to the implementation of the SAVI approach in the first cycle which was not optimal because there were stages that had not been done well by students. At the delivery stage, the worksheets that should be done in group just done individually. Some students do not take the opportunity to discuss that makes them understand the learning material. Here, teacher must be more active to monitor the students and direct them to be active in discussions. So that, the action will be continued for the next cycle by reflecting the deficiencies and obstacles that occurred in cycle I. In cycle II the learning activities were carried out by

1) Emphasizing the teacher to be more assertive in conditioning students.

2) The asking technique used by the teacher is by pointing several students in turn to answer if there are many students who don’t dare to answer.

3) The teacher motivates students to work together with others and share knowledge also give same attention to all students.

4) The teacher provokes students to be able to make conclusion from learning activities by answering question from the teacher.

5) The teacher explains the rules of game better, can be done by doing simulations before the real game begins.

After the second cycle done by reflection from resistance of cycle I, the average percentage of students' attention was 77.71%, which means an increase of 11.64%. The percentage has met the success indicator of the research.

Based on the results, can be known that the percentage of students with high attention has exceeded 70% after after implementation with SAVI learning approach done in two cycle. The actions in cycle II that led to the achievement of research success indicators were carried out based on the reflection of cycle I actions, so that deficiencies in cycle I were no longer found in cycle II activities. One of them in the second cycle activities students are more familiar with the activities of implementing the game, because the teacher explains the rules followed by simulation.

Based on the results obtained it can be said that learning with the SAVI approach can increase student attention and learning outcomes. The learning process that can improve student attention and learning outcomes is carried out with the following stages based on SAVI stages [15].
1. Introduction (Preparation Stage)
   a. The teacher conditions the class so that students are ready to learn
   b. The teacher conveys the learning objectives and approaches to be used
   c. The teacher reminds students of the material that was learned as a prerequisite material in the material that day.

2. Main Activities (Delivery and Training Stage)
   a. The teacher divides students into groups, one group containing 4-5 people.
   b. The teacher distributes student worksheets to each group
   c. The teacher gives direction to the students in doing the worksheets.
   d. Students in groups find the concepts learned.
   e. The teacher gives guidance to students when completing the worksheets
   f. The students present the results of the discussion in front of the class.
   g. The teacher gives the opportunity for other students to respond to the results of the group work being presented
   h. The teacher gives an explanation and emphasis on the material that has been learned
   i. The teacher explains the rules of the game
   j. The teacher leads the game and determines the winner in the game
   k. The teacher gives rewards to the group that wins the game.

3. Closing (Submission Phase)
   a. The teacher guides students to summarize or make conclusions about the material being learned. (intellectual)
   b. The teacher asks students to study the material at the next meeting
   c. The teacher closes the learning activity.

4. Conclusion
   Based on the results, it can be seen that from the application of learning using the SAVI approach (Somatic, Auditory, Visual, Intellectual) to improve students’ attention of the class of X IPS 1 at Islam 1 Senior High School Surakarta of 2018/2019 academic year, it can be concluded that: (1) learning steps with the SAVI approach which can improve student attention are: 1) introduction: the teacher conveys learning goals, apperception, and motivation. 2) main activities: the teacher briefly explains the material being studied, divides students to 4-5 people in each group to discuss the worksheet, the teacher monitors and guides students in problem solving, gives several groups opportunities for presentations, then the teacher plays games that involve students’ senses as training on the material presented. 3) Conclusion: The teacher gives conclusions from joint learning with students and asks students to relearn the day's learning. (2) the application of learning with the SAVI approach can improve students’ attention on mathematics learning.

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