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The Effect of SAVI Learning Model on Students' Critical Thinking Skills

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ABSTRACT

This research aims to determine the effect of the SAVI learning model on the critical thinking skills of junior high school students. The method used in this research is one group pre-test-post test, with a descriptive quantitative approach. The test is done online via a google form. The question instrument contains 10 multiple choice questions and 5 questions on the description of the digestive system material that has been validated by the validator. This study involved 90 students of grade 8. The results showed that the validation results of critical thinking test questions obtained a mode 4 score and a reliability value of 86%, while the results of the students' critical thinking skills test showed that after the SAVI learning model was applied there was an increase obtained from the average pretest score of 40 and the average score The post-test average was 81 so that the N-gain score increased by 0.68 in the medium category, and all critical thinking indicators were achieved well.

INTRODUCTION

In the 21st century, Indonesia faces various challenges. Demands and challenges call for various breakthroughs in thinking, drafting concepts, and actions (Roudlo, 2021). In the education, it is required to answer the 21st-century challenges which can produce graduates who have 6C abilities, one of which is critical thinking is expected to be achieved by graduates where an important goal in critical thinking is the students are able to think deeply, logically, able to collect and evaluate evidence (Tang et al., 2020). Critical thinking skills in education are considered as the important point because through critical thinking skills students can prepare themselves for future situations and conditions. This is supported by the statement (Cahyono, 2017) that critical thinking skills are very important skills for the success of learning, working, and living in the 21st century.

Critical thinking skills are an organized process that allows students to evaluate evidence, assumptions, logic, and language that underlie other people's statements (Johnson, 2012). However, educational activities are currently experiencing obstacles due to Covid-19 which is also attacking Indonesia, the government must make a temporary policy to implement online learning in order to reduce the spread of the virus. This condition affects the critical thinking skills of students who are required to survive, adapt in order to be able to follow the learning process with the new system, students are required to be used to the online system thus they can even follow all learning. Before Covid-19, The data results from the 2018 PISA-related to the ability to think analytically and solve the problems, Indonesian children are still relatively low compared to children in other countries. Indonesia occupies the 74th position out of 79 countries (Schleicher, 2018). Meanwhile, according to Afnia (2021), learning styles also affect students' critical thinking skills. Teachers have to be able to deliver interesting lessons to build understanding and encourage students' ideas. Building this

understanding, it is influenced by the learning style of each student. This is in accordance with Karim's (2014) research that each student has a different learning style. Therefore, teachers must have creativity in delivering subject matter in order to create a fun teaching and learning process and can train students' critical thinking skills in order to equip students to be able to face the challenges of the coming century. One of them is by selecting the right learning model.

The choice of learning model is very influential on the learning outcomes themselves (Arends, 2012). The right learning model can make students construct their knowledge independently because constructivist theory stated that the teacher only helps the process of finding new information to make it meaningful, then the students themselves will construct new ideas or concepts based on the experiences they get (Baharuddin, 2015). In this study, an analysis will be carried out to determine the effect of the SAVI learning model on students' critical thinking skills. Teachers as the main component in learning have a role to provide constructive motivation and are able to create a learning atmosphere that is in accordance with the characteristics of students (Tari et al., 2020). Given that the characteristics and learning styles of each individual are different, the teacher must be able to create representative learning for different student learning styles (Rahmawati et al., 2014). SAVI is a learning model that combines physical movement, intellectual activity, and uses all the senses possessed by students in solving problems (Sutrisno et al., 2013). This learning model is appropriate for all learning styles, both kinesthetic, visual, and auditory learning styles. This is because the SAVI learning model principally emphasizes that all senses owned by students have to be worked when learning (Rahmawati et al., 2014).

The combination of the four elements of SAVI can stimulate students to think critically by involving the kinesthetic and five senses in learning (Iskandar, 2016). In line with the research of Fitriyani et al. (2015), it stated that the SAVI learning model which includes somatic, auditory, visual, and intellectual can help improve students' critical thinking skills. So that the SAVI learning model is more optimal to train students' critical thinking skills. In accordance with the results of research by Francisca (2019), the use of the SAVI learning model has a positive effect on students' critical thinking skills when compared to the Jigsaw cooperative model. According to that statement, it is expected to know the effect of the SAVI learning model on students' critical thinking skills.

RESEARCH METHOD

General Background

This research refers to the 4-D model (four-D model) consisting of define, design, develop, and disseminate. The trial design is one group pretest-post test, with a descriptive quantitative approach. Descriptive research aims to describe the situation or phenomenon as it is without manipulating the object of research (Sukmadinata, 2015). The test instrument consists of 10 multiple choice questions and 5 description questions.

Sample

This research was conducted on 90 8th grade students of State Junior High School of 21 Surabaya, East Java, Indonesia. It will be held for the 2021/2022 academic year in even semesters.

Instrument and Procedures

The instruments in this study were validation sheets and test sheets including pretest-posttest which were used to measure critical thinking skills. The results of the pretest-posttest were collected using a Google form. The procedures for this research are as in Figure 1.

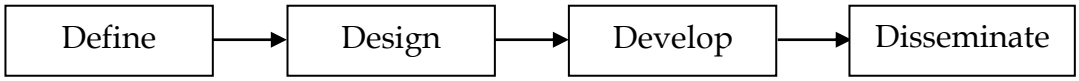

Figure 1. Flowchart of the Four-D Model.

Data Analysis

The data of this study were obtained from the results of the validation and the results of the critical thinking skills test. The validation assessment uses a Likert measurement scale of 1-4. The score of the validation results is calculated using the mode calculation, then the criteria score obtained is then interpreted using the interpretation criteria of the validity score. The following is the Likert scale assessment criteria Table 1.

Table 1. Criteria for interpretation of validity score.

Score	Category
1	Not Valid
2	Quite Valid
3	Valid
4	Very Valid

(Adapted from Riduwan, 2013)

Students are determined to be complete if they reach the minimum completeness criteria (KKM) set by the school in science subjects, namely 76. Student learning mastery for critical thinking skills tests can be calculated using the following equation:

$$Score = \frac{\Sigma\ score\ optained}{\Sigma\ maximum\ score} x\ 100$$

The results of completeness can be used as supporting data to find out whether students are stimulated by critical thinking skills or not. The results obtained, were then analyzed using the N-gain score (normalized increase score) to determine changes in students' critical thinking skills before and after learning with the SAVI learning model. The following equation is based on the normalized gain score:

$$< g >= \frac{\% < S_f > - \% < S_i >}{\% < s_{max} > - \% < S_i >}$$

Description :

<g> = normalized gain

S_f = final test score (post-test)

S_i = initial test score (*pre-test*)

S_{max} = maximum score

The results of these calculations are then converted into qualitative values according to the assessment in Table 2.

Table 2. N-gain score.

Limitation	Category
(<g>) > 0,7	High
0.7 > (<g>) > 0,3	Medium
(<g>) < 0,3	Law

Students are stated having developed their critical thinking skills if students experience increased learning outcomes from the tests given even though they have not reached the minimum completeness criteria specified at school. To find out the differences of SAVI learning model application in each class, a hypothesis test is conducted to determine the differences among 8H, 8I, and 8J classes. To determine the correct hypothesis test, a normality test is carried out first.

RESULTS AND DISCUSSION

The results of the study were compiled based on the results of the validation of the questions and the results of the critical thinking skills test through the pretest and posttest. The results of the validation of the question instruments used are as in Table 3.

Table 3. Results of question validation.

Rated aspect	Score			Mode	Criteria
	V_1	V_2	V_3		
The suitability of the items with the indicators of critical thinking skills	3	4	3	3	Valid
Clarity of orders to work on questions	3	4	4	4	Very Valid
The content of the material can measure students' critical thinking skills	3	4	4	4	Very Valid
The question sentence does not have a double meaning	3	4	4	4	Very Valid
The questions given are in accordance with the material	3	4	4	4	Very Valid
Relationship pictures or tables according to the question	3	4	4	4	Very Valid
Use good and correct language	3	3	4	3	Valid
Total				4	Very Valid

The validation of critical thinking test questions was carried out by three expert lecturers. A good test has the main characteristics, among others, reliable (reliable), valid or valid, objective, and practical (Hariyanto & Basuk, 2015). However, this study only uses validity and reliability the terms. In addition, the test is stated to be valid if the test can provide appropriate information and can be used to achieve certain goals (Oktanin W. & Sukirno, 2015). Item validity needs to be looked for to find out which questions are not feasible and cause low validity (Utomo, 2018). Based on Table 3 the results of the validation questions, all aspects got a good score, namely two aspects got a mode score of 3 with a valid category, namely the aspect of indicator preparation and language use, while the other five aspects got a mode score of 4 with a very valid category. The selection of indicators in the preparation of pretest and posttest questions is still not appropriate, so it is necessary to adjust and justify the indicators so that students' critical thinking skills can be measured. Rationally, the validity of the instrument can be seen from the suitability of the content of the questions with the material and indicators (Oktanin W. & Sukirno, 2015).

In addition, the language aspect also obtained mode 3 with a valid category. This is because the language used in the writing of the questions still results in multiple interpretations. Good questions besides being valid must also use good language and sentences that do not cause double meanings so that students have no difficulty in answering questions. This is in accordance with the Ministry of Education and Culture

(2018) regarding the preparation of questions which states that each question uses language that is in accordance with Indonesian language rules and uses communicative language. According to Nuriana et al. (2015), communicative sentences need to be used because otherwise, the reader may misunderstand the sentences made, resulting in students answering incorrectly. This is in line with Hanifah N.'s opinion (2014) that the difficulty level of the test is caused by the complexity of the test subjects and the conditions of the answer choices because tests often confuse students and alternative answers are homogeneous or sentences that are too difficult to understand.

Based on the results of the overall validity of the critical thinking test questions, the score was good, namely getting a mode score of 4 and a reliability value of 86%. With the interpretation of the mode and reliability values obtained, the developed device is categorized as very valid, reliable, and suitable to be used to measure students' critical thinking skills. The pretest and posttest questions were given to three classes, namely class 8H, 8I, and 8J. The results of overall critical thinking skills are presented in Table 4.

Table 4. Critical thinking skills test recapitulation.

Class	Pretest Score	Posttest Score	N-gain	Category
8H	47	82	0.66	Medium Increase
8I	39	81	0.69	Medium Increase
8J	34	79	0.68	Medium Increase
Average	40	81	0.68	Medium Increase

Based on the results of the critical thinking skills test in Table 4 shows that the learning outcomes of class VIII students obtained from the pretest and posttest have increased with an average N-gain score of 0.68 which is included in the medium category. This shows that learning using the SAVI model tool can practice critical thinking skills. This is in line with the research of Rosidah et al. (2020) that there is an increase in critical thinking aspects of the knowledge of SD 1 Pelemkerep students after the application of the SAVI learning model assisted by KAPINDO media with a medium category. The results of other studies that also support this research are the results of research by Azizah et al. (2016) which states that student learning outcomes after SAVI is applied have increased and learning objectives have been achieved well.

The increase in the N-gain value that occurred was due to the different learning processes obtained by students, previously using conventional models and not being modified with innovative learning models. The choice of learning model is very influential on the learning outcomes themselves (Arends, 2012). The learning model will affect the results and interest in learning, especially the ability to think critically. This is in line with the research of Fitriyani (2015) that there is a significant difference in science critical thinking skills between students who take lessons with the SAVI learning model and students who take lessons with conventional learning models.

Each class had enhancement in the value of N-gain, but we are not able to determine the differences in the application of the SAVI learning model in each class, therefore a hypothesis test was conducted to determine the differences among 8H, 8I, and 8J classes. To determine the appropriate hypothesis test, a normal test is carried out first. The following table gives the results of normality test is presented in Table 5.

Table 5. Tests of normality.

Class	Kolmogorov-Smirnov[a]		
	Statistic	Df	Sig.
Class 8H	,158	30	,056
Class 8I	,113	31	,200*
Class 8J	,208	29	,002

Based on Table 5 8H and 8I Classes are distributed normal (0.056> 0.05 and 0.200> 0.05), otherwise 8J class was not normally distributed (0.02 <0.05). Due to The existence of values that are not normally distributed, the type of hypothesis test used is the non-parametric Kruskal Wallis test. The following results from the Kruskal Wallis test are presented in Table 6.

Table 6. Test of Kruskal Wallis.

	Postest
Kruskal-Wallis H	3,337
Df	2
Asymp. Sig.	,189

According to Table 6 the results of the Kruskal Wallis test, shows Asymp. Sig. > 0.05, which is 0.189, so the conclusion is H0 is accepted, which means that there is no difference in the application of the three classes and they are consistent between classes 8H, 8I, and 8J. The SAVI learning model emphasizes that learning must utilize all the senses possessed by students, emphasizing learning on student involvement as a whole in the learning process (Meier, 2005). Learning that involves emotions, the whole body, all the senses, and personal abilities, respect–other individual learning styles by realizing that people learn in different ways, can stimulate students to think critically by involving kinesthetics and the five senses in learning (Iskandar et al., 2016).

In addition, it is seen from the four elements of the SAVI learning model which consists of somatic, auditory, visual, and intellectual. Where somatic learning trains students to evaluate knowledge by doing an activity. Auditory learning trains students to ask questions, argue, and evaluate knowledge based on a collection of information obtained during auditory learning. Visual learning trains students to evaluate knowledge by seeing it directly. Finally, intellectual learning trains students to process evidence through evaluation, making decisions, and solving problems (Meier, 2005). So all of that can hone students' critical thinking skills. Because the characteristics of students who develop critical thinking skills are being able to collect as much information as possible, combine information, find patterns, compile explanations, make generalizations, and document findings based on evidence (Eggen & Kaucak, 2012).

Table 7 shows the results of the achievement of the Critical Thinking indicator on the pretest were not achieved. Of the five critical thinking indicators achieved by students, building basic skills gained the highest percentage when posting. This is because students are not able to use their thinking in studying something by considering whether the source of information is acceptable or not. This SAVI learning model has the principles of skills which include communication, teamwork, problem-solving, initiative, and effort. These skills make the SAVI learning model able to provide space for students to develop indicators of critical thinking skills, so that they

can train students to distinguish between truth and facts, facts and opinions, knowledge and beliefs through logical proof and correct logic by utilizing somatic, auditory, visualization, and intellectual survivors of the learning process (Fitriyani et al., 2015).

Table 7. Achievement of critical thinking indicators.

Indicators	Percentage			
	Pretest	Category	Posttest	Category
Elementary clarification	38	Less accomplished	69	Accomplished
Advance clarification	0	Not accomplished	76	Accomplished
Inference	43	Quite accomplished	77	Accomplished
Basic support	26	Less accomplished	92	Very accomplished
Strategies and tactics	32	Less accomplished	83	Very accomplished
Average	28	Less accomplished	80	Accomplished

The indicator giving a simple explanation was achieved by the students with the lowest percentage. The problem given in this aspect is to ask students to answer questions and give examples of enzymes in the digestive system. However, students are still often confused in understanding the differences between each enzyme in the digestive system. This possibility can occur because students need a lot of study time to handle learning activities effectively (Nisak M. K. & Wartono S., 2017). This is in line with Yuliati's (2013) research which states that teaching critical thinking requires practice to have it. From the results obtained, it can be concluded that the use of the SAVI learning model can train students' critical thinking skills.

CONCLUSION

Based on the results of the study, it can be concluded that the results of the validation of critical thinking test questions obtained a mode score of 4 and a reliability value of 86% with a very valid and reliable category so that the questions were declared feasible to be used to measure students' critical thinking skills. The results of the student's critical thinking skills test showed that there was an increase in the pretest average score of 40 and the posttest average score of 81 the N-gain score increased by 0.68 in the medium category. The implication of this research is that the SAVI learning model is included in the criteria of validity, both content and construct so that it can be used as a guide in improving students' critical thinking skills. In addition, the learning process makes students active in learning because the SAVI approach is a learning that activates all senses, not just intellectuals. Future research is expected to use more data to obtain more detailed results regarding students' critical thinking abilities. The existence of different material topics is expected to contribute to improving students' critical thinking skills.

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