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THE EFFECT OF SAVI (SOMATIC, AUDITORY, VISUAL, INTELLECTUAL) LEARNING MODEL ASSISTED BY QUIZWHIZZER EDUCATIONAL GAME ON MATHEMATICAL CREATIVE THINKING ABILITY OF GRADE V ELEMENTARY STUDENTS

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Abstract *- The research was conducted to see the effect of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game on mathematical creative thinking ability in fifth grade students of SD Negeri 1 Amadanom. Researchers used a quantitative approach with a quasi-experiment method. Researchers sampled VA class as an experimental class applied SAVI learning model assisted by Quizwhizze educational game totaling 18 students and 18 VB class students as a control class through traditional learning through non-probability sampling technique. Data on mathematical creative thinking skills of grade V students were obtained based on the achievement of post-test scores. The results of data analysis showed that the average post-test score in the experimental class was 76.00 while the control class was 48,66. The results of data acquisition will be applied through the t test or Independent-Sample T Test assisted by the SPSS for Windows 26 program. Based on the conclusion of the t test analysis, the significance value (2-tailed) is 0.000, so that 0.000 <0.05 is obtained. The findings of this study indicate the influence of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game which results in increasing the mathematical creative thinking ability of fifth grade students of SD Negeri 1 Amadanom.*

Keywords *- SAVI; Quizwhizzer educational game; mathematical creative thinking*

I. INTRODUCTION

Educational technology plays an important role in improving the learning process. Now the existence of technology is a major concern in the world of education with the aim of technology being able to become a new foothold in helping teachers and students overcome problems in the learning process. Educational technology is an approach that provides space to create an optimal and systematic learning environment (Miasari, et al., 2022). Educational technology has benefits as a tool and service in creating a more developed education system. According to Abdhulak & Darmawan in (Pustikayasa, et al., 2023: 5) the development of educational technology continues to progress according to the needs in the field as an enhancer of the effectiveness of the learning process. By involving technology in the learning process, learning activities can take place more relevantly and effectively. This can be a starting point for developing more interesting and fun learning. Educators can utilize existing technology into the learning process. Learning in the independent curriculum contains mathematics content. Mathematics is a teaching material that has an important role in the education system. The benefits of learning mathematics to students can help them have proficiency in higher-level thinking, especially mathematical creative thinking Marliani in (Sari & Hasanudin, 2023).

Creative thinking is the ability to utilize the thinking process to generate new ideas in solving a problem (Hassoubah) in (Darwanto, 2019). According to (Darwanto, 2019) there are four indicators of creative thinking including fluency, flexibility, extension, and uniqueness. Creative thinking skills according to (Silver, 1997) cited in (Minarsih, Suastika, & Sesanti, 2020) there are indicators of creative thinking including (1) Fluency, students are able to create new ideas and have solutions. (2) Flexibility, students can produce diverse solutions or ideas and are able to see problems from various perspectives. (3) Originality, able to create new ideas that are unique and able to provide answers that are different from others. According to Munandar in (Utami, Endaryono, & Djuhartono, 2020) fluency in creative thinking is very important to continue to be trained because creative thinking means having the expertise to find a variety of answers to an existing problem, where the emphasized aspects are quantity, relevance, and diversity of correct and varied answers. Therefore, it is important to increase the fluency of creative thinking in each learner as a provision to face the complex challenges of life.

Mathematical creative thinking proficiency is defined as the fluency of creative thinking in the field of mathematics to help students participate in creating new ideas and being able to solve a mathematical problem that is relevant to students' lives. Mathematical creative thinking skills are one of the four 21st century skills (Rahayu, Liddin & Maarif, 2022). Mathematics learning must have fluency in mathematical creative thinking so that students are able to produce new solutions to the difficulty of understanding open mathematics material. According to Ausubel in (Utami, Endaryono, & Djuhartono, 2020) suggests that learning must foster skills in creative thinking in students. Mathematical creative thinking has a crucial role in every student so it needs to be presented and developed through habituation in mathematics learning.

Based on observations in the fifth grade of SD Negeri 1 Amadanom when implementing mathematics learning. The learning process in grade V students is still not centered on increasing the capacity of students' creative thinking skills. In learning activities educators have not utilized a variety of learning models. learning activities carried out by educators focus more on completing the material so that learning tends to be monotonous and less meaningful. Students are less given the opportunity to explore learning materials such as finding solutions in different ways than what has been taught. Researchers also conducted conversations with fifth grade teachers, the results showed that in addition to the lack of use of varied learning models, tools such as technology-based media or games were very rarely done. Because of the limitations that teachers have regarding the manufacture and use of media, especially technology-based media. Teachers revealed that the facilities for technology-based learning activities at school are very adequate, but they are hampered by the abilities of teachers.

An alternative in solving the above problems is through the application of interactive learning models that can be in accordance with student learning needs. The SAVI (Somatic, Auditory, Visual, Intellectual) learning model is one of the learning models by involving all senses and physical activities of students (Yohani, Rakhmat, & Mulyana, 2014). The SAVI (Somatic, Auditory, Visual, Intellectual) learning model contains important components to facilitate students to achieve their learning needs. Important components in SAVI learning consist of (1) somatic is learning by involving physical activity, (2) auditory is learning through listening, (3) visual is learning by involving the sense of sight, and (4) intellectual is learning by involving the ability to think (Purba & Sarminta, 2022). By optimizing students' senses and thinking fluency in learning activities, the learning process that takes place is more meaningful.

According to the theory of Accelerated Learning, the SAVI (Somatic, Auditory, Visual, Intellectual) learning model is based on the main principles including, learning activities involve the senses and thinking power, learning activities are activities to obtain new ideas not centered on the delivery of results, the learning process can be helped by working together, the learning process occurs from various levels together, learning is created from tasks that are done independently, positive emotional improvement can affect learning, the image brain can absorb information implicitly (Yohani, Rakhmat, & Mulyana, 2014). Dave Meier in (Yohani, Rakhmat, & Mulyana, 2014) revealed that the SAVI (Somatic, Auditory, Visual, Intellectual) learning model is implemented through four phases consisting of, 1) preparation, 2) delivery, 3) training and 4) appearance of results. Through the application of the SAVI learning model (Somatic, Auditory, Visual, Intellectual) provides fluency to students to understand the core material of abstract learning, students' proficiency in creative thinking can also increase, because the SAVI learning model collaborates learning styles between physical, auditory, visual, and intellectual it helps attract students to get involved during

learning activities and receptive to varied ideas. So that in the end students will feel a more meaningful learning experience and train their creative thinking skills (Kencanawati, Sariyasa, & Hartawan, 2020). To support the implementation of the SAVI learning model, educators need to take advantage of technological developments in learning activities such as the utilization of technology-based educational games.

Educational games are games that have been developed exclusively to help achieve learning objectives (Windawati & Koeswanti, 2021). The purpose of educational games as a tool to increase students' enthusiasm for learning material packaged in games so that in the end students can learn with a feeling of pleasure with the hope that students are able to understand the material taught in the learning process (Windawati & Koeswanti, 2021). Quizwhizzer educational game is an interactive quiz-based game that can provide convenience for educators in improving students' thinking skills (Dwi Nursafitri, Hartini, & Rohmadi, 2024). Quizwhizzer educational game is a learning media by realizing positive interaction between students in learning activities through games (Faijah, Nuryadi, & Marhaeni, 2022). The Quizwhizzer platform can train students in improving their creative thinking skills. The utilization of Quizwhizzer on the fluency of creative thinking can be implemented through the presentation of non-routine questions that require thinking outside the habits of students so that in the end students are encouraged to look for alternative solutions from different points of view, encouraging students to find various possible answers (Kumala et al., 2024). This can be an alternative in helping students improve their creative thinking skills with the help of Quizwhizzer educational games.

In line with the studies that have been analyzed by (Kumala et al., 2024) with the research title "HOTS-Based e-evaluation Quizwhizzer in science learning in elementary schools" shows that Quizwhizzer can foster high-level thinking skills, especially in creative thinking through HOTS questions. According to the findings by (Kencanawati, Sariyasa, & Hartawan, Y. 2020) with the research title "The Effect of SAVI Learning Model on Mathematical Creative Thinking Ability" shows that the SAVI learning model is able to train mathematical creative thinking skills with the average final value of the experimental class post-test increasing more than the control class.

With regard to the explanation of the background of the problem, the researcher will conduct research with a quantitative approach and experimental research method with the research title "The Effect of SAVI Learning Model (Somatic, Auditory, Visual, Intellectual) Assisted by Quizwhizzer Educational Game on Mathematical Creative Thinking Ability of Grade V Elementary Students". This research has benefits including increased student involvement, training creative thinking skills, renewal in learning activities, meaningful learning experiences, and increasing student activeness, especially in mathematics learning materials. This research has a novelty from previous research, such as research by (Kencanawati, Sariyasa, & Hartawan, Y. 2020) entitled "The Effect of SAVI Learning Model on Mathematical Creative Thinking Ability" the novelty carried out by researchers lies in the addition of tools to variable X, namely the Quizwhizzer educational game and research conducted by researchers at the elementary school level with a quantitative approach. In addition, this study is intended to see whether there is an effect of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game on mathematical creative thinking skills in fifth grade students of SD Negeri 1 Amadanom.

II. METHOD

This study was conducted to examine the positive effect of applying the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game on the mathematical creative thinking ability of fifth grade students at SD Negeri 1 Amadanom. Researchers used a quantitative approach and a Quasi Experimental Design research method using a non-equivalent control group design. According to (Waruwu, 2023) quantitative is an approach that can be measured statistically through calculations used in answering research hypotheses. According to (Ramdhan, 2021) the experimental method is a predictive investigation, which estimates the effect of manipulation or influence on a dependent variable. The experimental method aims to collect data or information about the effects of a treatment carried out on two groups consisting of an experimental class that is given treatment and a control class, namely a class without treatment. The sample taken by researchers amounted to 40 students using a non-sampling technique, namely saturated sampling through drawing to determine two class groups as experimental and control classes. The variables of this study consisted of independent variables, namely the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by Quizwhizzer educational games and the dependent variable of mathematical creative thinking ability.

Researchers collected research data through test questions and observations, the tests carried out by researchers consisted of two phases, namely the first phase before being given treatment researchers gave a test in the form of a pre-test question to recognize the basic capacity of students. Then the researcher gave a test in the form of a post-test question in two class groups to determine the impact of the treatment that had been carried out. The results of the pre-test and post-test questions from the two class groups can be concluded to show whether there is an effect of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game on students' mathematical creative thinking skills. Researchers conducted direct observations on fifth grade students of SD Negeri 1 Amadanom as the object to be studied in the implementation of learning in the classroom. Researchers made observations to see how the implementation of learning was applied to the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by Quizwhizzer educational games with the aim of seeing an increase in students' mathematical creative thinking skills.

Researchers used a research instrument test before the research instrument was implemented. The instrument test used by researchers consists of instrument validity test and instrument reliability test. After the research instrument is tested for validity and reliability, the data will be analyzed through a prerequisite test consisting of normality test and homogeneity test. The hypothesis test aims to analyze the differences that occur from two class groups, namely the experimental class that received treatment using the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game and the control class without any treatment or conventional learning. Each instrument test and research data analysis was carried out with the help of SPSS for Windows 26.0.

III. RESULT AND DISCUSSION

A. Result

The researcher conducted a quasi experiment research method at SD Negeri 1 Amadanom in class V on the subject of the area of trapezoidal flat shapes. This research is divided into two class groups, namely classes VA and VB with a total of 20 students each. However, when the research was conducted each class only had 18 students because 2 others were unable to attend due to illness, the two class groups were the samples used by researchers. Researchers used an essay question instrument with a total of 5 items with the aim of testing students' fluency in mathematical creative thinking. Researchers conducted an instrument validity test which aims to analyze the validity of a research instrument. The criteria for instrument validation in this study are if rcount> rtable at the sig level of 0.05 then the research instrument can be declared valid. Based on the r table in this study obtained N = 18 at the significance level of 0.05, the r table value was obtained 0.468.

Table 1. Validity Test Results

Question	*Corrected Item - Total Correlation*	Nilai r table *Product Moment*	Information
Question 1	0,729	0,468	Valid
Question 2	0,883	0,468	Valid
Question 3	0,722	0,468	Valid
Question 4	0,720	0,468	Valid
Question 5	0,729	0,468	Valid

Based on the results of data processing in table 1, it is stated that 5 questions have rcount> 0.468, based on this, the research instrument is declared valid and suitable for application in research. After the implementation of the next study, the researcher conducted a hypothesis test to see the difference in treatment in the experimental class and control class statistically and see the effect of the stimulus that had been given. Researchers used Independent Sample T-Test or t-test with a significance level of 5% as for the provisions of hypothesis testing in this study, if the significance (2-tailed) > 0.05, then H0 is accepted and Ha is rejected. Conversely, if the significance value (2-tailed) <0.05, then H0 is rejected and Ha is accepted.

Table 2. Hypothesis Test Results

	Independent Samples Test		
		Sig (2-*tailed)*	Level of Significance
Post test results	*Equal variances assumed*	0,000	0,05
	Equal variances not assumed	0,000	0,05

The results of the hypothesis testing analysis above obtained a significance value (2-tailed) of 0.000, so obtained 0.000 <0.05. This means that H0 is rejected and Ha is accepted, so the findings of this study indicate that there is an effect on improving mathematical creative thinking skills by applying the SAVI (Somatic, Auditory,Visual, Intellectual) learning model assisted by educational games to fifth grade students at SD Negeri 1 Amadanom.

B. Discussion

The purpose of the study that has been carried out at SD Negeri 1 Amadanom is to determine the effect of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game on the mathematical creative thinking ability of grade V students in the field of trapezoidal flat building material. Researchers analyzed the difference in the final results on the post-test scores of the two class groups. The average post-test score in the experimental class was 76.00 and categorized as creative, while the control class was 48.66 categorized as less creative. These final results show that the post-test value of the experimental class is more improved than the control class, this situation is because the experimental class is given a treatment through the process of applying the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by the Quizwhizzer educational game. Based on the results of hypothesis testing, the sig (2-tailed) value is 0.000, so that 0.000 <0.05 is obtained. So these findings indicate that Ha is accepted and H0 is rejected, this means that there is a positive impact on the mathematical creative thinking skills of fifth grade students in the field of mathematics through the application of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by Quizwhizzer educational games during learning activities. In line with the findings carried out by (Nainggolan et al, 2021) that the application of the SAVI learning model (Somatic, Auditory, Visual, Intellectual) is the realization of the syntax of the SAVI learning model (Somatic, Auditory, Visual, Intellectual) which is divided into four phases including preparation, delivery, training, and finally the appearance of results. Researchers saw that there was an increase in the average final results of the experimental class test more improved than the control class, these results showed that the influence of learning motivation and creative thinking skills possessed by students.

The SAVI (Somatic, Auditory, Visual, Intellectual) learning model integrated in the learning process is considered effective because this model involves all learning styles that students have, focuses on the student center so that students are not passive during learning activities, realizing learning experiences that are relevant to student needs. This is in line with the advantages of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model according to (Nurhasanah, Hopeman, & Jakfar, 2024), namely first, the SAVI (Somatic, Auditory, Visual, Intellectual) learning model involves four learning strategies, namely increasing knowledge by involving physical activities, listening, seeing, and thinking skills. Second, learning is more meaningful and interesting. Third, it increases cooperation between students. Fourth, it encourages students to develop their own knowledge. Fifth, students can be creative in finding solutions to problems. Like the study conducted by (Amalia, Adiman, & Hastuti, 2020) the SAVI (Somatic, Auditory, Visual, Intellectual) learning model has a positive impact on increasing the effectiveness of student learning activities as reflected in the average final test in the experimental class which is more improved than the control class.

By applying the syntax of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model that is coherent in learning activities it is possible to assist in improving students' mathematical creative thinking skills. The syntax of the SAVI learning model (Somatic, Auditory, Visual, Intellectual) includes, first, preparation where in this syntax invites students to carry out physical activities such as ice breaking which is related to the learning material that will take place with the aim that students can be in a comfortable and stable condition to carry out learning. This syntax also provides stimulative questions to find out the initial condition of students and revive students' memories of the previous material. So that students are facilitated to be able to express ideas through their own language (Ma'ruf & Syaifin, 2021).

The second syntax is delivery, at this syntax the stage where providing explanations is interesting and relevant by involving all senses and thinking skills through the use of visual media to make it easier for students to understand the learning material. At this stage students will be facilitated to do questions and answers so that there will be a diversity of questions and answers from students. The third syntax is training, where in this syntax students are trained on cognitive and psychomotor aspects through group discussions. In this syntax students will be divided into several small groups to make trapezoidal flat shapes from flat shapes and make questions and answers about the trapezoid area in groups (Nurhasanah, Hopeman, & Jakfar, 2024).

The last SAVI (Somatic, Auditory, Visual, Intellectual) learning model syntax is the appearance of results, where this syntax facilitates students to be able to develop and implement cognitive and psychomotor aspects through group presentations. At this stage, students are facilitated in the ability to express their own opinions through discussion and question and answer process (Sari, Sofiyan, & Amalia, 2021). In addition, at this stage students will work on interactive quiz-based educational games that aim to be able to improve students' mathematical creative thinking skills. With interactive quiz-based games, students' abilities will be facilitated because educational games can be designed by providing HOTS questions that involve auditory, visual and intellectual. Each syntax of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model must involve important components of the SAVI (Somatic, Auditory, Visual, Intellectual) learning model including Somatic, Auditory, Visual, Intellectual, so that it can accommodate students' learning styles.

The results of this study are in line with (Veriansyah, 2022) and (Ningsih, Dedy, & Putra, 2022) who argued, the results of the academic value of the post-test value of the experimental class that received treatment in the form of SAVI (Somatic, Auditory, Visual, Intellectual) learning model showed a significant effect compared to the control class through conventional learning. Based on the findings of the study above, the SAVI learning model (Somatic, Auditory, Visual, Intellectual) also has an impact on subjects other than mathematics. In line with the study conducted by (Nada & Sitepu, 2023) the SAVI (Somatic, Auditory, Visual, Intellectual) learning model has an impact on student knowledge development. This situation shows that the

SAVI learning model (Somatic, Auditory, Visual, Intellectual) not only has an impact on increasing student knowledge but can affect student learning activities judging from the questionnaire student activity increases.

SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by Quizwhizzer educational game can support the learning process so that it is not monotonous. The SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by Quizwhizzer can attract students, provide interactive and competitive game-based learning experiences, create meaningful experiences, and Quizwhizzer games can be designed by adjusting student learning strategies. This is in line with the advantages of Quizwhizzer according to (Samuel 2010) in (Novaliendry, 2013), namely first, increasing learning motivation. Second, technology-based learning. Third, there are interesting features. Fourth, train students to solve problems with logic. As research has been conducted by (Rukmana, Hartono, & Endrawati, 2024) that the learning model assisted by Quizwhizzer can have a positive effect, based on the increase in the achievement of students' final post-test scores. In line with the study conducted by (Rahmawati, et al 2022) showed an increase in post-test scores in the experimental class by applying the SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by power point media to student learning outcomes. This means that the SAVI learning model (Somatic, Auditory, Visual, Intellectual) assisted by other media also has a positive impact.

SAVI (Somatic, Auditory, Visual, Intellectual) learning model assisted by Quizwhizzer educational game has an effect on improving students' mathematical creative thinking skills. Because students' mathematical creative thinking increases if in learning activities students are given a stimulus that can increase creative thinking. Mathematical creative thinking ability itself is the ability to utilize the thinking process in the field of mathematics that is able to provide new ideas that are unique and diverse (Hassoubah) in (Darwanto, 2019). Creative thinking has indicators that include fluency, flexibility and originality (Silver, 1997) cited in (Minarsih, Suastika, & Sesanti, 2020).

In this study, researchers provide open or non-routine problems so that students are able to work on nonroutine problems that can train to improve their creative thinking skills. Researchers provide assistance in the form of Quizwhizzer educational games to train students in solving problems through logic (Kumala, et al., 2024). Providing stimulus can also be done by linking the application of varied and innovative learning designs such as the SAVI (Somatic, Auditory, Visual, Intellectual) learning model that can improve students' mathematical creative thinking skills. In the end, students are able to think fluently such as being able to create new ideas and solutions when solving math problems in a short time. Students are able to think flexibility by utilizing the ability to think to see problems from different perspectives and be able to produce alternative solutions to various mathematical problems. Then students are also able to think original by showing higher creative thinking skills such as being able to create solutions that are unusual or different from other friends.

IV. CONCLUSION AND SUGGESTIONS

SAVI *(Somatic, Auditory, Visual, Intellectual)* learning model assisted by Quizwhizzer educational game is proven to have a positive influence on students. By applying the SAVI *(Somatic, Auditory, Visual, Intellectual)* learning model with the help of *Quizwhizzer* educational games in the learning process, students are accustomed to solving problems by providing unusual solutions, learning experiences are more meaningful because students build their own knowledge, facilitate students' learning styles, learning is more interesting and meaningful. The results of these findings, it can be concluded that the SAVI *(Somatic, Auditory, Visual, Intellectual)* learning model assisted by the *Quizwhizzer* educational game is able to influence students' mathematical creative thinking skills. So that the SAVI *(Somatic, Auditory, Visual, Intellectual)* learning model assisted by *Quizwhizzer* educational games becomes a guideline in the implementation of an innovative learning process in order to be able to assist in optimizing and improving students' mathematical creative thinking fluency.

The results of the discussion above, as a form of effort to improve the learning process, therefore the researcher's suggestions are as follows: a) the results of the research that has been carried out by researchers as material for consideration for training for educators to optimize teaching competencies, especially in technological capabilities; b) the results of the study can be an alternative preference for determining learning models that are relevant to the use of technology-based educational games that are useful as meeting student learning needs; and c) the results of this study can be replicated by exploring other tools and can be used as a comparison.

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