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The Effect of ICM Active Learning Strategies on Students' Mathematics Learning Outcomes in JHS 2 Bangkinang

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ABSTRACT

The research background is that the learning process is less effective in order to achieve optimal student mathematics learning outcomes due to monotonous learning. This research is an experimental research aimed at knowing the results of students' mathematics learning with Index Card Match (ICM) with conventional students' mathematics learning outcomes. The research population was class VII students of JHS 2 Bangkinang consisting of 2 classes. The research sample was taken by purposive sampling, namely class VII students of JHS 2 Bangkinang totaling 58 people. This type of research is experimental research and the research design is a *Pre-test-Post-test* control group design. The data was collected using *Pre-test* and *Post-test* (*Pre-test-Post-test*) to measure students' mathematics learning outcomes. The analysis technique is descriptive and inferential statistical analysis technique. The results of the acquisition of descriptive statistics are *Pre-test* and *Post-test*. The average score of conventional learning students' mathematics learning outcomes is 41.52. The average score of learning outcomes for students learning to apply theICM is 70.17. The results were confirmed by the independent *t-test*, obtained a Pvalue of 0.000 which was smaller than the significant level of 0.05, so the hypothesis was accepted. It was concluded that the results of learning mathematics with the ICM strategy were higher than conventional learning. The effect of applying the ICM strategy to the mathematics learning outcomes of class VII students of JHS 2 Bangkinang.

Keywords: Mathematics Learning, ICM, Mathematics Learning Outcomes

INTRODUCTION

Education is an important tool in one's life to develop potential, skills and personality. Education is the most important means of developing human resources, attention must be paid to strengthening the educational components of the three educational environments (Sukarni & Prihatni, 2018). Education of a nation can be measured whether the nation is advanced or backward (Setiadi, 2018). The purpose of education is to improve the quality of life of individuals as human resources. Education can be held within the family, community and school environment (Supriyantoro, 2017). National education goals can be achieved if an appropriate curriculum or established rules are used as a reference in student learning (Ellya *et al*., 2021). Quality education can develop potential, increase capacity and skills to face life in the future (Syarifuddin, 2020).

Mathematics is recognized as important in human life. Mathematics is a scientific field that is closely related to the progress of science and technology (Tanjung & Nababan, 2016). Mathematics as one of the real subjects in the field of natural science is a subject that is often feared and disliked by students, because learning mathematics is mostly abstract in nature and is learned through the conversational method making it difficult to understand academic concepts. This is certainly one of the factors that hinders student learning (Romdoni & Supriyoko, 2017). Mathematics is a universal science that underlies the development of modern technology (Deswita & Eka Afri, 2018). Mathematics has an important role in various disciplines and shows the power of human thought (Sandri, 2018). Mathematics can support smooth learning, apart from choosing the right method, it is also necessary to use learning media which play a very important role in orienting student abstractions (Sumiati *et al*., 2020). Mathematics also prepares students for the ability to use mathematics and mathematical thinking models in everyday life to study various sciences (Wahyuni *et al*., 2022).

Learning mathematics is not just providing knowledge, but students must become subjects in the learning process (Zulfah & Astuti, 2018). Mathematics learning is said to be successful if the teacher himself knows the characteristics of mathematics (Yadrika, 2019). In studying mathematics there must be a relationship between one concept and another, and mastery of the concept is a prerequisite for other concepts. (Annisa & Marlina, 2019).

Learning outcomes are benchmarks used to determine student success in knowing and understanding a subject. Learning outcomes are the result of learning or teaching interactions (Hermawati, 2018). Learning outcomes can be in the form of students' skills, values, and attitudes after experiencing learning (Lasiyanto, 2018). Learning success is the achievement of learning objectives from the material studied during the learning process (Joeniarni & Mulyoto, 2022). The success of implementing learning strategies depends on the teacher's competence in packaging lessons (Pramudya *et al*., 2021). Learning objectives are learning outcomes that are defined both in terms of content and aspects of behavior (Huda *et al*., 2017). The goals of learning mathematics were stated in the 2001 Permendiknas namely reasoning, mathematical manipulation both in simplification and analysis of the components in problem solving. (Miliyawati, 2017). Carrying out and succeeding learning activities first requires encouragement or motivation to carry out these activities, because motivation causes a change in energy within a person, so that one begins to understand the problem of psychiatric symptoms and emotions as well as feelings of action or doing something. All of this is because of a purpose, need or desire (Putra, 2019). Based on the Regulation of the Minister of Education of the Republic of Indonesia Number 58 of 2001, it is clear that the goal of mathematics is to enable students to solve mathematical problems (Sumiati *et al*., 2020).

The cooperative learning model is a student-centered learning model that can overcome teacher problems by increasing student activity. Cooperative learning can increase student independence, mathematics achievement, student achievement, and students' understanding of mathematical concepts (Rahim *et al*., 2022). This study uses the correspondence learning model. This learning model can create a fun learning process to eliminate boredom in students (Hartiningrum & Ula, 2019). ICM involves finding a pair of students who are attractive enough to use to repeat a particular lesson. The goal is fun in this model, because the learning process of students looking for partners does not just sit around during the learning process. The advantages of the ICM type collaboration are that it promotes fun in the learning process, can create a positive atmosphere, makes it easier for students to understand subject concepts and creates collaboration between pairs. Learning using the ICM type of collaboration can improve learning outcomes (Hartiningrum & Ula, 2019).

The ICM learning strategy is expected that students can be more interested in the process of learning mathematics so that students learn more focused and achieve high learning outcomes (Sirait & Apriyani, 2020). This learning strategy requires students to have the knowledge to understand the material. The ICM learning strategy also provides opportunities for students to work together with their partners. Pairs are chosen randomly or by choosing a matching card from the same card number. Each student is responsible for finding out the steps for completing the questions on the card they receive and matching the final answer with the answer sheet (Yusuf Sukman, 2018). Based on the results of observations at JHS 2 Bangkinang for class VII in the learning process in class with one of the mathematics teachers said that the learning outcomes obtained by students were still low, especially in the cognitive (knowledge) section. The problem that occurs in class VII students of JHS 2 Bangkinang is that students are less active in the learning process, especially learning mathematics. The reason is because the learning process tends to be monotonous so that the learning process seems boring and this causes a decrease in student learning outcomes in class VII JHS 2 Bangkinang.

Referring to these problems, teachers need to improve learning outcomes. How to overcome this problem requires the participation of all parties involved in the educational environment, namely educators and students. In the implementation of learning, the teacher must have a strategy so that students can learn actively, effectively and efficiently so that the expected learning objectives can be achieved. One of the active learning strategies is ICM. The ICM strategy is a fun, interesting, democratic, and challenging strategy because it fits the characteristics of students and can increase physical activity, mental activity, and emotional activity of students. This is in accordance with relevant research conducted by (Lusia & Muncarno, 2020) concerning the Application of the ICM strategy to increase mathematics learning activity and outcomes. From the results of this study it was found that there was an increase in the activity and learning outcomes of students. This study concluded that with the ICM, the activities and learning outcomes of students could increase. This is in accordance with relevant research conducted by (Yasser, 2018) concerning the effect of applying icm type active learning strategies on understanding of mathematical concepts in class VII students. From the results of this study it was found that there was an increase in students' understanding of mathematical concepts by implementing active learning strategies of the ICM type. Based on the problems above, to see the effect of learning strategies on student learning outcomes at JHS 2 Bangkinang. Researchers want to conduct research with the title "The effect of ICM active learning strategies on students' mathematics learning outcomes at JHS 2 Bangkinang".

MATERIALS AND METHODS

The type of research used in this research is quasi-experimental research. The research design used was nonequivalent control group design. This study involved two classes, namely the experimental class and the control class, where these two classes were given different treatment. The experimental class was taught using the ICM learning strategy, while the control class was taught using the expository learning strategy.

This research was conducted at JHS 2 Bangkinang, which is located at Jl. Lieutenant Boyak No.11, Bangkinang City, Riau. This research was conducted in the odd semester of the 2022/2023 academic year in September until completion. The population in this study were 205 class VII students of JHS 2 Bangkinang for the 2022/2023 academic year. The sample in this study were 58 class VII students of JHS 2 Bangkinang for the 2022/2023 academic year. The sampling technique in this study used a purposive sampling technique, which is a sampling technique from members of the population (Campbell *et al*., 2020). Test techniques are used to collect data in the form of student learning outcomes in the cognitive domain. At the same time, a questionnaire was used to collect data on the effect of implementing an active strategy of the ICM type. The research instrument used in this study was in the form of a test instrument to see the results of learning mathematics more than KKM or experiencing improvements and differences in learning outcomes from before. The data collected is written test results in the form of essay questions. Written tests were carried out before and after the ICM learning method was applied to mathematics learning.

Data analysis techniques in quantitative research are using statistical analysis. There are two kinds of statistical analysis used in data analysis in research, namely descriptive statistical analysis and inferential statistical analysis. Descriptive statistical analysis is used to describe student learning outcomes towards learning mathematics obtained in the experimental group and the control group. Inferential statistical analysis consists of a normality test to find out whether the distribution of sample data to be analyzed is normally distributed or not using the *Kolmogorov-Simrnov test* in SPSS 25 software, homogeneity test to find out whether the data obtained has the same variance or vice versa using the *Levene test* on SPSS 25 software, and the hypothesis test performed was the *t-test* (Independent Sample *T-test*) with a significance level of 0.05 (5%) on SPSS 25 software.

RESULT

The control class applies conventional learning methods while the experimental class applies the ICM active learning strategy. The material taught in both classes is algebraic forms. The sample used consisted of 58 students. The control class consisted of 29 students and the experimental class consisted of 29 students. The learning process in each class was carried out in 8 meetings. The data obtained was in the form of giving a treatment (*Pre-test*) and after being given a treatment (*Post-test*) in the control class and the experimental class. Data collection was obtained from the answers to the two tests that had been given which consisted of 6 questions. Based on the results of the research that has been done, the acquisition of *Pre-test* scores shows that there is no significant difference between the control class and the experimental class. The results of the calculation of the *Pre-test* data in the control class and the experimental class were calculated using the SPSS 25 program. These results can be seen in Table 1 below.

Table 1. Data of control class and experiment class *pre-test* values

Data	***Pre-test***	
	Control Class	**Experiment Class**
Mean	37,10	41,52
Range	37	41
Minimum	25	25
Maximum	62	64
Standard Deviation	8,239	10,301
Varians	67,882	106,116

Based on Table 1 it can be seen that the mathematics learning outcomes at the *Pre-test* in the control class found an average in the control class of 37.10 while in the experimental class it was found an average of 41.52. The thing that causes the *Pre-test* score to be lower than the *Post-test* is because at the *Post-test* stage it is treated with an active learning strategy ICM while the *Pre-test* is not given treatment. The *Post-test* scores show that there are *Post-test* data calculation results in the control class and the experimental class are calculated using the SPSS 25 program. These results can be seen in the significant difference between the control class and the experimental class in Table 2 below.

Table 2. Pos*t-test* value data for control class and experimental class

Data	***Post-test***	
	Control Class	**Experiment Class**
Mean	58,76	70,17
Range	60	72
Minimum	38	45
Maximum	81	100
Standard Deviation	11,535	11,899
Varians	133,047	141,576

Based on Table 4.2 it can be seen that the results of learning mathematics in the *Post-test* in the control class found an average of 58.76 in the control class while in the experimental class it was found an average of 70.17. After the *Pre-test* and *Post-test* values are obtained, the values are processed by conducting analytical tests using the SPSS 25 program. The analytical tests carried out are the normality test, homogeneity test, hypothesis testing (independent sample *t-test*). The data analyzed in this normality test are the *Pre-test* and *Post-test* value data of the control class and the experimental class. The normality test uses the Kolmogorov - Smirnov test.The following is the data from the *Pre-test* normality test results in the control class and the experimental class in Table 3 below.

Table 3. Control class and experiment class normality test results

Class	**Sig. Value**	**Information**
Control Class	0,200	Data is normally distributed
Experiment Class	0,200	Data is normally distributed

Based on Table 4 above, it can be seen that the normality test results for the *Pre-test* data in the control class obtained sig = 0.200 > 0.05, while in the experimental class it was obtained sig = 0.200 > 0.05. The data obtained is normally distributed. So it can be concluded that the data from the *Pre-test* results in the control class and the experimental class are normally distributed. The data from the *Post-test* normality test results in the control class and the experimental class are in Table 4 below.

Table 4. Control class and experiment class normality test results

Class	**Sig. Value**	**Information**
Control Class	0,097	Data is normally distributed
Experiment Class	0,200	Data is normally distributed

Based on Table 4 above it can be seen that the *Post-test* data normality test results in the control class obtained sig = 0.200 > 0.05, while in the experimental class obtained sig =

0.097 > 0.05. The data obtained is normally distributed. So it can be concluded that the *Post-test* data results in the control class and the experimental class are normally distributed. The homogeneity test was carried out to find out whether the data from each class had the same variance (homogeneous) or not the same (non-homogeneous) before receiving different treatments. This analysis uses the SPSS 25 program, namely Levene's test. If the results of the homogeneity test show that the significance level is > 0.05, it can be stated that the variance of the sample concerned is not much different, then the sample is declared homogeneous. The hypothesis used is as follows.

- H_0 = Data is not homogeneous if Sig (2-tailed) < 0.05
- Hα = Homogeneous data if Sig (2-tailed) < 0.05

The following are the results of the *Pre-test-test* in the control class and the experimental class in Table 5 below.

Table 5. *Pre-test* homogeneity test results for control class and experiment class

Class	Sig. Value	Information
Control Class and Experiment Class	0.155	Homogeneous data

Based on Table 5 above, it can be seen that the data from the *Pre-test* homogeneity test results in the control class and the experimental class with a significance of 0.155 > 0.05. So it can be concluded that the data from the *Pre-test* results in the control class and the experimental class have the same variance or the data is homogeneous. The data from the *Post-test-test* results in the control class and the experimental class are in Table 6 below.

Table 6. *Post-test* homogeneity test results for control class and experiment class

Class	Sig. Value	Information
Control Class and Experiment Class	0.831	Homogeneous data

Based on Table 6 above, it can be seen that the *Post-test* homogeneity test data in the control class and experimental class with a significance of 0.831 > 0.05. So it can be concluded that the *Post-test* result data in the control class and the experimental class have the same variance or the data is homogeneous. Based on the results of the *Pre-test* data analysis prerequisite test, it was found that the control class and the experimental class were normally distributed and homogeneous. If the data is stated to be normally distributed and homogeneous, then the next step is to test the hypothesis. The independent *t-test* is used to compare the *Pre-test* and *Post-test* in certain classes. The hypothesis used with a significance level of 0.05 is as follows:

- H_0 : $\mu_1 = \mu_2$ there is no difference in average mathematics learning outcomes between students who receive conventional learning models compared to students who receive the application of the ICM strategy.
- H_α : $\mu_1 = \mu_2$ there is a difference in the average learning outcomes of mathematics between students who received conventional learning models compared to students who received the application of the ICM strategy.

Information:

- μ_1 = average mathematics learning outcomes of students who get the model conventional learning.
- μ_2= average mathematics learning outcomes of students who obtain implementation of ICM strategy.

The decision-making criteria for the test are as follows:

- If the value of Sig (2-tailed) < 0.05 then H_0 is rejected and H_α is accepted
- If the value of Sig (2-tailed) > 0.05 then H_α is rejected and H_0 is accepted

The results of the *Pre-test* data acquisition from the control class and experimental class can be seen in the complete data in the appendix which is written in Table 7 below.

Table 7. Independent *t-test Pre-test* results

Class	**Sig. Value**	**Information**
Control Class and Experiment Class	0,077	There is no significant difference

Based on Table 7 it can be seen that the sig value (2-tailed) > 0.05 is 0.77. Based on the research hypothesis where if the sig value (2-tailed) > 0.05 then Hα is rejected and H_0 is accepted. This means that at a significance level of 0.05 it can be concluded that there is no difference in the average learning outcomes of mathematics between students who receive conventional learning models compared to students who obtain the application of the ICM strategy. While the results of the *Pre-test* data acquisition from the control class and the experimental class can be seen in the complete data in the appendix written in Table 8 below.

Table 8. Independent *t-test Post-test* results

Class	**Sig. Value**	**Information**
Control Class and Experiment Class	0,000	There is no significant difference

Based on Table 8 above, it can be seen that sig (2-tailed) milai<0.05, which is 0.000. Based on the research hypothesis where if the sig value (2-tailed) <0.05 then H_0 is rejected and Hα is accepted. This means that at a significance level of 0.05 it can be concluded that there is an average difference in mathematics learning outcomes between students who receive conventional learning models compared to students who obtain the application of the ICM strategy. The research data was obtained from the results of the students' *Pre-test* and *Post-test*. Students in the control class have a lower level of learning outcomes compared to the experimental class. This statement is evidenced by the average score of mathematics learning outcomes in the control class of 37.10 while in the experimental class of 41.52. The results obtained indicated that the results of learning mathematics in the experimental class were higher than the control class. Therefore, to improve the results of learning mathematics, a treatment is given in the form of applying the ICM strategy.

After being given a treatment in the form of a conventional learning model in the control class and ICM in the experimental class, students' mathematics learning outcomes increased. This is evidenced by the results of the average score of mathematics learning outcomes in the control class 58.76, while the experimental class 70.17. From the acquisition of *Pre-test* and *Post-test* scores, both in the control class and in the experimental class, mathematics learning outcomes have increased. This is in line with relevant research conducted by (Lusia & Muncarno, 2020) concerning the Application of the ICM Strategy to Increase Mathematics Learning Activity and Outcomes. From the results of this study it was found that there was an increase in the activity and learning outcomes of students. This study concluded that with the ICM strategy, the activities and learning outcomes of students could increase. This is in accordance with relevant research conducted by (Yasser, 2018) concerning the Effect of Applying ICM Type Active Learning Strategies on Understanding of Mathematical Concepts in Class VII Students of JHS 17 Padang. From the results of this study it was found that there was an increase in students' understanding of mathematical concepts by implementing active learning strategies of the ICM type. Based on the research that the researchers have done and the various studies that have been done before, it can be concluded that the ICM active learning strategy has an influence on students' mathematics learning outcomes. In this study, the ICM active learning strategy had an influence on improving the mathematics learning outcomes of class VII students of JHS 2 Bangkinang on algebraic material.

CONCLUSION

Based on the results of the research and discussion above, it can be concluded that the use of the ICM active learning strategy has a significant effect on the mathematics learning outcomes of class VII students of JHS 2 Bangkinang. This is evidenced by the independen*t-test*, which has a sig value of 0.000 <0.05. There is an effect of applying active learning strategies ICM students who have high, medium, and low on mathematics learning outcomes. The results of learning mathematics using the application of active learning strategies ICM are better than the results of learning mathematics without treatment. There is an influence between the ICM learning strategy on students' mathematics learning outcomes. The application of the ICM learning strategy can be carried out using more interesting and innovative media. In ICM learning it is more effective in classes with an even number of students, so that the implementation of the strategy is easier to implement.

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REFERENCES

Annisa, F., & Marlina, M. (2019). Application of the ICM Cooperative Learning Model to the Activities and Results of Students' Mathematics Learning. Basicedu journal, 3(4), 1047–1054.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. Journal of Research in Nursing, 25(8), 652–661.

Deswita, H., & Eka Afri, L. (2018). The Influence of ICM Active Learning Strategies on Mathematics Learning Outcomes of Grade VIII Students of SMP Negeri 1 Fullness. ICM.

Ellya N, Daharnis, Yeni Erita, A. F. (2021). Pengaruh Strategi Pembelajaran Aktif Tipe ICM Terhadap Hasil Belajar Peserta Didik di Sekolah Dasar. *Jurnal Basicedu*, *5*(6), 6349_6356.

Hartiningrum, E. S. N., & Ula, N. S. (2019). The Effect of the ICM Cooperative Learning Model on Students' Mathematics Learning Outcomes. Al-Khwarizmi: Journal of Mathematics and Natural Science Education, 7(2), 79–86.

Hermawati, Y. (2018). Contribution of home study facilities, motivational learning and parental education to secondary school mathematics student learning outcomes. Wiyata Dharma: Journal of Educational Research and Evaluation, 6(2), 187.

Huda, S., Haryanto, S., & Chaerun, C. (2017). Implementasi model pembelajaran cooperative learning type jigsaw dalam rangka peningkatan motivasi dan prestasi pelajaran matematika pada siswa kelas VII MTsN Yogyakarta tahun pelajaran 2015/2016. *Wiyata Dharma: Jurnal Penelitian dan Evaluasi Pendidikan*, *5*(1), 49-55.

Joeniarni, L., & Mulyoto, M. (2022). Application of the Jigsaw Learning Model with Script Card Media to Increase Interest and Learning Outcomes of Javanese Script Writing Skills. Wiyata Dharma: Journal of Educational Research and Evaluation, 10(1), 72–80.

Lasiyanto, L. (2018). Application of assignment techniques with the think pair square method to increase students' interest and achievement in learning mathematics in learning mathematics Application of assignment techniques with think pair square method to increase interest and achievement. Journal of Educational Research and Evaluation, 6(1), 15–19.

Lusia, N., & Muncarno. (2020). Application of the ICM Strategy to Increase Mathematics Learning Activity and Outcomes.

Miliyawati, B. (2017). Strategy Reformulation of Mathematical Habits of Mind Against Mathematical Critical Thinking Ability in Realizing a Golden Generation with Character. JNPM (National Journal of Mathematics Education), 1(1), 24.

Pramudya, L. N., Nurtamam, M. E., & Siswoyo, A. A. (2021). The Influence of Game Methods Based on Diesnes Theory on Motivation and Learning Outcomes of Grade IV Students at SDN Grabagan Sidoarjo. UMM Education Seminar, 1–11.

Putra, S. P. (2019). The contribution of teachers' teaching abilities, learning discipline, and learning motivation to the mathematics learning achievements of vocational high school students. Wiyata Dharma: Journal of Educational Research and Evaluation, 7(1), 120–132.

Rahim, N., Bito, N., & Resmawan, R. (2022). The Use of Google Classroom-Assisted Edpuzzle on Mathematics Learning Achievement of Vocational High School Students. JNPM (National Journal of Mathematics Education), 6(3), 443–454.

Romdoni, M., & Supriyoko. (2017). Application of the PBL Model with Video to Increase

Interest and Achievement in Learning Mathematics for Class X MIPA 2 SMAN Minggir. Journal of Educational Research and Evaluation, 5(1), 63–69.

Sandri, M. (2018). The Influence of Song Media on Mathematics Learning Outcomes in Material Characteristics of Flat Shapes for Class 5 SD Negeri 5 Bengkulu City. JNPM (National Journal of Mathematics Education), 2(1), 1.

Setiadi, Y. (2018). The Relationship between Self-Concept, Emotional Intelligence, and Learning Anxiety with Student Learning Achievement. JNPM (National Journal of Mathematics Education), 2(1), 119.

Sirait, E. D., & Apriyani, D. D. (2020). The Effect of Using ICM Active Learning Strategies on Mathematics Learning Outcomes. JPMI (Journal of Indonesian Mathematics Education), 5(1), 46.

Sukarni, & Prihatni, Y. (2018). The contribution of learning disciplines, home learning facilities, and parental attention to natural science student achievement. Wiyata Dharma: Journal of Educational Research and Evaluation, 6(1), 92–101.

Sumiati, T., Hendawati, Y., Caturiasari, J., & Yulianingsih, M. (2020). The Application of Cooperative Learning Model Think Pair Share (TPS) Type to Improve The Ability of Understanding Science Concepts in Primary School. *International Conference on Elementary Education* (Vol. 2, No. 1, pp. 1177-1189).

Supriyantoro, J. (2017). Wiyata Dharma The Influence of Parents' Role, Student's Perception Of Teacher's Pedagogic Competency And Learning Discipline On Mathematics Learning Achievement Of Students In Stanawiyah Madrasah StudentS (MTs N) In Piyungan District, Bantul Regency Effect Of Role Of Parents, STU. IV.

Syarifuddin, A. (2020). The Influence of ICM Method on Mathematics Learning Outcomes In Class Viii Students Of SMP Muhammadiyah 1 Makassar. 2507(February), 1–9.

Tanjung, H. S., & Nababan, S. A. (2016). The effect of using the play learning method on the mathematics learning outcomes of students on the subject matter of fractions in class III SD Negeri 200407 Hutapadang. Journal of Bina Gogik, 3(1), 35–42.

Wahyuni, M., Dwiana, A. A., Samosir, A., Sari, N. T., Awalia, N., Budiyono, A., Studies, P., Basic, P., Heroes, U., & Tambusai, T. (2022). Elementary Education https://jbasic.org/index.php/basicdu. 6(1), 499–505.

Yadrika, G. (2019). Think-Talk-Write: Strategies to Improve Students' Mathematics Learning Outcomes. JNPM (National Journal of Mathematics Education), 3(2), 294.

Yang, X., & Kaiser, G. (2022). The Effect of Mathematics Teacher Professional Competence on Learning Quality and Student Mathematics Learning Outcomes Machine Translated by Google. Current Opinion in Behavioral Sciences, 48, 1–8.

Yasser. (2018). The Effect of Applying the ICM Type of Active Learning Strategy on the Understanding of Mathematical Concepts for Class VII Students of SMPN 17 Padang.

Yusuf Sukman, J. (2018). The Effect of Generative Learning Strategies (Vol. 4).

Zulfah, & Astuti, ulfa santy novri. (2018). The Influence of React Strategy (Relating, Experiencing, Applying, Cooperating, Transferring) Against the Ability of Understanding Mathematical Concepts of Class VII Students of Bangkinang 1 Public Middle School. Journal of Scholars: Journal of Mathematics Education, 2(2), 81–90.