

THE EFFECT OF THE QUIZIZZ-ASSISTED STUDENT TEAMS ACHIEVEMENT DIVISION (STAD) TYPE COOPERATIVE LEARNING MODEL ON STUDENTS' MATHEMATICAL PROBLEM SOLVING SKILLS AND LEARNING MOTIVATION

Nida'an Khofiyya¹, Jaka Wijaya Kusuma², Sarah Caesarani³

^{1,2,3}Mathematics Study Program, Faculty of Teacher Training and Education, Universitas Bina
Bangsa, Serang, Indonesia

Email: nidankhyia@gmail.com.

ABSTRACT

This research was motivated by the low problem-solving ability of students which had an impact on student motivation in learning mathematics. In solving mathematical problems, learning motivation is an essential element that students must have, students who have high learning motivation will be diligent in doing tasks, tenacious and never give up in solving various problems and obstacles. However, students' mathematical problem-solving abilities and student motivation in learning mathematics are still relatively low, one of which is due to the learning model used has not varied so that students are less actively involved in learning. The type of research used in this study is quasi-experimental quantitative research. The quasi-experimental form used is Pretest-posttest Control Group design Pretest-Posttest. The data collection technique used is a problem-solving ability test by presenting 5 questions in the form of essays and student learning motivation questionnaires by presenting 18 points of statements, each question has been validated. The data analysis used is quantitative descriptive analysis, normality test, homogeneity test, t-test and Likert scale test. Results were obtained (1) paired sample t-test in the experimental class and control class respectively obtained $\text{Sig} \geq \alpha = 0,05$ values so that H_0 was accepted and H_1 was rejected. (2) Independent sample t-test in experimental class and control class obtained $\text{Sig} \text{ value} < \alpha = 0,05$ so that H_0 was rejected and H_1 was accepted. Moreover, (3) the results of student motivation analysis were obtained on average by 81% with solid criteria. The conclusions of this study are: (1) There is no difference in students' initial mathematical problem solving ability before learning in experimental and control classes; (2) The mathematical problem-solving ability of students using the Quizizz-assisted STAD learning model is better than students using conventional learning models; (3) There is an influence on student learning motivation using the STAD type cooperative learning model which shows the percentage criteria of 81% of all 5 learning motivation indicators with the category "very strong" owned by students of SMPN 6 Cilegon City. So that the effect of the Student Teams Achievement Division (STAD) type cooperative learning model assisted by Quizizz on students' problem-solving abilities and learning motivation is quite effective compared to conventional learning models.

Keywords: STAD learning model, Mathematical problem solving ability, Student learning motivation

INTRODUCTION

Every child needs education as a provision to face increasingly fierce global competition. Education provides opportunities for children to compete and develop their potential. Mathematics learning has many roles in the educational setting both at the middle and upper levels in order to realize Indonesian people as a

whole, namely humans who are able to solve the problems they face. This is stated in one of the mathematics learning objectives based on the 2013 Curriculum, namely students are required to have problem-solving skills that require students to be active in following the learning process and strive for intellectual intelligence in

discovering new things, so that teachers act as teachers and facilitators.

Based on the learning objectives above, solving mathematical problems and developing student character is one of the essential goals that must be achieved in learning mathematics. This is reinforced by Branca's opinion in Hendriana & Soemarno (2014: 23) which states that the process of solving mathematical problems is at the heart of mathematics. The problem-solving process provides opportunities for students to play an active role in learning, searching, and finding their information/data to be processed into concepts, principles, theories, or conclusions (Hamalik, 2010).

Problem-solving ability is the ability of students to understand mathematical concepts, find solutions and apply them. With the ability to solve problems in students, it can make it easier for students to solve problems from easy and challenging levels. Problem solving can also be used as a benchmark for student success during the learning process.

A person's ability to solve mathematical problems requires several things including readiness, creativity, knowledge and the ability to apply them in everyday life. Students must possess the ability to solve mathematical problems because it can make it easier for students to solve problems and get solutions to the problems faced, both those originating from subjects and problems originating from everyday life. Students can be said to be able to solve problems if they are able to understand, find and find solutions then apply them in everyday life.

From the results and evaluation of PISA 2015 the ability of students in Indonesia is still relatively low, one of which for the field of mathematics is ranked 69 out of 76 countries evaluated, this shows that the ability to solve mathematical problems of students in Indonesia is still relatively low. This low ability will result in the low quality of human resources, which is shown in the low problem-solving ability, especially in mathematics learning. This is because

during learning teachers do not provide opportunities for students to develop their abilities in solving mathematical problems so that many students have difficulty solving mathematical problems, many students feel that mathematics is a complicated subject, many students are less actively involved in learning mathematics. Through problem solving, students can improve their thinking skills, apply procedures, deepen their conceptual understanding (Das, 2013).

There are many factors that cause low problem-solving skills in Indonesia, including low learning outcomes, decreased student learning motivation, teaching materials that do not support students to develop mathematical problem solving skills. This happens not only because the students do not like the lesson but, the strategies used still use conventional learning models.

One solution that can overcome this problem is by being able to activate students in learning, able to increase student interest in mathematics learning, provide motivation and attract student attention by providing many practice problems in the form of problem solving. So that learning can run well and maximum results. This kind of learning is one of them by using cooperative learning type *Student Teams Achievement Division* (STAD) which is assisted by the use of Quizizz.

Cooperative learning is a lesson that can make it easier for students that can encourage students to be more active. This learning also provides convenience for students because this learning forms a small group so that students can easily understand explanations with peers, especially in STAD type cooperative learning. The STAD-type cooperative learning model is one of the simplest cooperative learning models. STAD type cooperative learning has five main components, namely: a) class presentation, b) assigning students in groups, c) tests and quizzes, d) improvement scores, e) group rewards. The components in STAD type cooperative learning are able to

activate the learning process and get maximum results (DEWI et al., 2021).

In the learning process, motivation is one vital aspect. It often happens that students who lack achievement are not caused by their lack of ability, but because there is no motivation to learn so that they do not try to exert all their abilities. Thus, it can be said that low-achieving students are not necessarily due to their low abilities, but may be caused by the absence of drive or motivation. Motivation has a vital role in the teaching and learning process for both teachers and students. Motivation is seen as a mental drive that drives and directs human behavior, including learning behavior So that learning motivation is essential to achieve learning goals (La'ia & Harefa, 2021).

One of the learning methods that is predicted to increase student motivation is STAD assisted by quizizz. STAD type cooperative learning (*Student Teams Achievement Division*) is a learning method that will improve teamwork and also students' responsible attitude for what they learn through a fun and not scary way, namely in the form of quizzes. While quizizz is a narrative and flexible educational game application as a means to deliver exciting and fun material and evaluations (Salsabila et al., 2020).

The use of Quizizz learning media is one of the efforts to accommodate learning media problems in Indonesia that cannot be applied conventionally. To create a more lively learning atmosphere, the use of the Quizizz application can be an effort, without losing the essence of the material that the teacher has delivered. In line with opinion Salamah (2022). that a pleasant learning state for students can improve their problem-solving skills and learning motivation.

Based on the description above, the author is interested in conducting a research entitled "**The Effect of the Cooperative Learning Model of *Student Teams Achievement Division* (STAD) Type Assisted by Quizizz on Mathematical Problem Solving Ability and Student Learning**

Motivation". This study examines the effect of the STAD type cooperative learning model on students' mathematical problem solving ability and learning motivation.

RESEARCH METHODS

Based on the problem studied, the method used in this study uses quantitative quasi-experiments. The quasi-experimental form used is Pretest-posttest Control Group design. Quantitative research is experimentally planned, systematic, and tightly controlled, both in the form of functional design and factorial design. This is in accordance with what was conveyed by Sugiyono (2017: 24) that quantitative research methods are used when you want to know the effect of specific treatments on something.

This study is in accordance with the problem formulation, which aims to determine whether there is an influence of using the *Student Teams Achievement Division* (STAD) type cooperative learning model assisted by quizizz on mathematical problem solving ability and student learning motivation. In this study, there are two learning groups, namely class VIII, B and C, which will be seen as research subjects. Class VIII B as an experimental class that uses a cooperative learning model type *Students Teams Achievement Division* (STAD) and measures student motivation in learning mathematics and class VIII C as a control class that uses conventional learning. Both classes are given the same learning material.

The purpose of this research method is to provide an overview to researchers of how research is carried out, so that problems can be solved. Like research in general, data collection techniques in quantitative research are carried out with documentation studies followed by pretest-posttest tests and questionnaires. The research data was processed based on appropriate data analysis techniques, and in this study variables were measured through the process of dividing pretest and posttest tests, which then used

the SPSS Statistics Version 26 program by entering data on pretest and posttest test results and processed using statistical calculations and research questionnaires using the *Likert scale* in the form of a *checklist*. The independent variable in this study is the STAD type cooperative learning model or also called variable (X), and the dependent variable is the ability to solve mathematical problems and student learning motivation or also called the variable (Y).

RESULTS AND DISCUSSION

The data obtained from the study will be analyzed. The analysis carried out is test data analysis and questionnaire data analysis. Test data analysis is data derived from test instrument results, while questionnaire data analysis is data derived from non-test instrument results in the form of questionnaires. The data analysis procedure is as follows:

1. Test Data Analysis

a. Normality Test

The normality test is carried out to find out whether the research data is standard or not. The meaning of ordinary in this test is the distribution of the data produced evenly, so that the population used in the study comes from the same or average population. *Pretest and posttest data obtained from experimental and control classes were tested* using the Kolmogorov Smirnov test using SPSS software version 26. The data can be said to be normally distributed. If $GIS > \alpha$, where the value of $\alpha = 0.05$. The normality test results of *pretest* and *posttest* data are shown in the following table

Table 22 Pretest and Posttest Normality Test Results

Class	Kolmogorov-Smirnov Sig.
<i>Pre-Test</i> Experiment	.062
<i>Post-Test</i> Experiment	.200
<i>Pre-Test</i> Control	.200
<i>Post-Test</i> Control	.192

Table 22 shows that the significant values for experimental and control class *pretests* are 0.062 and 0.200 respectively where *the Sig.* > 0.05 . Similarly, the experimental and

control class *posttest Sig.* values were 0.200 and 0.192 respectively where the sig value > 0.05 . This shows that the research data is usually distributed.

b. Homogeneity Test

Based on normality testing, *the pretest* and *posttest* data obtained are normally distributed. The next step is to test the homogeneity of the experimental and control class *pretest* and *posttest* data aiming to determine whether the data have uniformity (variance) from groups taken from the same population. The homogeneity test used in this study was the Levene test with SPSS software version 26. If it meets the sig criteria $> \alpha$ (0.05). The results of the homogeneity test of *pretest* and *posttest* data are shown in the following table

Table 13 Homogeneity Test Results *Pre-Test* and *Post-Test*

Class	Sig. Based On Me	Information
Experiments and Controls	.567	Homogeneous

Based on table 23, it is known that the significance value (*Sig.*) *based on mean* is $0.567 > 0.05$. Because the significant value of the experimental and control class *pretest* and *posttest* data > 0.05 , it can be concluded that the variance of *pretest* and *posttest* data in experimental and control classes is homogeneous.

c. Test the hypothesis

After the normality test and homogeneity test, it is known that the research data used are normally distributed and have homogeneous variances. Because the data is usually distributed and has homogeneous variance, hypothesis testing is carried out using parametric statistics, namely paired sample t-test (t-test) and independent sample t-test (t-test) in SPSS software version 26.

1) Paired Sample t-Test Analysis Results

The *paired sample t-test* was carried out on the *pretest* data of the experimental class using the *STAD learning model* and the

control class using the conventional model. This test is used to determine the difference in students' initial mathematical problem-solving abilities before being treated with STAD learning models and conventional models. The following are the paired *sample t-test results* in table 24.

Table 24 Test Results of Sample t-Test

	Sig. (2-tailed)	Information
Pretest Experiments and Controls	.254	H0 accepted

Based on table 24 above, the *Sig. (2-tailed) value* is obtained at $0.254 \geq 0.05$ so that H0 is accepted and H1 is rejected. Because H0 is accepted and H1 is rejected, it can be concluded that there is no significant difference in *pretest* results in the experimental class and control class in students' mathematical problem solving abilities.

2) Analysis Results of Independent Sample t-Test

The *independent sample t-test* was conducted on *experimental class posttest data* using the STAD learning model and *control class posttest data* using conventional learning models. This test was used to determine the difference between the average score of students' mathematical problem-solving ability in the experimental and control classes after being treated.

Table 25 Test Results of Independent Sample t-Test

Class	Sig. (2-tailed)	Information
Control Experiments	.000	H0 rejected

Based on table 25 above, the *value of Sig. (2-tailed)* is obtained at $0.000 < 0.05$ so that H0 is rejected and H1 is accepted. Because H0 is rejected and H1 is accepted, it can be concluded that there is a significant difference in *posttest* results between the experimental class and the control class in students' mathematical problem-solving abilities. So it can be concluded that the STAD learning model has a significant effect on students' mathematical problem

solving ability compared to conventional learning models. So it can be concluded that the mathematical problem solving ability of students who use the STAD learning model assisted by Quizizz is better than the conventional learning model.

2. Questionnaire Data Analysis

Questionnaire data analysis aims to determine student learning motivation during the learning process using the STAD learning model assisted by Quizizz. Test calculation Questionnaire analysis uses *Microsoft excel software* to calculate Likert scale test. With the following acquisition data:

It can be seen that the percentage results on each indicator of learning motivation conducted in the experimental class as many as 33 respondents.

Table 27 Learning Motivation Indicator Results

No	Learning Motivation Indicators	Max Score	Average	Experimental Class Percentage	Criterion
1	Passion and Desire to succeed	680	3,80	82%	Very Powerful
2	Encouragement of Needs in learning Mathematics	396	4,33	90%	Very Powerful
3	Hopes and aspirations for the future	396	3,59	67%	Strong
4	Awards in learning	264	2,70	86%	Very Powerful
5	Interesting activities in learning Mathematics	660	4,72	83%	Very Powerful
Average Percentage				81%	Very Powerful

Based on the results in table 27 shows that indicators 1, 2, 4, and 5 have decisive criteria, while indicator 3 has vital criteria. The most significant percentage of indicators of the drive of needs in learning mathematics is 90%. While the smallest percentage of indicators of hopes and aspirations in the future is 67%. Moreover, based on the criteria of the average score of each indicator of learning motivation in table 14, the 1st and 3rd indicators were obtained that the average scores were 3.80 and 3.59 with good criteria for the statement. Then the 2nd and 5th indicators were obtained that the average values were 4.33 and 4.72 with excellent criteria for the statement. While the 4th indicator obtained that the average value was 2.70 with unfavorable criteria for the statement.

Discussion

This study aims to determine the use of the *Student Teams Achievement Division (STAD)* learning model assisted by Quizizz on students' mathematical problem solving abilities and student learning motivation carried out in grade VIII SMP Negeri 6 Cilegon City. In the experimental class, the *Student Teams Achievement Division learning model* assisted by Quizizz was applied, while in the control class, conventional learning was applied. The learning material taught in the experimental class and the control class during the study was number patterns.

1. Students' Initial Mathematical Problem Solving Skills

Before doing learning using the model to be applied. So an initial test was carried out aimed at seeing if there was a difference in the initial ability of the experimental class and the control class. This can be seen from the initial test assessment or *pretest* of students' mathematical problem-solving abilities. Based on table 24, the initial ability results obtained show that there is no difference in the initial mathematical ability of experimental and control class students. This is because both classes have not been given a learning model to improve students' mathematical problem solving skills. So that students have not been able to solve problems in accordance with the indicators of problem-solving ability.

As for the answer sheets of experimental class students and control classes, students have not been able to solve problems in accordance with the stages of student problem-solving abilities, namely understanding problems, planning problem strategies, implementing problems according to plan and re-examining results and answers. At this early stage, students only write answers without formulas and conclusions so that the initial abilities of the experimental class and the control class are still the same. Based on this analysis, it can be

concluded that there is no difference in the initial ability of the experimental class and the control class because the learning model used is still the same, namely using conventional learning models.

This is in line with Tanjung (2021) which revealed that "the initial mathematical ability test was used to determine the average equivalence of experimental and control groups. So there is no difference in the average initial ability. Thus, the experimental group and the control group have the same initial capabilities."

2. Student Problem Solving Ability with STAD and Conventional Type Cooperative Learning Models

Based on the results of data management in table 25, it was concluded that there were differences in students' mathematical problem solving abilities after being given learning treatment in the experimental class and the control class. In the control class using conventional learning models, there are differences in problem-solving abilities before and after learning. Likewise, in experimental classes using the *Student Teams Achievement Division learning model* assisted by Quizizz, students experienced differences in students' mathematical problem-solving abilities before and after learning.

As for the final ability of solving mathematical problems, students in the experimental class and the control class have differences. In the experimental class, the average score was more significant than the average score of the control class. So that the *Student Teams Achievement Division learning model* assisted by Quizizz is better than the conventional learning model for students' mathematical problem solving abilities.

3. The Effect of the STAD Type Cooperative Learning Model on Student Learning Motivation

The process of implementing cooperative learning type *Student Teams Achievement Division (STAD)* refers to learning steps that emphasize team achievement obtained from the sum of all individual progress scores of

each team member STAD type cooperative learning has five main components, namely: a) class presentation, b) assigning students in groups, c) tests and quizzes, d) improvement scores, e) group awards. The test used during learning is in the form of LKPD so that the learning objectives run according to the objectives. The provision of LKPD provides an opportunity for students to discuss groups so that they can complete the tests given. Then individual quizzes are given in the form of multiple choice or essays that are applied in Quizizz. To create a more lively learning atmosphere, the use of the Quizizz application can be an effort, without losing the essence of the material that the teacher has delivered.

Based on this, the use of the STAD learning model assisted by Quizizz can motivate students to learn with exciting and meaningful experiences for students in facing existing problems by investigating and analyzing as solutions to daily problems.

In addition, the questionnaire test using the *Likert* scale showed a percentage value of 81% with decisive criteria. From the results of the percentage value, it shows that there is a powerful learning motivation in experimental class students with the *STAD learning model* which states that students of SMPN 6 Cilegon City intensely own the five aspects of learning motivation.

Based on the discussion above, it can be concluded that the *Student Teams Achievement Division (STAD)* type cooperative learning model assisted by Quizizz affects the ability to solve mathematical problems and student learning motivation.

CONCLUSION

Based on the results of the research that has been obtained, as well as the problems that have been formulated, researchers make the following conclusions:

1. There was no difference in students' initial mathematical problem-solving skills before learning in the experimental class and the control class

2. There are differences in the mathematical problem-solving ability of students who use the Quizizz-assisted STAD learning model better than students who use conventional learning models.

3. The influence of learning motivation on students who use the STAD learning model assisted by Quizizz.

REFERENCES

- Amin, M. (2023). Jurnal Pendidikan dan Konseling Model Pembelajaran Cooperative Learning. 5, 200–213.
- DEWI, N. A., IRHAM, M., & WIBOWO, S. E. (2021). Pengaruh Penerapan Pembelajaran Kooperatif Tipe Stad Terhadap Kemampuan Pemecahan Masalah Matematika. *Ganec Swara*, 15(1), 874. <https://doi.org/10.35327/gara.v15i1.186>
- Hamalik, O. (2010). Kurikulum dan Pembelajaran. Jakarta: Bumi Aksara.
- Hasibuan, I. S., Br.Sinaga, R. S., & Sitepu, D. R. B. (2021). ANALISIS PEMBELAJARAN DARING TERHADAP MOTIVASI BELAJAR MATEMATIKA SISWA KELAS X SMA SWASTA TAMAN SISWA PADANG TUALANG. *Jurnal Serunai Matematika*, 13(1), 89–98.
- Hendriana, H., & Sumarmo, U. (2014). Penilaian Pembelajaran Matematika. Bandung: Refika Aditama.
- Irwan Setiawan, M. A. H. A. (2014). Profil Kondisi Fisik Atlet Tarung Derajat Pusat Pelatihan Kota Kediri Dalam Menghadapi Kejuaraan Provinsi Jawa Timur Tahun 2017, 2(3), 89–97.
- Jakni. (2016). Metodologi penelitian Eksperimen.
- Kuntjojo, Model-Model Pembelajaran. (Kediri: Universitas Nusantara PGRI, 2010), hal. 14
- Kusuma, J. W., & Hamidah, H. (2019). Pengaruh Model Pembelajaran ARIAS dan Cooperative Script DOI: <https://doi.org/10.31004/basicedu.v6i6.3705>

- terhadap Minat dan Hasil Belajar Matematika. *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, 2(1).
- La'ia, H. T., & Harefa, D. (2021). Hubungan Kemampuan Pemecahan Masalah Matematis dengan Kemampuan Komunikasi Matematik Siswa. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, 7(2), 463. <https://doi.org/10.37905/aksara.7.2.463-474.2021>
- lamsari purba, leony sanga. (2019). Peningkatan konsentrasi Belajar Mahasiswa Melalui Pemanfaatan Evaluasi Pembelajaran Quizizz Pada Mata Kuliah Kimia Fisika I. *Jurnal Dinamika Pendidikan*, 12(1), 29–39.
- Novitasari, D. (2019). Analisis Kemampuan Pemecahan Masalah Matematika siswa kelas IX SMP dengan Menggunakan Soal Programme For International Student Assesment (PISA) Pada Konten Ruang dan Bentuk. (Doctoral dissertation, UIN Raden Intan Lampung).
- Prof. Dr. Sumarno U., Dr. Hj. Rohaeti E., E., Dr. H. Heris H., (2017) *Hard Skills dan Soft Skills*. Jakarta. Refika Aditama.
- Purwanto, J., Rahma, I. N., Gunawan, G., & Kusuma, J. W. (2022). The effect of mathematics problem-solving ability and learning independence on mathematics learning achievement in online learning. *International Journal of Economy, Education and Entrepreneurship*, 2(2), 309-316.
- Rasmitadila, Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., & Tambunan, A. R. S. (2020). The perceptions of primary school teachers of online learning during the covid-19 pandemic period: A case study in Indonesia. *Journal of Ethnic and Cultural Studies*, 7(2), 90–109. <https://doi.org/10.29333/ejecs/388>
- Rohman, B., Aziz, J. A., Imran, A., & Jarudin, J. (2020). Distance Instructional Strategies and Learning Motivation towards Learning Outcome of the Study Al-Qur'an in Situation a COVID-19 Pandemic. *Universal Journal of Educational Research*, 8(12), 6609–6619. <https://doi.org/10.13189/ujer.2020.081225>
- Salamah, D. (2022). Pembelajaran Team Quiz Berbantuan Quizizz Terhadap Motivasi dan Hasil Belajar Siswa. 2(November), 461–470.
- Salsabila, U. H., Habiba, I. S., Amanah, I. L., Istiqomah, N. A., & Difany, S. (2020). Pemanfaatan Aplikasi Quizizz Sebagai Media Pembelajaran Ditengah Pandemi Pada Siswa SMA. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi|JIITUJ|*, 4(2), 163–173. <https://doi.org/10.22437/jiituj.v4i2.11605>
- Sembiring, E. A. (2019). Pengaruh metode pencatatan persediaan dengan sistem periodik dan perpetual berbasis SIA terhadap stock opname pada perusahaan dagang di PT Jasum Jaya. *Accumulated Journal (Accounting and Management Research Edition)*, 1(1), 69–77. Diambil dari <http://e-journal.potensi-utama.ac.id/ojs/index.php/Accumulated/article/view/584>
- Septian, A., Agustina, D., & Maghfirah, D. (2020). Model Pembelajaran Kooperatif Tipe Student Teams Achievement Division (STAD) untuk Meningkatkan Pemahaman Konsep Matematika. *Mathema: Jurnal Pendidikan Matematika*, 2(2), 10. <https://doi.org/10.33365/jm.v2i2.652>
- Solikah, H. (2020). Pengaruh Penggunaan Media Pembelajaran Interaktif Quizizz terhadap Motivasi dan Hasil Belajar Siswa pada Materi Teks Persuasif Kelas VIII di SMPN 5 Sidoarjo Tahun Pelajaran 2019 / 2020. *Bapala: Jurnal Mahasiswa UNESA*, 7(3), 1–8. <https://jurnalmahasiswa.unesa.ac.id/index.php/bapala/article/view/34508>
- SYAMSIYAH, F. (2018). PERBEDAAN HASIL BELAJAR MATEMATIKA SISWA MENGGUNAKAN MODEL

- PEMBELAJARAN AUDITORY, INTELLECTUALLY, REPETITION (AIR) DENGAN STUDENT FACILITATOR AND EXPLAINING (SFAE) SISWA KELAS XI SMA NEGERI 1 CAMPURDARAT TULUNGAGUNG TAHUN AJARAN 2017/2018. In INSTITUT AGAMA ISLAM NEGERI (IAIN) TULUNGAGUNG (hal. 1–69).
- Tanjung, K. (2021). Pengaruh Model Pembelajaran Problem Based Learning Terhadap Kemampuan Pemecahan Masalah Pada Pokok Bahasan Balok di Kelas VIII SMP N 2 Sampean Sungai Kanan.
- Ulfa, R. (2021). Variabel Penelitian Dalam Penelitian Pendidikan. *Jurnal pendidikan dan keislaman*, 342–351. <https://doi.org/10.32550/teknodik.v0i0.554>
- Umiyati, H. (2021). Populasi Dan Teknik Sampel. makalah, 1–25. Diambil dari https://www.researchgate.net/profile/Hisam-Ahyani/2/publication/352642302_Populasi_Dan_Teknik_Sampel_Fenomena_Pernikahan_dibawah_Umur_Masyarakat_50_d_i_KotaKabupaten_X/links/60d19d7492851ca3acbb406e/Populasi-Dan-Teknik-Sampel-Fenomena-Pernikahan-dibawah-USWm
- Widana, W., & Muliani, P. L. (2020). Uji Persyaratan Analisis. Analisis Standar Pelayanan Minimal Pada Instalasi Rawat Jalan di RSUD Kota Semarang.
- Wulandari, I. (2022). Model Pembelajaran Kooperatif Tipe STAD (Student Teams Achievement Division) dalam Pembelajaran MI. *Jurnal Papeda: Jurnal Publikasi Pendidikan Dasar*, 4(1), 17–23. <https://doi.org/10.36232/jurnalpendidikandasar.v4i1.1754>
- Yeni, Y. (2020). Pengaruh Model Pembelajaran Kooperatif Tipe Make a Match Berbantuan Video Pembelajaran Terhadap Pemahaman Konsep. Diambil dari <http://repository.radenintan.ac.id/1318>
- 2/
Yusup, F. (2018). Uji validitas dan reliabilitas instrumen penelitian kuantitatif. *Tarbiyah: Jurnal Ilmiah Kependidikan*, 7(1).