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Student learning outcomes with the application of the *team game tournament* learning model in review of student motivation in class XI

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Abstract

This study aims to know whether or not there is an influence between the learning outcomes of students who are taught using the TGT cooperative learning model and that of using direct learning in terms of student motivation. This is a quasi experimental study using Treatment By Level design which is carried out in class XI SMA in Wonosari in the even semester of the 2022/2023 academic year. The study samples are the students in class XI, totalling 71 students. The data are obtained from instruments in the form of multiple choice and questionnaires. Each is used to test mathematics learning outcomes and student motivation. Data analysis uses a two-way analysis of variance and a Scheffe test. The findings show that: 1) The learning outcomes of students who are taught using the TGT learning model are higher than that of using the direct learning model. This content evidenced results obtained F_{count} = 12.701 and F_{table} = 3.98, so $F_{count} > F_{table}$ causes the (H_1) to be accepted. 2) There is interaction influence between the learning model and students' motivation on students' mathematics learning outcomes. This content evidenced results obtained F_{count} = 5.1913 and F_{table} = 3.98, so $F_{count} > F_{table}$ causes the (H_1) to be accepted. 3) The learning outcomes of students with high motivation who are taught using the TGT learning model are higher than that of using direct learning model. This content evidenced results obtained F_{count} = 16.472 and F_{table} = 3.74, so $F_{count} > F_{table}$ causes the (H_1) to be accepted. 4) The learning outcomes of students with low motivation who are taught using the TGT learning model are lower than that of using direct learning model. This content evidenced results obtained F_{count} = 1.420 and F_{table} = 3.74, so $F_{count} < F_{table}$ causes the (H_0) to be accepted.

***Keywords**: Learning Outcomes; Student Motivation; Team Game Tournament Learning Model*

Abstrak

Penelitian ini bertujuan untuk mengetahui apakah ada pengaruh antara hasil belajar matematika siswa yang dibelajarkan menggunakan model pembelajaran kooperatif tipe team game tournament dan pembelajaran langsung ditinjau dari motivasi siswa. Penelitian ini merupakan penelitian eksperimen semu (Quasi Eksperimen) dengan menggunakan desain penelitian treatment by level 2 x 2. Penelitian dilaksanakan pada SMA di Wonosari pada semester genap tahun ajaran 2022/2023 dengan sampel penelitian adalah siswa kelas XI berjumlah 71 siswa. Data penelitian diperoleh dengan instrumen yang berbentuk pilihan ganda dan angket. Masing-masing digunakan untuk tes hasil belajar matematika. Analisi data menggunakan analisis varians dua jalur dan uji *scheffe*. Hasil penelitian menunjukan bahwa 1) hasil belajar siswa yang dibelajarkan dengan model pembelajaran TGT lebih tinggi dibandingkan dengan model pembelajaran langsung, hal ini dibuktikan dengan perolehan nilai F_{hitung}= 12,701 dan F_{tabel}= 3,98 jadi $F_{hitung} > F_{tabel}$ menyebabkan (H_1) diterima; 2) terdapat pengaruh interaksi antara model pembelajaran dan motivasi siswa terhadap hasil belajar matematika siswa, hal ini dibuktikan dengan perolehan F_{hitung} = 5,1913 dan F_{tabel} = 3,98 jadi $F_{hitung} > F_{tabel}$

menyebabkan (H_1) diterima; 3) hasil belajar siswa yang memiliki motivasi tinggi yang *dibelajarkan dengan model pembelajaran TGT lebih tinggi dari yang dibelajarkan dengan model pembalajaran langsung, hal ini dibuktikan dengan perolehan nilai* F_{hitung} *= 16,472 dan* F_{tabel} *= 3,74 jadi* $F_{hitung} > F_{tabel}$ *menyebabkan* (H_1) *diterima.; 4) hasil belajar siswa yang memiliki motivasi rendah yang dibelajarkan dengan model pembelajaran TGT lebih rendah dari pada yang dibelajarkan dengan model pembelajaran langsung, hal ini dibuktikan dengan perolehan nilai* F_{hitung} *= 1,420 dan* F_{tabel} *= 3,74 jadi* $F_{hitung} < F_{tabel}$ *menyebabkan* (H_0) *diterima.*

***Kata kunci**: Hasil Belajar; Motivasi Siswa; Model Pembelajaran Team Game Tournament*

INTRODUCTION

Maths is a science that has an important role in everyday life. Because humans study real things and are always related to mathematics. Mathematics is a basic science that has a role in improving the ability of the nation's next generation by developing thinking and reasoning skills (Jana & Supiati, 2019). In learning mathematics, it is expected to achieve its learning objectives. As for the achievement of students' mathematics learning objectives, it can be passed by their learning outcomes. Student learning outcomes mean a learning behaviour that can generally be seen from changes including attitudes, skills, habits, abilities and observations in the learning process. (Djikilo et al., 2023).

The condition that forms the background of this research problem is the low mathematics learning outcomes in schools. In general, learning outcomes are the abilities that exist in students after obtaining learning experiences (Pitriani et al., 2022). This means that learning outcomes are the mastery of student abilities and have been owned after the student has obtained from a learning experience or taught which covers the cognitive, affective and psychomotor fields. In the cognitive field, it is more dominant than the psychomotor and affective fields, therefore the cognitive domain is used as an investigation of student learning outcomes in this study. The benchmarks for assessing learning outcomes in line with Bloom's Taxonomy framework of the cognitive domain in accordance with the revision of Anderson and Krathwohl are: 1) remember; 2) understand; 3) apply; 4) analyse; 5) evaluate; 6) create. (Nafiati, 2021).

In order for maximum learning results, there needs to be an effort or effort from an early age. Teachers have an important role in achieving student learning success. However, it should be noted that student learning outcomes in mathematics do not solely depend on the efforts of the teacher, but from the student himself (Laknasa et al., 2021). Some students say that mathematics is very difficult, so it causes them to have no desire

to learn it (Kue et al., 2022). In line with the opinion that mathematics is a subject that is difficult to teach or learn, so students often complain about the many formulas, properties and rules that must be remembered and understood when they use it (Usman et al., 2022). Students become lazy to learn and feel uninterested in mathematics, so that the results of learning mathematics are always unsatisfactory. Therefore, teachers are required to be skilled in the teaching process by being able to master or develop various strategies, methods, and how to determine the appropriate learning model that fosters an interesting class, encouraging active student participation. Mathematics learning only revolves around teachers and students, resulting in a passive learning experience (Simamora & Simamora, 2020). The learning model is one that focuses on the educator and prioritises effective lesson plans so that the breadth of information of the teaching material is maximized (Adisusilo, 2012).

Another thing that causes low student learning outcomes is from their learning motivation. Students as people who are learning and developing naturally give different reactions in capturing a lesson in terms of their attitude and motivation. Defines learning motivation, namely student motivation in arousing learning activities, ensuring learning activities and directing to achieve the desired direction of the learning object (Sardiman, 2014). In general, motivation is very helpful to understand and explain the character of individuals who are learning. Motivation in learning has various important roles, namely in (a) showing things that can reinforce learning, (b) clarifying a goal achieved in learning, (c) determining ways to control stimuli in learning, (d) determining persistence towards learning. This means that motivation plays an important role in shaping learning outcomes. Students who are highly motivated, will be better at achieving their learning outcomes than students who are low motivated. This means that highly motivated students will lead to superior learning outcomes because they are always actively involved (Salmawati, 2022).

Generating motivation in students is very difficult. Teachers must be able to think creatively to design a teaching and learning activity in order to achieve learning objectives such as choosing several varied learning models or strategies. But the facts on the ground show that most lectures and excessive practice questions lead to passive student involvement where students only listen to the instructor without being given the opportunity to engage in meaningful discussions with peers (Paputungan et al., 2021). This monotonous classroom teaching eventually becomes boring, so it can reduce student motivation which results in low learning outcomes. It can be seen that the application of

the right learning model affects student motivation and determines the achievement of learning success.

In line with the above problems, the same symptoms the author found when carrying out initial observations at SMA in Wonosari. Student learning outcomes have not yet reached the teacher's wishes. This can be seen from interviews that have been conducted with teachers at the high school who state that the results of student learning achievement in the cognitive aspect are still low or far from average expectations. Then, the results of interviews with several students in the form of their experiences in learning mathematics. They stated that they lacked motivation for mathematics because it was very difficult to learn, and were bored doing problems that were so difficult to understand and the methods or models used by the teacher were less fun. Meanwhile, based on observation, the researcher observed that the direct learning model was mostly used in several classes during the learning process. Based on this, student motivation has an important role, making it the cause of low mathematics learning outcomes.

The effort in addressing this problem is by utilising various learning models that can be implemented in mathematics. In overcoming the above problems, teachers can apply the cooperative learning model. According to Rusman, "cooperative learning is a learning structure where students work together in groups to learn which includes 4-6 students with diverse group members (Prihatmojo & Rohmani, 2020). In line with the statement that "*cooperative learning* is a learning pattern that shows flexibility to students in collaborating with other students to fulfil structured tasks known as cooperative learning (Purnomo, 2021). Several kinds of cooperative learning models. One of them that can be applied to the learning process is the *Teams Games Tournament* (TGT) type. The *Teams Games Tournament* learning model is one of the easiest types of cooperative learning models to use, this model includes the activeness of all students, regardless of their status, the role of peer tutors, and there are games in it (Shoimin, 2017). This causes students to be more motivated and excited when learning, so that they can improve their learning outcomes, because the model is classified as a relaxed but serious model, so students feel comfortable when participating in learning mathematics. The cooperative learning model described by the *Teams Games Tournament* (TGT) type is *class presentation, team, game, tournament,* and *team recognition* (Slavin, 1982).

Research on *Team Game Tournament* type cooperative learning models has been conducted including using the TGT type cooperative learning model to see the difference in the TGT learning model using gamification teaching materials, and not using teaching materials and with conventional models for junior high school students (Adinti et al.,

2021) and research using the TGT type cooperative learning model to see the difference in mathematics learning outcomes using the TGT learning model and the TPS learning model on class IX statistics material (Octapiani et al., 2019). However, there are not many studies of the TGT model that use more than 1 x variable. So that researchers are interested in seeing the effect of the *Team Game Tournament* type cooperative learning model on learning learning outcomes in terms of student motivation in mathematics subjects at SMA in Wonosari.

RESEARCH METHODS

The research took place at SMA in Womosaro on the even semester of the 2022/2023 school year. It was conducted in accordance with the schedule of mathematics subjects at the school. The research was conducted from May to June 2023. This type of research used a method in the form of *quasi-experimental* research (*Quasi Experiment*) which relates various variables, namely dependent learning outcomes, independent variables of learning models namely TGT and direct learning models and moderator variables of motivation (high and low). *Treatment by Level 2 x 2* made the design used in the study.

Grade XI students constitute the population in this study. There were a total of 5 classes with a total of 128 students. To ensure a representative sample, the *Simple Random Sampling* technique was used. The assumption is that all students have homogeneous abilities. In the first step, four classes from the total number of XI classes were randomly selected. These four classes were selected based on their comparable abilities. The selected class is the sample, then divided into two groups, resulting in two different treatments, namely for the TGT learning model in the form of an experimental class, selected XI IPA C class of 26 students and XI IPS B class of 26 students. Then in the control class used direct learning model, selected XI IPA A class of 23 students and XI IPS A class of 28 students.

After the treatment, each class was assigned to a group based on their level of motivation, as determined by the questionnaire results. As a result, there are 4 groups that will undergo a test of students' mathematics learning outcomes, namely: (1) highly motivated students received TGT learning model; (2) low motivated students received TGT learning; (3) highly motivated students received direct learning model for; (4) low motivated students received direct learning model.

To fulfil the research parameters, there are two data required for the needs of this study, namely: (1) students' mathematics learning outcomes, using a 13-item multiple

choice test instrument; (2) students' motivation, using a questionnaire test instrument with 29 questions. In the categorisation of motivation using the criteria:

a) High motivation: Average ≥ X + 0,5 *SD*
b) Medium motivation: X - 0,5 *SD* ≤ Average motivation < X + 0,5 *SD*
c) Low motivation: Average motivation < X - 0,5 *SD*

Data analysis techniques in the form of Two-Way ANOVA TEST, accompanied by a follow-up test known as (*Scheffe* test) were used to test the hypothesis. Before analysing the data, it is necessary to conduct a prerequisite test so that the population variance data is normal and homogeneous. The prerequisite tests are *Liliefors* test (Lo) for normality and *Bartlett* test for homogeneity.

RESULTS AND DISCUSSION

Description of Research Results

In a broad sense, the researcher presents an overview of the data regarding students' mathematics learning outcomes for the eight different groups in **Table 1**.

Table 1. Recap of Research Result Data

Data	N	Min Score	Max Score	Mean	Median	Mode	Standard Deviation
$\mathbf{A_1}$	39	2	13	8,71	8,96	9,10	2,62
$\mathbf{A_2}$	32	2	12	6,88	6,77	6,70	2,18
$\mathbf{B_1}$	36	2	13	8,39	8,41	8,30	2,48
$\mathbf{B_2}$	35	2	10	7,36	7,59	8,30	2,62
$\mathbf{A\ B_{11}}$	18	7	13	9,83	9,83	10,50	1,84
$\mathbf{A\ B_{12}}$	21	2	12	7,64	8,13	8,61	2,72
$\mathbf{A\ B_{21}}$	18	2	10	6,25	6,93	7,10	3,11
$\mathbf{A\ B_{22}}$	14	5	12	6,93	6,25	5,73	1,98

Description:

A_1 = Data on mathematics learning outcomes of students taught with the TGT learning model
A_2 = Data on mathematics learning outcomes of students taught with direct learning model
B_1 = Data on mathematics learning outcomes of highly motivated students
B_2 = Data on mathematics learning outcomes of students who have low motivation
$A\ B_{11}$ = Data on mathematics learning outcomes of highly motivated students taught with the TGT learning model.
$A\ B_{12}$ = Data on mathematics learning outcomes of students who have low motivation who are taught with the TGT learning model.

A B_{21} = Data on mathematics learning outcomes of highly motivated students taught with direct learning model
A B_{21} = Data on mathematics learning outcomes of students who have low motivation taught with direct learning model

Hypothesis Testing

Two-way analysis of variance (ANOVA 2 X 2) was used for hypotheses 1 and 2. This method aims to identify differences in learning outcomes of students taught with the TGT learning model and direct learning model, as well as see the interaction between learning models and student motivation on mathematics learning outcomes. In testing the hypothesis test, the criteria are set in such a way that if the $Fcoun_t$ value exceeds the F_{tabel} value at a significant level, then H is accepted, and vice versa. A = 0,05 then H_1 is accepted, and vice versa.

Table 2 below provides a brief overview of the results obtained from the 2-way ANOVA calculation

Table 2. Two-way ANOVA Calculation Results

Source of Variance	Sum of Squares (*JK*)	Degrees of Freedom (*dk*)	Average Sum of Squares (RJK)	F_{count}	F_{tabel} α = 0,05
Between Learning Models (*A*)	64,79	1	64,79	12,701	3,98
Inter Motivation (*B*)	13,60	1	13,60	2.666	3,98
Interaction of Learning Model and Motivation (*AB*)	26,48	1	26,48	5,1913	3,98
In-Cell Error (*d*)	341,7	67	5,10	-	-
Total (*T*)	447	70	6,38		

In **Table 2**, there is a summary of the calculation results that can be concluded regarding the following research hypothesis tests 1 and 2.

Testing the First Hypothesis

After the calculation, F_{count} = 12.701 is obtained which exceeds F_{tabel} = 3.98 at a significant level α = 0.05 .This shows that the null hypothesis (H_0) is rejected because there is no difference in learning outcomes. On the other hand, the alternative hypothesis (H_1) is accepted because there is a difference in student learning outcomes between the TGT learning model and the direct learning model.

Second Hypothesis Testing

Based on the results of the calculation, $_{Fcount}$ = 5.1913 is obtained which exceeds the value of F_{tabel} = 3.98 at the level of significance α = 0,05 Thus, the null hypothesis (H_0) is rejected which reveals that there is no interaction between learning models and motivation on student learning outcomes is rejected. Therefore**,** the alternative hypothesis (H_1) which reveals that there is an interaction effect between learning models and motivation on student learning outcomes is accepted.

Hypotheses 3 and 4 used a further test known as the *Scheffe* test. This was done for two groups namely: (1) group of highly motivated students taught with TGT and direct learning model; (2) group of low motivated students taught with TGT and direct learning model. At the significant level α = 0,05. The criteria used if F_{count} is higher than F_{tabel} then H_1 is accepted, and vice versa. **Table 3** is the summary result of the calculation.

Table 3. Summary of *Scheffe* Test Calculation

No.	Group	$F_{count,}$ α = 0,05	F_{tabel}	Conclusion
1	A B_{11} with A B_{21}	16,472	3,74	Significant
2	A B_{12} with A B_{22}	1,420	3,74	Not significant

In **Table 3**, conclusions can be drawn regarding tests 3 and 4 as follows.

Third Hypothesis Testing

After analysing the calculations, $_{Fcount}$ = 16.472 was obtained while the value of F_{tabel} = 3.74. Because $_{Fhitung}$ > F_{tabel}, then the hypothesis (H_0) which says that the learning outcomes of highly motivated students taught with TGT learning model are lower or equal to those taught with direct learning model is rejected**.** Thus, the alternative hypothesis (H_1) is accepted which says that the learning outcomes of highly motivated students taught with TGT learning model are higher than those taught with direct learning model.

Testing the Fourth Hypothesis

After evaluating the data obtained $_{Fhitung}$ = 1.420 and *F* value$_{tabel}$ = 3.74. Because $_{Fhitung}$ < F_{tabel} so the hypothesis (H_0) which says that the learning outcomes of low-motivated students taught with TGT learning model is higher than taught with direct learning model is accepted**.** Thus, the alternative hypothesis (H_1) is rejected that the

learning outcomes of low-motivated students taught with the TGT learning model are lower than those taught with the direct learning model.

Differences in Learning Outcomes of Students Taught with TGT Learning Model and Direct Learning Model

According to the results of testing the first hypothesis through the application of the two-way ANOVA test, there is a significant difference in learning outcomes between the TGT learning model and the direct learning model. It can be observed from the average acquisition in each group. The high average obtained by students when taught with the TGT learning model rather than taught with the direct learning model. This indicates the superiority of the TGT learning model over the direct learning model. Consequently, this finding strengthens the hypothesis proposed by the researcher.

This is in line with the opinion of (Solihah, 2016) in the research he has done obtained learning outcomes taught with the TGT learning model higher than the STAD learning model. In addition, the average learning outcomes of students taught with the TGT learning model are higher than the average learning outcomes of students taught with the lecture method and the average learning motivation of students taught with the TGT learning model is higher than the average learning motivation of students taught with the lecture method (Yunita et al., 2020). So in learning, this model can help students to improve their learning outcomes and greatly affect their motivation. Learning activities that contain elements of games, quizzes or tournaments are able to make students actively participate and engage during the learning process (Haryani et al., 2014).

This TGT learning model has several learning steps that can make every student active in the classroom. The steps of the TGT learning model begin with a class presentation where the teacher conveys the learning objectives to be achieved, explains the learning model to be used and provides material to students. The second stage is *Teams* where at this stage students will be formed into groups of 4 to 5 heterogeneous members. Then in the group the teacher will distribute LKPD. Students will discuss and work on the LKPD and will be asked by one group member to present the results. The next stage is *Games & Tournament* where at this stage students will be formed into tournament groups. Each meeting varies the number of groups because each game and tournament given is different. Then at this stage the games are in the form of each group member will work on questions in turn. All points obtained from each group member will be added up and compared points between groups. This can make every student play an active role in the classroom because they have the responsibility to solve each problem.

The last stage is *Team Recognition.* At this stage, it is seen that the highest points obtained by students will become winners in the game and will receive awards from the teacher. Based on TGT learning as described above, it can be seen that it provides a better influence in improving student learning outcomes. The stages of TGT provide opportunities for students to develop understanding in the material so that the learning outcomes obtained are better.

On the other hand, direct learning model is teacher-centred learning to strengthen students' basic competencies and skills as well as to expand the information of teaching materials. This makes student activities only less than teacher activities, because students only listen, take notes or do what the teacher says. So that in the classroom the only interaction is the teacher's explanation as a result students become bored and bored.

The Effect of Interaction Between Learning Model and Motivation on Student Learning Outcomes

The test results related to the second hypothesis show that there is an interaction between learning models and motivation on learning outcomes. Interaction creates a positive synergy between learning models and motivation, so that it produces very optimal results, in the TGT learning model as well as direct learning models affect student learning outcomes, based on high and low motivation can be seen in the average score of student learning outcomes obtained.

It can be seen that the average difference between students taught with the TGT learning model and the direct learning model is very different based on their motivation (high or low). The average magnitude of highly motivated students taught in the TGT learning model rather than the direct learning model, as well as students with low motivation. This states that the TGT learning model has an effect on both high and low motivated students, as well as the direct learning model. The interaction between the two models showed that students' learning outcomes increased depending on students' motivation whether the TGT learning model or direct learning model was used.

Motivation comes from the word motive, which is defined as the driving force or fighting power that encourages someone to do something to achieve a goal (Nazirin, 2018). So that this motivation has an important role in student learning outcomes, therefore teachers must be able to foster student learning motivation in various ways such as using the TGT model so that student motivation is triggered both within students and from outside.

Differences in Learning Outcomes of Students Taught with the Team Games Tournament Learning Model with Direct Learning Model in Groups of Students Who Have High Motivation

After data analysis, it is known that the learning outcomes of highly motivated students taught with the TGT learning model are different from direct learning. This can be seen through the average score of student learning outcomes obtained. The magnitude of the score of learning outcomes of highly motivated students taught with TGT learning model with a value of 9.83 than the score of students when used direct learning model with a value of 6.25. This finding shows that the TGT learning model is very good for highly motivated students.

When researchers conducted experiments for the two learning models, differences were seen in the behaviour of highly motivated students based on the application of the TGT learning model and the direct learning model. Students showed enthusiasm and were very active in performing their responsibilities when the TGT learning model was used. Silberman's view of the TGT learning model developed by Robert Slavin, is a learning system that combines learning with competing against teams, and can be applied in improving the learning of various concepts, skills and facts. (Handayani, 2022). It is different during direct learning where student activity is lacking, but in the learning process the teacher plays an active role. gives the view that the direct learning model is a model that is specifically made to support learning activities in declarative and procedural knowledge (Handayani & Abadi, 2020).However, this does not mean that the direct learning model is not effective for students with high motivation, but in improving student learning outcomes, it will further increase if given the TGT model which places more emphasis on student activity. This is comparable to research which states that the lack of student activity in the learning process is due to the model applied only to direct learning, where more listening to the teacher's explanation. (Yulianti & Gunawan, 2019). However, this does not mean that the model is less effective for students with high motivation, but in order to further improve student learning outcomes if given a learning model that places more emphasis on student activity, namely the TGT learning model.

Differences in Learning Outcomes of Students Taught with the Team Game Tournament Learning Model and the Direct Learning Model in Groups of Students with Low Motivation

After data analysis, the learning outcomes of low-motivated students taught with the TGT learning model were different from direct learning. This difference is observed

in the average score obtained by each group. The magnitude of the average learning outcomes of low-motivated students taught with TGT learning model is 7.64 than the average learning outcomes of students taught with direct learning model of 6.93. This finding indicates that the TGT learning model is better taught to low-motivated students. This shows the finding that the TGT learning model is more suitable to be taught to students who have low motivation, although the difference in the average score between the two groups is only slightly different or by 0.71 which indicates that student learning motivation has a significant effect on student learning outcomes (Sobandi, 2017). Students who have low motivation need encouragement from teachers with various teacher skills in teaching, and the most important thing is the selection of learning models.

Based on this, in general the TGT learning model proved to be a viable option for low-motivated students, but it is important for them to make certain adaptations for the next lesson. In terms of choosing between the TGT learning model or the direct learning model which is more suitable for students with low motivation, the TGT is better. Because it can be observed that the average score achieved in the TGT learning model is greater than the direct learning model.

CONCLUSIONS

The results showed that students who received learning through TGT model obtained higher mathematics learning outcomes than students who were taught using direct learning model. In addition, between learning models and student motivation on students' mathematics learning outcomes are interrelated and there is interaction. Furthermore, highly motivated students achieved higher learning outcomes when taught using the TGT learning model than the direct learning model. While low-motivated students taught with TGT learning model were lower than taught with direct learning model.

ADVICE

Based on the research results obtained that there is a positive influence on the TGT learning model and student motivation on student learning outcomes. As a follow-up suggestion for further research, it is hoped that the TGT learning model can be further improved in terms of games, tournaments that can generate student motivation, and can also be assisted by several learning media and teaching materials, so that students' mathematics learning outcomes can improve.

LITERATURE

Adinti, C., Asih Saputri, D., & Yunian Putra, R. W. (2021). Meningkatkan pemahaman matematis siswa dengan mengaplikasikan model pembelajaran Teams Game Tournament (TGT) berbasis bahan ajar gamifikasi. *PHI: Journal of Mathematics Education*, *5*(2). https://doi.org/10.33087/phi.v5i2.142

Adisusilo, S. (2012). *Pembelajaran nilai karakter: konstruktivisme dan VCT sebagai inovasi pendekatan pembelajaran afektif / Sutarjo Adisusilo*. Rajawali Pers.

Djikilo, F. A., Zakaria, P., Isa, D. R., & Majid, M. (2023). Meningkatkan hasil belajar matematika melalui model pembelajaran open ended di kelas VII-1 SMP Negeri 1 Batudaa. *Journal of Maths and Science Education*, *11*(2), 508–513.

Handayani, N. P. R., & Abadi, I. B. G. S. (2020). Pengaruh model pembelajaran langsung berbantuan media gambar terhadap kompetensi pengetahuan matematika siswa kelas IV SD. *Mimbar Ilmu*, *25*(1), 120–131. https://doi.org/10.23887/mi.v25i1.24767

Handayani, S. (2022). Pengaruh Model Pembelajaran Kooperatif Tipe Teams Games Tournament (TGT) Terhadap Motivasi Belajar Matematika Siswa Kelas IV MI The Noor Bendunganjati Pacet Mojokerto. *Irsyaduna: Jurnal Studi Kemahasiswaaan*, *2* (2), 100–107. https://doi.org/10.54437/irsyaduna.v2i2.471

Haryani, D., Amelia, F., & Yulia, P. (2014). Pengaruh model pembelajaran kooperatif kombinasi STAD dan TGT terhadap hasil belajar matematika siswa kelas VIII di MTs USB Sagulung Batam. *Pythagoras: Jurnal Program Studi Pendidikan Matematika*, *3*(2), 40–45.

Jana, P., & Supiati, E. (2019). Efektivitas model Problem Based Learning ditinjau dari kemampuan pemecahan masalah matematika. *Jurnal Mercumatika : Jurnal Penelitian Matematika Dan Pendidikan Matematika*, *3*(2), 88–93. https://doi.org/10.26486/jm.v3i2.745

Kue, H. A., Badu, S. Q., Resmawan, R., & Zakiyah, S. (2022). Deskripsi hasil belajar matematika siswa di SMP Muhammadiyah Tolangohula. *Research in the Mathematical and Natural Sciences*, *1*(1), 39–46. https://doi.org/10.55657/rmns.v1i1.8

Laksana, P. D. H., Setiawan, T. B., & Setiawan, S. (2017). Proses Berpikir Siswa yang Mengikuti Ekstrakulikuler Bridge pada Penyelesaian Soal Cerita Teori Peluang Berdasarkan Ranah Kognitif Taksonomi Bloom Revisi. *Kadikma*, *8*(1), 172–182.

Nafiati, D. A. (2021). Revision of Bloom's taxonomy: Cognitive, affective, and psychomotor. *Humanika*, *21*(2). https://doi.org/10.21831/hum.v21i2.29252

Nazirin, N. (2018). Pengaruh model pembelajaran kooperatif tipe jigsaw dan motivasi belajar terhadap kemampuan pemahaman konsep PPKN pada siswa kelas IV Sekolah Dasar. *Jurnal Pendidikan*, *19*(2), 132–144. https://doi.org/10.33830/jp.v19i2.174.2018

Octapiani, B., Sutrisno, B., Cahyani, D., STKIP, N., & Negara, K. (2019). Perbedaan hasil belajar matematika materi statistika melalui model Think Pair Share dan Teams Games Tournament. *Proceedings of the National Seminar on Education STKIP Kusuma Negara*.

Paputungan, S., Machmud, T., & Kaku, A. (2021). Pengaruh model pembelajaran Think Pair Share (TPS) terhadap kemampuan pemecahan masalah matematis siswa ditinjau dari motivasi belajar. *Damhil Education Journal*, *1*(2), 54–63. https://doi.org/10.37905/dej.v1i2.1170

Pitriani, N. N., Noviati, P. R., & Juanda, R. Y. (2022). The effect of cooperative learning model type teams games tournament (TGT) based on counting funnel media on mathematics learning outcomes of multiplication material in elementary school. In *PI-MATH-Journal of Eleven April Mathematics Education* (Vol. 1, Issue 1, pp. 1–10).

Prihatmojo, A., & Rohmani, R. (2020). Pengembangan model pembelajaran kooperatif berbasis literasi berkarakter dengan Game Who Am I. *Journal of Education and Instruction (JOEAI)*, *3*(2), 312–321. https://doi.org/10.31539/joeai.v3i2.1608

Purnomo, C. (2021). Model pembelajaran kooperatif tipe make a match untuk meningkatkan hasil belajar. *Journal of Education and Religious Studies*, *1*(2), 53–57. https://doi.org/10.57060/jers.v1i02.22

Salmawati, S. (2022). Pengaruh kecerdasan emosional terhadap hasil belajar matematika siswa kelas VIII SMP Negeri 2 Wawotobi. *Berajah Journal*, *2*(2), 315–320. https://doi.org/10.47353/bj.v2i2.95

Sardiman. (2014). *Interaksi dan motivasi belajara mengajar*. Rajawali Press.

Shoimin, A. (2017). *Model pembelajaran inovatif dalam Kurikulum 2013*. Ar-Ruzz Media.

Simamora, M. I., & Simamora, Y. (2020). Peningkatan kemampuan komunikasi matematika antara siswa yang diajar menggunakan model kooperatif tipe Think Pair Share (TPS) dengan Teams Games Tournament (TGT). *PHI: Jurnal Pendidikan Matematika*, *4*(2), 102–112. https://doi.org/10.33087/phi.v4i2.106

Slavin, R. E. (1982). *Cooperative learning: student teams*. NEA Professional Library.

Sobandi, R. (2017). Pengaruh motivasi belajar terhadap hasil belajar bahasa indonesia pada siswa kelas VIII MTS Negeri 1 Pangandaran. *Jurnal Diskatrasia*, *1*(2), 306–310. https://doi.org/10.25157/diksatrasia.v1i2.634

Solihah, A. (2016). Pengaruh model pembelajaran Teams Games Tournament (TGT) terhadap hasil belajar matematika. *SAP (Susunan Artikel Pendidikan)*, *1*. https://doi.org/10.30998/sap.v1i1.1010

Usman, P., Yahya, L., Bito, N., & Takaendengan, B. R. (2022). Efektivitas pembelajaran matematika menggunakan multimedia pada materi kerucut. *Jambura Journal of Mathematics Education*, *3*(2). https://doi.org/10.34312/jmathedu.v3i2.10628

Yulianti, E., & Gunawan, I. (2019). Model pembelajaran problem based learning (PBL): efeknya terhadap pemahaman konsep dan berpikir kritis. *Indonesian Journal of Science and Mathematics Education*, *2*(3), 399–408. https://doi.org/10.24042/ijsme.v2i3.4366

Yunita, A., Juwita, R., & Kartika, S. (2020). Pengaruh penerapan model pembelajaran kooperatif tipe teams games tournament terhadap hasil belajar matematika siswa. *Mosharafa: Jurnal Pendidikan Matematika*, *9*(1), 23–34. https://doi.org/10.31980/mosharafa.v9i1.606