

APPLICATION OF TEAMS GAMES TOURNAMENT (TGT) LEARNING MODEL TO IMPROVE STUDENTS MATHEMATICAL COMMUNICATION ABILITIES (EXPERIMENTAL RESEARCH OF JUNIOR HIGH SCHOOL STUDENTS)

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Abstract

Mathematical communication skills need to be developed, because through these students can do mathematical thinking organizations in the form of oral or written. The purpose of this study was to determine the improvement of mathematical communication skills between students whose learning using the TGT model and traditional learning. The population in this study were students of class VII junior high school on year 2015/2016. Sampling in this study is a simple random sampling and the method used in this study is a quasi-experimental study using mathematical communication skills tests. The data processed in this study, namely the gain index is processed using the average two similarity test. Based on the data analysis of the gain index value by the two average similarity test results obtained t count = 0.1382 and t table = 0.1456, with a significance level of 5%. Because t count is outside the $-t$ table to t table intervals, it can be concluded that H_0 is rejected, meaning that there is a difference in the increase in mathematical communication skills between students who are learning using the Teams Games Tournament (TGT) model and the traditional model.

Keywords: Mathematical Communication Abilities, Teams Games Tournament (TGT)

Abstrak

Kemampuan komunikasi matematis butuh untuk dikembangkan, karena melalui ini siswa dapat melakukan pengorganisasian pemikiran matematis dalam bentuk lisan maupun tulisan. Tujuan penelitian ini adalah untuk mengetahui peningkatan kemampuan komunikasi matematik antara siswa yang pembelajarannya menggunakan model TGT dan siswa yang menggunakan pembelajaran tradisional. Populasi pada penelitian ini adalah siswa kelas VII Tahun Pelajaran 2015/2016. dengan cara pengambilan sampel *simple random sampling*. Metode yang digunakan pada penelitian ini yaitu kuasi eksperimen dengan menggunakan tes kemampuan komunikasi Matematik. Data yang diolah dalam penelitian ini yaitu indeks gain diolah menggunakan uji kesamaan dua rata-rata. Berdasarkan analisis data nilai indeks gain dengan uji kesamaan dua rata-rata diperoleh hasil $t_{hitung} = 0,1382$ dan $t_{tabel} = 0,1456$, dengan taraf signifikansi 5%. Karena t_{hitung} berada di luar interval $-t_{tabel}$ sampai dengan t_{tabel} maka dapat disimpulkan bahwa H_0 ditolak artinya terdapat perbedaan peningkatan kemampuan komunikasi matematik antara siswa yang pembelajarannya menggunakan model *Teams Games Tournament* (TGT) dengan model tradisional.

Kata Kunci: Kemampuan Komunikasi Matematik, *Teams Games Tournament* (TGT)

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INTRODUCTION

Learning mathematics is a psychological process in the form of an active activity in an effort to build, understand or master mathematical material in order to achieve learning goals. Mathematical learning is a social activity that involves an active process of interaction, where students must accept mathematical ideas through listening, reading and making visualizations. One of the objectives of learning mathematics is to communicate ideas with symbols, tables, diagrams, or other media to clarify the situation or problem (Soemarmo U, 2014). So the mathematical communication skills really need to be developed, because through mathematical communication students can do mathematical thinking organizations in the form of oral or written.

The role of mathematical communication is to understand mathematical ideas correctly. Students who have mathematical communication skills tend to be able to make diverse representations, making it easier for students to get alternatives to solve various mathematical problems. The importance of mathematical communication skills was also raised by Clark (Kartono, Sunarmi., 2015) "Mathematical communication is a way of sharing ideas and clarifying understanding. Through communication ideas can be reflected, improved, discussed, and developed".

But in reality in the field there are still many students who have difficulty learning mathematics, as evidenced by the low student achievement. In addition, students have many difficulties in communicating ideas, ideas, information and so on, both oral and written in the teaching and learning process. This is closely related to students' mathematical communication skills which are still low. The low ability of mathematical communication is evidenced from a study conducted by Setiawan (Herlina, et al., 2012), his research found that "the difference in the average communication score of the experimental group and the control group was around 20%. If examined based on school qualifications and based on a minimum completeness limit of 60%, it turns out that in good school qualifications only 9 people (30%) students were declared complete and the rest (70%) were incomplete for the experimental class, whereas in the control class all students (100 %) incomplete. For medium school qualifications in the experimental class 3 people (100%) students were declared complete and the rest (90%) were declared incomplete, while in the control class all students (100%) were incomplete."

One effort that can be done is to choose and use a more varied learning model. One model that is thought to be able to improve mathematical communication skills is to use the TGT model. The understanding of TGT is one type of cooperative learning that is easy to implement, involves the activities of all students without any difference in status, involves the role of students and contains elements of play and reinforcement (Komalasari, 2010).

This model has a dimension of excitement obtained from the use of the game. Learning activities with games in the Model Teams Games Tournament (TGT) enable students to learn to relax, while fostering a sense of responsibility and fair competition. Meanwhile, the existence of an academic tournament in the Teams Games Tournament (TGT) model can stimulate students to communicate their mathematical ideas because they are directly involved in the teaching and learning process.

Relevant to the statement above, a study conducted by Purnamasari, Y. (2014), which concluded that increasing the reasoning ability and mathematical connections of students who take learning using the Teams Games Tournament (TGT) model is better than increasing the ability of students who take instructional learning live. From these conclusions, it is hoped that the TGT model can also improve mathematical communication skills.

METHOD

The research method used in conducting this research is experimental research. Arikunto (2007:

207) argues that "Experimental research is research that is intended to determine whether there is a result of "something" imposed on the subject of inquiry. In other words, experimental research tries to examine whether there is a causal relationship. The trick is to compare one or more comparison groups that did not receive treatment."

The purpose of this research by using experimental research methods is to determine whether there is a causal relationship between the independent variable (TGT learning model) and the dependent variable (mathematical communication skills). By giving treatment to the experimental group or class and making the control class as a comparison that does not get treatment. The type of research used is quasi-experimental or quasi-research, that is, research that cannot meet the requirements to conduct pure research (true experiment). One of them, because in taking the sample the researcher did not do it randomly, but was provided by the teacher in the school where the researcher made it as the research subject.

The research design that will be used in this study is the pre-test-final control group design test with one kind of treatment. "The pre-test - the final control group design test with one treatment. In this model, before the treatment begins, both groups are given a preliminary test or pre-test to measure the initial conditions (O_1). Furthermore, the experimental group is given treatment (x) and the comparison group is not. After the treatment was completed both groups were given another test as the post-test (O_2)" (Arikunto, 2007).

The design to be used can be discussed as follows.

E: $O_1 \times O_2$

P: $O_1 \quad O_2$

Information:

E = Experiment Class

P = Comparative class or control class

O_1 = Pre test

O_2 = Post test

\times = Treatment of the experimental class, the learning process using the TGT learning model

RESULTS AND DISCUSSION

The results of this study are in the form of a mathematical communication ability test. Data analysis of mathematical communication ability tests conducted on the initial and post tests aims to find out the improvement of students' mathematical communication skills after being given a different treatment.

Pre-Test Data Description

Before learning takes place, the first two classes are preliminary tests to determine students' initial abilities. The student test results are in figure 1.

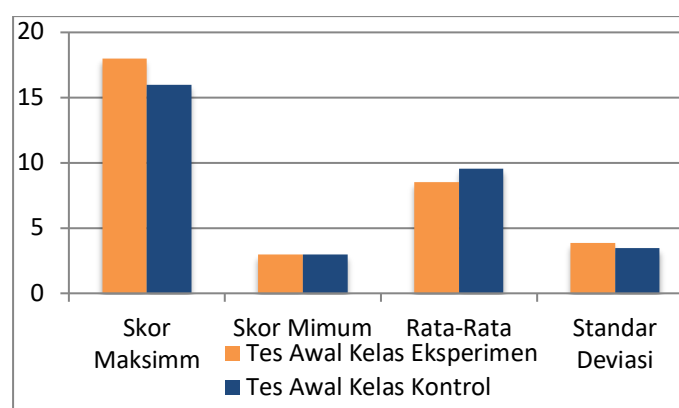


Figure 1. Pre-Test Data

In the diagram above it appears that the highest value is 18, the lowest value is 3, with an average value of the experimental class and the control class of 8.54 and 9.56. This indicates that the initial ability of control class students is higher than the experimental class.

Post-Test Data Description

After learning ends both classes are given a post test to find out the improvement in students' mathematical communication skills. The final student test results are in figure 2.

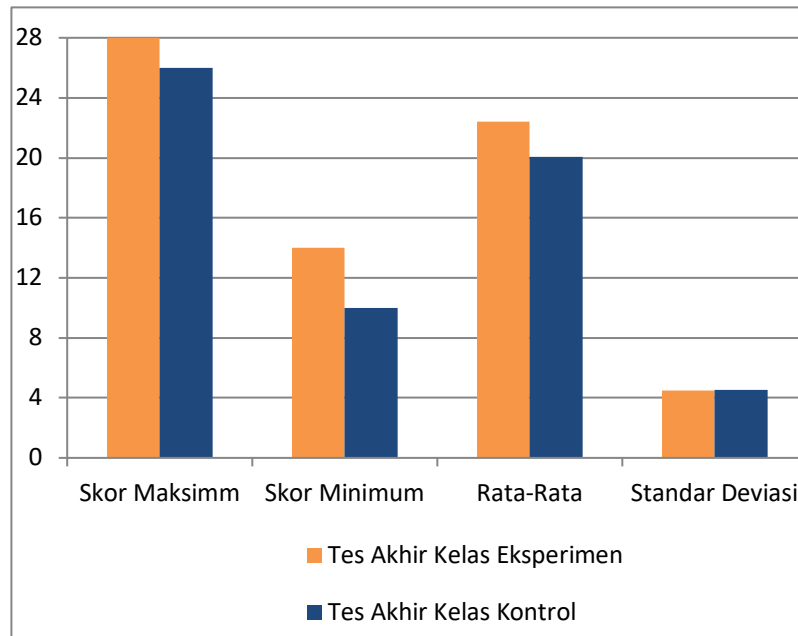


Figure 2. Post-Test Data

In the diagram above it appears that the highest and lowest values obtained by the control class are 26 and 10, with an average value of the experimental class and the control class of 22.41 and 20.08. This indicates that students' mathematical communication skills after being given a different treatment that is in the experimental class (learning using the TGT model) is higher than the control class (learning using the traditional model).

Description of Gain Index Data

The gain index calculation is performed to determine the increase in students' mathematical communication skills before and after being treated in the experimental class and the control class. The gain index results are known by calculating the pre test and post test data. The data obtained from the gain index of the experimental class and the control class are in figure 3.

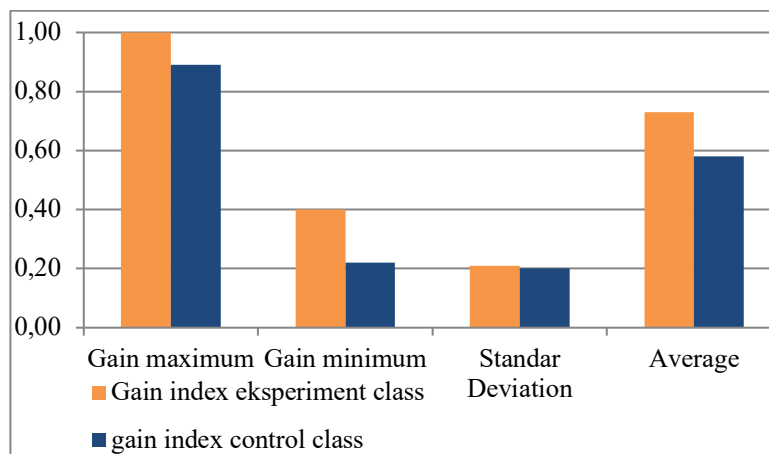


Figure 3. Gain Index

In the diagram above it can be seen that the highest and lowest gain indices obtained by the control class are 0.89 and 0.22, with an average score of the experimental class and the control class of 0.73 and 0.58. This indicates that increasing students' mathematical communication skills in the experimental class is better than the traditional class.

Determine the hypothesis

H0 : $\mu_1 = \mu_2$, meaning that there is no difference in increased communication skills between students whose learning uses the TGT model and students whose learning uses the traditional model.

H1 : $\mu_1 \neq \mu_2$, meaning that there are differences in the improvement of communication skills between students whose learning uses the TGT model and students whose learning uses the traditional model.

With the following testing criteria. Accept H0 if $-t_{table} \leq t_{count} \leq t_{table}$. Reject H0 has another price

The results of the t-test calculations are obtained t-count and t-table as follows.

Table 1. Result of t-test calculation

Class	n	\bar{x}	t_{hitung}	t_{tabel}
Experiment	37	0,7306	13,3185	1,99394
Control	36	0.5811		

In table 1, it can be seen that tcount = 13.318 and t tabely obtained from $t(0.05; 71) = 1.99394$. Because t count is outside the interval -t table up to t table, it can be concluded that H0 is rejected, meaning that there is a difference in the increase in communication skills between the experimental class and the control class.

CONCLUSION

Based on the results of research on the use of the Teams Games Tournament (TGT) learning model in an effort to improve students' mathematical communication skills and data analysis, it can be concluded Increased mathematical communication skills of students whose learning using the TGT model is better than students whose traditional learning. Based on the data analysis of the gain index value by the two average similarity test results obtained t count = 0.1382 and t table = 0.1456, with a significance level of 5%. Because t count is outside the -t table to t table intervals, it can be concluded that H₀ is rejected, meaning that there is a difference in the increase in mathematical communication skills between students who are learning using the Teams Games Tournament (TGT) model and the traditional model.

ACKNOWLEDGMENTS

I devote this research to finding innovative models in the field of mathematics especially in junior high schools which hopefully can be taken into consideration for applying the TGT learning model in the learning process in the classroom in an effort to improve students' mathematical communication skills and other abilities.

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REFERENCES

Arikunto, Suharsimi. (2007). *Manajemen Penelitian*, Jakarta: Rineka Cipta.

- Hendriana, H.H. dan Soemarmo, U. (2014). *Penilaian Pembelajaran Matematika*. Bandung: Refika Aditama.
- Kartono, sunarmi. (2015). *Analisis Kemampuan Komunikasi Matematik siswa kelas VII smp pada Model Pembelajaran TSTS dengan Pendekatan Scientific*. Dalam *Unnes Journal of Mathematics Education* [Online], 7 halaman. Tersedia: http://journal.unnes.ac.id/artikel_sju/pdf/umje/7452/5256 [11 Januari 2016].
- Komalasari, K.(2010). *Pembelajaran kontekstual konsep dan aplikasi*. Bandung: PT. Refika Aditama.
- Purnamasari, Yanti. (2014). *Pengaruh model pembelajaran kooperatif tipe Teams Games Tournament (TGT) terhadap kemandirian belajar dan peningkatan kemampuan penalaran dan koneksi matematik peserta didik SMPN 1 kota Tasikmalaya* [Online], Vol 2 (2), 11 halaman. Tersedia: <http://Pasca.ut.ac.id/journal/index.php/JPK/article/viewfile/3/3> [20 Mei 2016].