



Effectiveness of the Team Games Tournament Model Assisted by Photomath Interactive Learning Media

Anjani Aprilia^{1)*}, Ria Faulina¹⁾

¹⁾Department of Mathematics Education, STKIP PGRI Bangkalan. Jawa Timur, Indonesia.

Received: 02 April 2024

Revised: 18 April 2024

Accepted: 30 April 2024

Abstract

Education as a human effort to grow and develop talents and potentials that are owned from birth. To understand science, mathematics education needs to be mastered by students to help them digest the sciences that will come later at a higher level. Based on data released by Worldtop20.org, Indonesia's education ranking in 2023 is ranked 67th out of 203 countries in the world, this shows that interest in learning in Indonesia is still relatively low. This study aims to determine the effectiveness of the TGT (Team Games Tournament) model assisted by Photomath interactive learning media on Algebra material. The results of descriptive statistics show that the application of the TGT (Team Games Tournament) learning model assisted by Photomath interactive learning media on Algebra material has met the indicators of completeness. It can be concluded that math learning is efficient from the implementation of the TGT (Team Games Tournament) model assisted by Photomath interactive learning media on Algebra material in class VII-A SMP Negeri 1 Socah which is observed through student learning outcomes, student responses, and student activities. This can be seen through the results of data analysis which overall reached a value of ≥ 75 or can be said to exceed the target set.

Keywords: learning outcomes; mathematics learning; student activities; student responses; teams games tournament.

INTRODUCTION

Education as a human endeavor to grow and develop the talents and potential possessed from birth both physically and spiritually in accordance with the values that exist in social life and culture. Education is an effort to help students so that they can perform their duties independently and carry out their responsibilities. Thus education is everything that affects the growth, change and condition of every human being. The changes that occur are the development of the potential of students, both knowledge, skills, and attitudes in their lives (Pristiwanti et al., 2022). To understand science, math education needs to be mastered by students to help them digest the sciences that will come later at a higher level (Satria, 2012).

Mathematics is one of the subjects that has an important role in education, both in developing logical thinking skills, critical thinking, and problem solving skills. Mathematics is formed as a result of human thinking related to ideas, processes, and reasoning. Mathematics needs to be given to all students as a basis for improving logical thinking, analysis, systematic, critical and working skills. Realizing the importance of mathematics, mathematics is necessary to be understood and mastered by all levels of society, especially elementary school students to universities (Kusumawardani et al., 2018)

Mathematics learning in Indonesia still uses the usual methods that tend to be traditional, in the sense that technology is still relatively minimal used in daily mathematics learning activities. The issue of using technology in mathematics learning is an important issue to discuss and efforts need to be made to implement it. In the learning process, the teacher conveys

* Author Correspondence. E-mail: aanjani866@stkipgri-bkl.ac.id

learning material using only textbook media to students and immediately gives assignments, without reviewing the extent to which students understand the material that has been delivered. So that there are still many students who do not fully understand the material (Rahmawati, 2021).

Based on data released by Worldtop20.org, Indonesia's education ranking in 2023 is 67th out of 203 countries in the world. Indonesia ranks alongside Albania in 66th position and Serbia in 68th position. Worldtop20.org is a site that often shares education rankings from various countries, one of which is the World Top 20 Education Poll. The site collects statistical data collected from 6 international organizations including OECD, PISA, UNESCO, EIU, TIMSS, and PIRLS. This poll is conducted by a non-profit organization in the field of education, New Jersey Minority Educational Development (NJ MED) (Yusro, 2023).

Students' interest in learning mathematics is still low, causing low student scores. The reason is because the teacher uses a monotonous model in the form of a lecture model only, and the teacher only uses traditional media in the form of posters. There are several studies that examine the application of learning media in improving student understanding. One of them is research conducted by (Usmeldi, 2017) which intends to suggest the effectiveness of utilizing interactive learning media with Autorun software to increase students' physics skills. So that researchers provide solutions Teams Games Tournament (TGT) learning model. (Kusumawardani et al., 2018b). TGT is one of the cooperative learning models which consists of classical presentation, grouping, games, tournaments, and group awards (Pitriani et al., 2022). The TGT learning model is by forming small groups of four to six people who have different backgrounds in academic ability, gender or sex, race, or ethnicity (Fauziyah & Anugraheni, 2020). In TGT learning, the concept of games is used so that technology-based learning media is needed in combination with Photomath media.

The use of technology-based learning media has become an interesting topic in education. Technology-based learning media, such as software, learning videos, and mobile applications, have the potential to improve the quality of learning and facilitate student understanding through the use of visual, interactive, and multimedia. (Jufrizen, 2018). The utilization of technology as a learning medium by students is the use of applications that also help them to complete the tasks given by educators. Learning Mathematics using android-based applications can facilitate learning math, one application that can be used is Photomath (Derianto et al., 2023).

Photomath is an application that is accessed via a smartphone and contains features to help students solve math subject problems. So that many educators utilize technology as a learning medium with the aim of making it easier for students to learn and understand mathematical concepts related to problems that are difficult to solve, especially in understanding the concept of solving problems related to mathematical problems (Avanda & Putri, 2020).

The research conducted by (Fitri et al., 2022). This study aims to observe students' understanding as well as the utilization of the Photomath application on students' daily lives at school. The result of the study is to provide training to students on how to utilize mathematics applications downloaded via mobile phones or android in this case the photomath application can help students in understanding mathematics learning materials.

This study aims to test effectiveness of team games tournament model assisted by photomath interactive learning media on algebra material in class VII-A SMP Negeri 1 Socah". It is expected that this study will provide new insights to students of class VII-A at SMP Negeri 1 Socah about the benefits of using technology-based learning media in improving student achievement. In addition, this research can also provide input for technology-based learning

media developers to optimize features that can increase the effectiveness of the media. (Susanto, 2011).

METHODS

Based on a review of the type of data, the research approach used in this research is quantitative. This approach is carried out to develop and use mathematical models, theories or hypotheses related to a phenomenon (Abdullah, 2015). Descriptive research is research that aims to collect information about the status of an existing symptom, namely symptoms that exist at the time the research is conducted. The type of quantitative descriptive research used in this study is to obtain information about the ability of students who influence critical thinking in class VII-A students in Mathematics subjects at SMP Negeri 1 Socah in an in-depth and comprehensive manner (Yaqin et al., 2018). In addition, the quantitative approach is expected to reveal the situation and problems at hand. The type of descriptive quantitative research used in this study is to obtain information about student abilities that influence the understanding of the concepts of students in class VII-A in Mathematics at SMP Negeri 1 Socah in an in-depth and comprehensive manner. In addition, with a quantitative approach, it is hoped that the situation and problems faced can be revealed (Ardhini, 2023).

The sampling technique in this study used the Simple Random Sampling technique. This technique is named so because in the sampling the researcher mixes the subjects in the population so that all subjects are considered the same (Abdullah, 2015). This simple random sampling technique is simple because taking sample members from the population is done randomly without paying attention to the strata in the population, this method is done when the population members are considered homogeneous. In this study the class used as a sample was class VII-A with the research subject of class VII-A students of SMP Negeri 1 Socah totaling 32 students. The population in this study were all seventh grade students at SMP Negeri 1 Socah. Where it consists of 3 classes VII-A to VII-C with a total of 50 male students and 32 female students (Raudah et al., 2017).

Data collection techniques utilized in this study include questionnaires, tests, and observations. Furthermore, the data analysis technique applied in this study is descriptive statistics, namely the type of statistics used to review the data that has been collected with an effort to illustrate the information in line with the available evidence without aiming to create conclusions that can be accepted universally. The data to be studied is also described, namely the data obtained from the analysis of learning response questionnaires, student learning outcomes, and observations (Dewi & Handayani, 2022). The determination of student learning outcomes can use a percentage formula as below:

$$\text{Classical provision, } KK = \frac{ST}{N} \times 100\% \dots\dots\dots(1)$$

With description, KK : Classical Completeness, ST : Total students who are complete, and N: Total students. Calculation of student response scores and student activity scores using the formulation:

$$P = \frac{n}{N} \times 100\% \dots\dots\dots(2)$$

With description: P = Assessment percentage (%), n = Number of scores obtained, and N= Total maximum score.

RESULTS AND DISCUSSION

The research data were analyzed using descriptive statistical analysis. Descriptive statistical analysis is intended to describe the characteristics of research subjects before and after mathematics learning, learning implementation, student learning outcomes, student

responses during the learning process, and student activities towards mathematics learning through the application of the TGT (Team Games Tournament) learning model assisted by Photomath interactive learning media on Algebra material in class VII-A SMP Negeri 1 Socah (Dewi & Arini, 2022).

The value of learning outcomes of students in Class VII-A SMP Negeri 1 Socah after the learning process through the application of the TGT (Team Games Tournament) learning model assisted by Photomath interactive learning media on Algebra material with the highest score is 100 and the lowest score is 70. Furthermore, the data on learning outcomes after learning through the application of the TGT learning model assisted by Photomath interactive learning media on Algebra material (posttest) categorized based on the completeness criteria can be seen as follows Table 1.

Table 1. Indicators of Success Score

No.	Score	Category
1.	0-74	Not Complete
2.	75-100	Complete

There are 2 students who fall into the category of not yet complete while the other 30 students fall into the category of complete, so that the KK formula above refers to the indicator of success value (Sugiyono, 2019) Then $KK = 93.75\%$. From the description above, it can be concluded that the learning outcomes of class VII-A students at SMP Negeri 1 Socah after the application of the TGT learning model assisted by Photomath interactive learning media on Algebra material have met the indicators of classical learning completeness. So it can be stated that the learning outcomes of students in class VII-A at SMP Negeri 1 Socah meet the percentage of classical completeness because it is $\geq 75\%$.

The results of data analysis of student responses to the implementation of mathematics learning through the application of Team Games Tournament) learning aided by Photomath interactive learning media on Algebra material filled out by 32 students in brief (Syofian et al., 2015). Student responses to mathematics learning through the application of the Team Games Tournament model assisted by Photomath interactive learning media on Algebra material are said to be positive if the percentage assessment of student answers to 10 statement indicators is included in the positive category if the percentage is obtained $\geq 75\%$ (Sugiyono, 2019). With a value score:

Table 2. Student Response Score

Score									
125	128	106	128	128	128	128	128	128	126

With the total score obtained of 1,258 and the maximum score of 1,280, $P = 98.28\%$ was obtained.

Table 3. Student Response Interpretation

Score Criteria	Percentage (%)	Category
1	76-100	Strongly Agree
2	51-75	Agree
3	26-50	Less Agree
4	0-25	Disagree

The table 3 is the interpretation of the student response questionnaire (Syofian et al., 2015). Thus, the application of Team Games Tournament learning assisted by Photomath interactive learning media on Algebra material received a positive response from students with a category of strongly agree (SS) achieving effectiveness which is $\geq 75\%$.

Student activity towards learning mathematics through the application of the TGT (Team Games Tournament) learning model assisted by Photomath interactive learning media on Algebra material is said to be positive, the percentage of student observation assessment of 10 indicators is said to be positive if the percentage is $\geq 75\%$ (Sugiyono, 2019).

Table 4. Student Activity Score

Score									
24	21	19	21	24	24	24	24	24	24

With the total score obtained 229 and the maximum score is 240 so that obtained $P = 95.42\%$

Table 5. Student Response Interpretation

Score Criteria	Percentage (%)	Category
1	76-100	Strongly Agree
2	51-75	Agree
3	26-50	Less Agree
4	0-25	Disagree

The use of TGT model assisted by Photomath application was declared effective in terms of student activity, because the percentage of student activity category Very Good (SB) reached $\geq 75\%$.

Based on the results of research data analysis, mathematics learning is effective through the application of the Team Games Tournament model assisted by Photomath interactive learning media on Algebra material in class VII-A SMP Negeri 1 Socah. The mathematics learning outcomes of VII-A grade students at SMP Negeri 1 Socah after learning through the application of the TGT (Team Games Tournament) model assisted by Photomath interactive learning media on Algebra material are included in the complete category with a value of 93.75%. So that student learning outcomes after learning through the application of the TGT (Team Games Tournament) model assisted by Photomath interactive learning media on Algebra material are classically complete, namely $\geq 75\%$.

Students' responses to learning mathematics through the application of the Team Games Tournament model assisted by Photomath interactive learning media on Algebra material are said to be positive because the percentage assessment of students' answers to 10 statement indicators is included in the positive category which gets a percentage of 98.28% including the SS (Strongly Agree) category so that it can be said that the application of Team Games Tournament learning assisted by Photomath interactive learning media on Algebra material gets a positive response from students with the category Strongly Agree (SS) reaching effectiveness which is ≥ 75 . The following matter is in line with research researched by (Fitri et al., 2022), The results of this study indicate that the implementation of mathematics applications downloaded from smartphones or android in the following matter photomath application is able to support students in exploring mathematics learning materials.

Observations were carried out by observing student activity, the data obtained from the instrument was summarized at the end of each meeting. Observations were made of 3 male students and 3 female students with the categories of active, moderate, and not very active students. Student activity towards learning mathematics through the application of the Team

Games Tournament learning model assisted by Photomath interactive learning media on Algebra material is said to be positive because the percentage value reaches 95.42% including the category Very Good (SB). This is in line with research conducted by (Sibuea, et al., 2022), based on the results of evaluations conducted by 80% of students were able to achieve a score of 75 or more, and this shows that students have been able to apply mathematical applications in understanding and solving math problems. In addition, this study is also in line with research conducted by (Derianto, et al., 2023) that the use of Photomath applications in mathematics lessons can improve student learning outcomes.

CONCLUSION

According to the results of the research data analysis and the explanation previously described, it can be concluded that efficient mathematics learning from the implementation of the Team Games Tournament model assisted by Photomath interactive learning media on Algebra material in class VII-A SMP Negeri 1 Socah which is observed through student learning outcomes, student responses, and student activities. This can be seen through the results of data analysis which overall reached a value of ≥ 75 or can be said to exceed the target set. According to these conclusions, in order to improve student learning outcomes, student responses, and student activities, a number of inputs are spoken including: (1) the school of SMP Negeri 1 Socah is intended to be able to apply the TGT (Team Games Tournament) model assisted by Photomath interactive learning media when learning activities take place, especially in mathematics subjects; (2) it is intended for teachers to direct students to be active in learning activities so that the implementation of the TGT (Team Games Tournament) model assisted by Photomath interactive learning media can run properly; (3) for students, it is intended to be able to apply the knowledge gained through the teacher and always increase understanding for each lesson so that learning outcomes increase.

REFERENCES

- Abdullah, M. (2015). *Metode Penelitian Kuantitatif* (1st ed.). Aswaja Pressindo.
- Ardhini, Z. (2023). *Pengertian Skala Likert, Metode, dan Contohnya untuk Penelitian*. Detikbali. <https://www.detik.com/bali/berita/d-6607480/pengertian-skala-likert-metode-dan-contohnya-untuk-penelitian>
- Avanda, A. Y., & Putri, S. A. W. (2020). Eksistensi Aplikasi Photomath dalam Pembelajaran Matematika pada Siswa Sekolah Menengah Atas (SMA). *Prosiding Seminar Pendidikan Matematika Dan Matematika*, 2(2721), 1–8. <http://prosiding.himatikauny.org/index.php/prosidinglsm/article/view/106/43>
- Derianto, Putra, M., & Sari, I. K. (2023). Montasik Aceh Besar. *Jurnal Ilmiah Mahasiswa*, 4(1), 154–164.
- Dewi, N. W. D., & Handayani, I. G. A. (2022). Peranan Aplikasi Photomath Dalam Pembelajaran Matematika Di Era Literasi Digital (Kajian Pustaka). *Suluh Pendidikan*, 20(1), 94–101. <https://doi.org/10.46444/suluh-pendidikan.v20i1.411>
- Fauziyah, N. E. H., & Anugraheni, I. (2020). Pengaruh Model Pembelajaran TGT (Teams Games Tournament) Ditinjau dari Kemampuan Berpikir Kritis Pada Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, 4(4), 850–860. <https://doi.org/10.31004/basicedu.v4i4.459>
- Fitri, M., Sibuea, L., Sembiring, M. A., Lubis, I. A., Agus, T. A., Studi, P., Informasi, S., Tinggi, S., Dan, I., & Royal, K. (2022). Pemanfaatan Aplikasi Photomath Sebagai Media

- Belajar Matematika. *Jurnal Pemberdayaan Sosial dan Teknologi Masyarakat*, 2(1). <http://jurnal.goretanpena.com/index.php/JPSTM>
- Jufrizen. (2018). Peran Motivasi Kerja Dalam Memoderasi Pengaruh Kompensasi Dan Disiplin Kerja Terhadap Kinerja Karyawan. *Pemberdayaan Dan Penguatan Daya Saing Bisnis Dalam Era Digital*, 405–424.
- Kusumawardani, D. R., Wardono, & Kartono. (2018a). Pentingnya Penalaran Matematika dalam Meningkatkan Kemampuan Literasi Matematika. *PRISMA, Prosiding Seminar Nasional Matematika*, 1(1), 588–595.
- Kusumawardani, D. R., Wardono, & Kartono. (2018b). Pentingnya Penalaran Matematika dalam Meningkatkan Kemampuan Literasi Matematika. *PRISMA, Prosiding Seminar Nasional Matematika*, 1(1), 588-. <https://journal.unnes.ac.id/sju/index.php/prisma/>
- Munjiati. (2021). Meningkatkan Hasil Belajar Ppkn Pada Materi Sistem Dan Dinamika Demokrasi Pancasila Melalui Model Pembelajaran Kooperatif Tipe Quick On The Draw Kelas Xi Man 1 Banda Aceh. *Jurnal Pendidikan Dan Pengabdian Vokasi*, 2(2), 227–232.
- Pitriani, N. N., Noviati, P. R., & Juanda, R. Y. (2022). Pengaruh Model Pembelajaran Kooperatif Tipe Teams Games Tournament (Tgt) Berbasis Media Corong Berhitung Terhadap Hasil Belajar Matematika Materi Perkalian Di Sekolah Dasar. *PI-MATH-Jurnal Pendidikan Matematika Sebelas April*, 1(1), 1–10.
- Pristiwanti, D., Badariah, B., Hidayat, S., & Dewi, R. S. (2022). Pengertian Pendidikan. *Pendidikan Dan Konseling*, 4(6), 7911–7915.
- Puspita Dewi, I. A. K. S., & Arini, N. W. (2020). The Positive Impact of Teams Games Tournament Learning Model Assisted with Video Media on Students' Mathematics Learning Outcomes. *Journal of Education Technology*, 4(3), 367–376. <https://doi.org/10.23887/jet.v4i3.27099>
- Rahmawati, N. (2021). *Ini Data Platform Belajar Online Selama Pandemi dan Platform Baru Belajar Online Teknologi Cloude dari Google*. EDU Talk. <https://www.depoedu.com/2021/10/16/edu-talk/ini-data-platform-belajar-online-selama-pandemi-dan-platform-baru-belajar-online-teknologi-cloud-dari-google/>
- Raudah, Zubaidah, T., & Santoso, I. (2017). Efektivitas Sterilisasi Metode Panas Kering Pada Alat Medis Ruang Perawatan Luka Rumah Sakit Dr. H. Soemarno Sosroatmodjo Kuala Kapuas. *Jurnal Ke*, 12(1), 425–430.
- Satria. (2012). *Mutu Pendidikan Matematika di Indonesia Masih Rendah*. Univeritas Gadjah Mada.
- Sugiyono. (2019). *Metode Penelitian dan Pengembangan Cetakan Ke-4*. Alfabeta.
- Susanto, D. (2011). Pertumbuhan Ekonomi, Sektor Unggulan Dan Kesenjangan Pada Empat Kabupaten Di Pulau Madura. *Jurnal Ekonomi Pembangunan*, 9(1), 42–62.
- Syofian, S., Setiyaningsih, T., & Syamsiah, N. (2015). Otomatisasi Metode Penelitian Skala Likert Berbasis Web. *Jurnal.Ftumj*, 1–8.
- Usmaldi, U. (2017). Efektivitas Penerapan Media Pembelajaran Interaktif Dengan Software Autorun Untuk Meningkatkan Kompetensi Fisika Siswa Smk Negeri 1 Padang. *Jurnal Eksakta Pendidikan (Jep)*, 1(1), 79. <https://doi.org/10.24036/jep/vol1-iss1/38>
- Yaqin, K., Karim, Y., & Fachruddin, L. (2018). Kualitas Air Dan Kandungan Beberapa Logam di Danau Unhas. *Jurnal Pengelolaan Perairan*, 1(1), 1–13.

Jurnal Amal Pendidikan, 5(1) (2024): 7-14

Effectiveness of the Team Games Tournament Model Assisted by Photomath Interactive Learning Media

Yusro, M. (2023). *Peringkat Sistem Pendidikan Dunia 2023, Indonesia Ke 67 Dari 203 Negara*. Muhammad Yusro Web Page. <https://www.myusro.id/?p=1993>