

## The Effect of The TGT (Teams Games Tournament) Learning Model Assisted by Kahoot on Improving Students' Learning Outcomes

Lalu Salman Alparizi\*, Siti Nurhidayati

Biology Education, Faculty of Science, Engineering, and Applied Studies,  
Universitas Pendidikan Mandalika

\*Corresponding Author: [lalusalmanreal@gmail.com](mailto:lalusalmanreal@gmail.com)

**Abstract:** Students' low learning outcomes are partly attributable to efforts to improve instructional quality that have not yet been implemented optimally. A range of improvement strategies can be undertaken, including curriculum renewal, enhancement of the teaching–learning process, teacher professional development, provision of learning facilities, and refinement of assessment systems. This study aimed to analyze the effect of the cooperative learning model of the Teams Games Tournament (TGT) type assisted by Kahoot on students' learning outcomes. The study employed a quasi-experimental design with a pretest–posttest control group. The population comprised all Grade 10 students of SMA Negeri 1 Gerung. Two classes were selected using cluster random sampling: an experimental class ( $n = 30$ ) receiving TGT assisted by Kahoot and a control class ( $n = 30$ ) receiving conventional instruction. The research instrument was a 25-item multiple-choice learning-outcome test that had been examined for validity and reliability. Learning-outcome data were analyzed using ANCOVA to test differences in final achievement while controlling for initial scores. The results showed that the experimental class had a mean final score of 80.93, whereas the control class had a mean final score of 74.33. The ANCOVA yielded a significance value of 0.000 ( $p < 0.05$ ), indicating a statistically significant difference between the two groups. Therefore, it can be concluded that the TGT learning model, assisted by Kahoot, has a significant and effective impact on improving students' learning outcomes and has the potential to serve as an innovative and enjoyable instructional alternative in the classroom.

### Article History

Received: April, 2025

Revised: May, 2025

Published: June, 2025

### Key Words

TGT learning model; Kahoot;  
learning outcomes

**How to Cite:** Alparizi, L.S., & Nurhidayati, S. (2025). The Effect of The TGT (Teams Games Tournament) Learning Model Assisted by Kahoot on Improving Students' Learning Outcomes. *PAIDAGOGIA: Jurnal Inovasi Penelitian dan Pembelajaran*, 2(1). 41-50.

This is an open-access article under the [CC-BY-SA License](https://creativecommons.org/licenses/by-sa/4.0/).



### Introduction

Twenty-first-century learning is grounded in the principle that instruction should be student-centered, collaborative, contextual, and integrated with the community (Sonia et al., 2023). Learning is an integration of two activities: learning and teaching (Karlina, 2019). Education is essential for developing high-quality human resources, and therefore, it requires innovations that keep pace with advances in science and technology (Ismah & Ernawati, 2018). The low quality of education remains a key challenge in Indonesia. Instructional practices that still rely heavily on lecturing and teacher-centered approaches contribute to students' limited habituation in critical thinking, low classroom participation, and difficulties in solving problems that require higher-order reasoning (Sonia et al., 2023).

One issue frequently discussed in education is the quality of education and students' learning outcomes, as students are expected to develop disciplinary knowledge and generate new ideas. In many biology classrooms, instruction often emphasizes conceptual mastery, which can lead to passive learning and limited skill application. Biology learning is often conducted using conventional models such as lecturing and, in some contexts, Problem-Based Learning,

implemented in ways that may not optimally engage students; consequently, students may experience boredom, reduced participation, and insufficient development of collaborative behaviors. Many factors influence students' learning outcomes, including the instructional model used. An instructional model is needed to support active, interactive learning between students and teachers. To improve biology learning outcomes and foster optimal collaborative attitudes, cooperative learning is a relevant alternative.

Low student achievement may also be related to teachers' efforts to improve learning outcomes that have not yet met expectations. Numerous initiatives can be undertaken to improve educational quality, including curriculum renewal, improvement of teaching and learning processes, enhancement of teacher quality, provision of textbooks and instructional facilities, and refinement of assessment systems, among others (Ismah & Ernawati, 2018). Student learning outcomes are influenced by external factors (external to the student) and internal factors (internal to the student). External factors include family, school, and community environments. Internal factors include fatigue (physical and mental), physiological factors (health status and physical impairments), and psychological factors (intelligence, attention, interest, aptitude, motivation, maturity, skills, and readiness to learn). Other factors include motivation, learning interest, teacher–student interaction, students' critical thinking and problem-solving abilities, and the instructional model (Oktaviani et al., 2020).

An effort to enhance students' learning outcomes is to implement the TGT learning model assisted by Kahoot. The TGT model is a cooperative learning approach that requires members of each group to collaborate to achieve learning objectives (Zawawi et al., 2021). The TGT model generally involves four stages: teaching, group study, tournaments, and recognition/rewards. The use of learning media also supports the implementation of TGT. Online learning media, often referred to as e-learning or web-learning, have been increasingly adopted by various institutions. One web-based learning application is Kahoot. Kahoot is a free game-based learning platform accessible via the Kahoot website (e.g., kahoot.it) or the Kahoot smartphone app. Kahoot provides features such as games, discussions, surveys, and quizzes. The quiz feature can function as technology-enhanced media for TGT implementation. The quiz questions use a scoring system in which students who answer correctly more quickly receive higher scores (Stiadi, 2023).

The use of instructional media in teaching and learning can enhance students' interest, increase motivation, stimulate learning activities, and influence students' psychological engagement. Media-supported instruction can make learning more attractive and enjoyable, helping students understand the material more easily and supporting optimal learning outcomes. With TGT assisted by Kahoot, students may become more enthusiastic because the games and tournaments that characterize TGT encourage engagement throughout instruction. Students are motivated to demonstrate their competence and perform well. Moreover, the TGT model provides students with opportunities to learn in a more relaxed environment while fostering responsibility, teamwork, healthy competition, and engagement in learning. A strength of TGT is that it not only highlights high-achieving students; students with lower academic ability can also participate actively and play important roles in their groups. The model fosters togetherness and mutual respect among group members and increases students' enthusiasm, partly by offering recognition or rewards. Students also tend to enjoy the presence of games and tournaments (Saadjad, 2021).

To encourage students to make greater efforts, learning can be supported by online game-based media such as Kahoot. This learning medium can motivate students to be more enthusiastic. Kahoot can be used to capture students' attention and improve understanding during learning activities. Its use can help students achieve learning objectives by engaging in holistic learning experiences across psychomotor, affective, and cognitive domains (Fikri, 2024). Kahoot can enhance learning motivation through game features and music that attract students' interest,

thereby supporting improved learning outcomes. Research combining the TGT learning model and Kahoot remains relatively limited. Therefore, integrating TGT assisted by Kahoot is expected to improve students' learning outcomes.

## **Research Method**

### ***Research Design***

This study used a quantitative, quasi-experimental design employing a Pretest–Posttest Control Group Design (Darmawan, 2020). In this design, two groups are involved: an experimental class and a control class. Both groups received a pretest to measure baseline ability, then received different instructional treatments, and finally took a posttest to measure learning outcomes. Conceptually, the design is presented as follows: experimental class (P1–X1–O1) and control class (P2–X2–O2), where P1 and P2 denote the pretest, X1 denotes the treatment in the form of the cooperative Teams Games Tournament (TGT) model assisted by Kahoot, X2 denotes conventional instruction, and O1 and O2 denote the posttest learning outcomes (Table 1). This design was selected to enable comparisons of learning-outcome gains between groups while controlling for differences in students' initial abilities (Darmawan, 2020).

**Table 1.** Pretest–Posttest Control Group Design

Group	Pretest	Treatment	Posttest
Experimental	P1	X1	O1
Control	P2	X2	O2

### ***Population and Sample***

The study population comprised all Grade 10 students at SMA Negeri 1 Gerung. The sample was purposively selected based on class equivalence. Class X.H was designated as the experimental class (30 students) and received instruction using the TGT model assisted by Kahoot. In contrast, class X.I was designated as the control class (30 students) and received conventional instruction. Class matching was conducted by considering several aspects, including students' achievement in the relevant subject, the number of students per class, teachers' capability and commitment in instruction, time allocation and lesson schedules, and the equivalence of assessment instruments used (Aditiany et al., 2021). This matching was intended to minimize bias and ensure that any differences in learning outcomes more accurately reflected the effects of the instructional treatment.

### ***Research Instrument and Data Collection Procedure***

The primary instrument in this study was a 25-item multiple-choice learning-outcome test developed based on competency-achievement indicators for the taught material. The test instrument underwent validity and reliability testing before use and was therefore deemed appropriate as a measurement tool. The pretest was administered to both classes (experimental and control) before the instructional treatment to determine students' initial ability. The experimental class then engaged in cooperative learning using the TGT model, assisted by Kahoot, whereas the control class received conventional instruction as commonly practiced by the teacher. In the TGT-assisted-by-Kahoot condition, students learned in groups, participated in academic games and tournaments supported by the Kahoot platform, and received recognition based on group achievement. After the instructional sequence was completed, both classes were administered the posttest using the same instrument to measure final learning outcomes and to analyze differences in learning gains between the experimental and control classes.

## Result and Discussion

This study was conducted at SMA Negeri 1 Gerung with Grade 10 students in two classes: an experimental class and a control class. The primary objective was to analyze the effect of implementing the cooperative TGT (Teams Games Tournament) learning model assisted by Kahoot on students' learning outcomes compared with conventional instruction. Before administering the test instrument to both classes, a series of instrument-quality tests was conducted, including reliability testing and item validity testing using SPSS 25. The results of the reliability test are presented in Table 2.

**Table 2.** Reliability Statistics

Cronbach's Alpha	Number of Items
.910	25

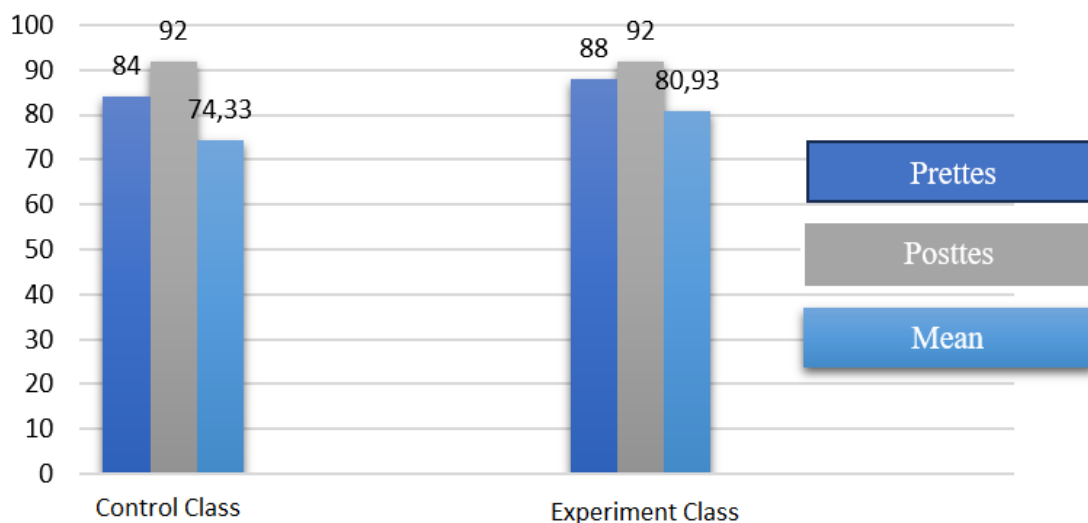
As shown in Table 2, the Cronbach's Alpha value of 0.910 for 25 items indicates that the test instrument has very high reliability. This value was compared with the r-table value of 0.324; because the computed coefficient exceeded the r-table, the instrument was considered reliable. Subsequently, item validity was examined using the Corrected Item–Total Correlation, which was also compared with the r-table = 0.324. Items with r-calculated > 0.324 were categorized as valid, whereas items with r-calculated ≤ 0.324 were categorized as invalid. The complete results of the item validity test are presented in Table 3.

**Table 3.** Instrument Item Validity Test Results

Item (n = 25)	r (calculated)	r (table) = 0.324	Decision
Item 1	.167	< 0.324	Invalid
Item 2	.356	> 0.324	Valid
Item 3	.515	> 0.324	Valid
Item 4	.782	> 0.324	Valid
Item 5	.735	> 0.324	Valid
Item 6	.149	< 0.324	Invalid
Item 7	.751	> 0.324	Valid
Item 8	.673	> 0.324	Valid
Item 9	.650	> 0.324	Valid
Item 10	.425	> 0.324	Valid
Item 11	.573	> 0.324	Valid
Item 12	.815	> 0.324	Valid
Item 13	.514	> 0.324	Valid
Item 14	.509	> 0.324	Valid
Item 15	.712	> 0.324	Valid
Item 16	.593	> 0.324	Valid
Item 17	.698	> 0.324	Valid
Item 18	.261	< 0.324	Invalid
Item 19	.487	> 0.324	Valid
Item 20	.810	> 0.324	Valid
Item 21	.515	> 0.324	Valid
Item 22	.515	> 0.324	Valid
Item 23	.782	> 0.324	Valid
Item 24	.301	< 0.324	Invalid
Item 25	.308	< 0.324	Invalid

Referring to Table 3, of the 25 multiple-choice items analyzed, 20 items were deemed valid because their correlation coefficients exceeded the r-table value (items 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, and 23). Meanwhile, five items (1, 6, 18, 24, and 25) had correlation coefficients below the r-table threshold and were classified as invalid. Nevertheless, all 25 items were retained for the test due to the limited time to construct and pilot new items. The researchers revised the wording of the five invalid items, particularly sentences considered confusing, to improve clarity and alignment with the measured indicators. This revision was intended to ensure the instrument continued to represent the full scope of the content in accordance with the prepared test blueprint.

After the instrument was considered suitable for use, it was administered to both classes as a pretest and a posttest. The pretest and posttest data were then described to depict the learning-outcome trends in each group. The mean pretest score for the experimental class was 62.40, and that for the control class was 66.00. The mean posttest score of the control class increased to 74.33, whereas the experimental class reached 80.93. The comparison of pretest and posttest results between the control and experimental classes is presented in Figure 1.



**Figure 1.** Pretest and Posttest Mean Scores for the Control and Experimental Classes

Figure 1 indicates that learning outcomes increased in both classes; however, the increase in the experimental class appears greater than that in the control class. To ensure that inferential analyses met statistical assumptions, prerequisite tests were conducted, including a normality test on pretest and posttest cognitive learning-outcome data in both groups. Normality was tested using the Shapiro–Wilk test, which is more sensitive for small sample sizes. The results are presented in Table 4.

**Table 4.** Normality Test Results (Kolmogorov–Smirnov and Shapiro–Wilk)

Dataset	K-S Statistic	K-S df	K-S Sig.	S-W Statistic	S-W df	S-W Sig.
Pretest (Control)	.187	30	.009	.921	30	.029
Posttest (Control)	.184	30	.011	.935	30	.068
Pretest (Exp.)	.130	30	.200*	.952	30	.191
Posttest (Exp.)	.124	30	.200*	.936	30	.072

Based on Table 4, the Shapiro–Wilk significance values (p-values) for the pretest and posttest data in both the experimental and control classes are above 0.05. Thus, the cognitive learning-outcome data for both instructional models are normally distributed. After the normality assumption was satisfied, a homogeneity-of-variance test was conducted to ensure that variances between groups were homogeneous. Homogeneity was tested using Levene's test, and the results are presented in Table 5.

**Table 5.** Homogeneity of Variances (Levene's Test)

Basis	Levene Statistic	df1	df2	Sig.
Based on Mean	1.045	14	101	.416
Based on Median	.483	14	101	.937
Based on Median (adjusted df)	.483	14	79.447	.936
Based on Trimmed Mean	1.042	14	101	.419

Table 5 shows that all Levene's test significance values—based on the mean, median, and trimmed mean—are above 0.05. This indicates that the variances of pretest and posttest learning outcomes between the experimental and control classes are homogeneous. After the assumptions of normality and homogeneity were met, hypothesis testing was conducted using Analysis of Covariance (ANCOVA), with posttest score as the dependent variable, pretest score as the covariate, and group (experimental vs. control) as the independent variable. The ANCOVA results are presented in Table 6.

**Table 6.** ANCOVA Results (Tests of Between-Subjects Effects; Dependent Variable: Posttest)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2607.245a	2	1303.622	36.484	.000
Intercept	6657.813	1	6657.813	186.330	.000
Pretest	1953.845	1	1953.845	54.681	.000
Group	969.143	1	969.143	27.123	.000
Error	2036.689	57	35.731		
Total	366260.000	60			

Based on Table 6, the significance value for the group factor is 0.000 ( $< 0.05$ ); therefore,  $H_0$  is rejected, and  $H_1$  is accepted. In other words, at the 95% confidence level, it can be concluded that the TGT learning model, assisted by Kahoot, has a statistically significant effect on students' learning outcomes after controlling for initial ability (pretest). In addition, the pretest covariate also significantly predicts the posttest score ( $p = 0.000$ ), indicating that baseline ability contributes to final achievement. To examine group mean differences in more detail, a Tukey HSD post-hoc test was performed, as shown in Table 7.

**Table 7.** Tukey HSD Post-hoc Test (Subset for alpha = 0.05)

Dataset	N	Mean
Pretest (Experimental)	30	62.40
Pretest (Control)	30	66.00
Posttest (Control)	30	74.33
Posttest (Experimental)	30	80.93

The Tukey HSD results in Table 7 show that the datasets are separated across subsets at the 0.05 significance level. The mean pretest scores of the experimental class (62.40) and control

class (66.00) are lower than the mean posttest scores of the control class (74.33) and, especially, the experimental class (80.93), which is the highest. This pattern indicates that although both groups improved, the improvement in the class taught using the TGT model, assisted by Kahoot, was larger and statistically significant than that in the class taught using conventional instruction. Accordingly, it can be affirmed that implementing TGT assisted by Kahoot is more effective for improving students' learning outcomes than conventional instruction.

### **Discussion**

Based on the results obtained from the control and experimental classes that received different instructional treatments—TGT (Teams Games Tournament) assisted by Kahoot in the experimental class and conventional instruction in the control class—empirical evidence indicates that the TGT model assisted by Kahoot has a statistically significant effect on students' learning outcomes. The ANCOVA hypothesis test produced a p-value of 0.000 at the 0.05 significance level, indicating that  $0.000 < 0.05$  and thus  $H_0$  is rejected. This finding suggests that after controlling for baseline ability (pretest), there is a meaningful difference in learning outcomes between students taught using TGT assisted by Kahoot and those taught using conventional instruction. Specifically, the experimental class mean posttest score was 80.93, higher than the control class mean of 74.33. Therefore, the TGT model, assisted by Kahoot, can be considered more effective at improving students' learning outcomes.

Theoretically, this finding aligns with social learning, behaviorist, and constructivist perspectives. As a cooperative learning approach, TGT emphasizes student collaboration, shared responsibility, and intensive social interaction through discussion and group problem-solving. This is consistent with social learning perspectives that highlight interaction as an important factor in developing knowledge and skills. In addition, integrating Kahoot as a game-based learning medium reinforces the form of scores, rankings, challenges, and rewards—features characteristic of behaviorist approaches—which can enhance motivation, engagement, and focus during learning. At the same time, students' active involvement in answering quizzes, discussing worksheets (LKPD), and jointly reflecting on answers illustrates constructivist principles, namely that knowledge is actively constructed through meaningful learning experiences and social interaction. Consequently, the combination of TGT and Kahoot offers a learning environment that is competitive yet collaborative, enjoyable, and meaningful—conditions reflected in the improved outcomes of the experimental class.

Empirically, this study's results are consistent with and strengthen prior evidence on the effectiveness of TGT assisted by Kahoot across various subjects and educational levels. Utari et al. (2018), Firmansyah et al. (2019), and Sugiata (2019) reported that TGT can improve teamwork, engagement, and learning outcomes, although in some cases student participation was not fully optimal and interactive digital media did not entirely support the learning process. More recent studies show similar patterns. Pello (2018) found that TGT assisted by Kahoot was effective for quadratic equations in senior high school, while Wulandari et al. (2024) and Siahaan et al. (2024) reported that TGT assisted by Kahoot significantly improved students' mathematical communication and critical thinking abilities. In social studies and integrated science and social studies (IPAS), Magfirah et al. (2023), Anjani et al. (2025), and Ramadhani and Setiawan (2025) reported that TGT assisted by Kahoot not only improved learning outcomes but also increased students' learning interest and engagement at primary and secondary levels. Similarly, Putri et al. (2025) demonstrated the effectiveness of a Kahoot-based TGT approach in improving learning outcomes on the human reproductive system, whereas Ristyanti and Widiyono (2024) and Alfaoji (2025) emphasized that integrating TGT and Kahoot significantly enhances students' learning motivation.

This study not only corroborates previous findings but also shows that combining TGT and Kahoot can help address challenges reported in earlier studies, such as limited participation and passive classroom climates. In this study, the experimental class exhibited a more interactive, dynamic, and enjoyable learning atmosphere than the control class, which tended to be more monotonous under conventional instruction. Students appeared more enthusiastic in participating in academic tournaments, engaging in group discussions, and competing healthily through Kahoot quizzes. These results support the argument that TGT assisted by Kahoot can improve not only cognitive learning outcomes but also motivation, interest, collaboration, and student engagement. Therefore, the TGT model, supported by Kahoot, can be recommended as an innovative instructional alternative aligned with the demands of 21st-century learning, particularly to improve learning quality and outcomes in schools.

### **Conclusion**

Based on the data analysis and discussion, it can be concluded that implementing the cooperative Teams Games Tournament (TGT) learning model, supported by Kahoot, has a statistically significant effect on improving students' learning outcomes compared with conventional instruction. This is reflected in the higher mean posttest score of the experimental class relative to the control class, as well as in the statistical test results, indicating a meaningful difference. The TGT model, supported by Kahoot, fosters a more interactive, collaborative, and enjoyable learning environment through the combination of group cooperation, academic tournaments, and technology-based games that provide immediate reinforcement in the form of scores and recognition. These conditions promote increased motivation, active participation, and cognitive engagement throughout the learning process, thereby positively affecting learning achievement. Accordingly, the TGT model, supported by Kahoot, is recommended as an innovative instructional alternative that aligns with 21st-century learning characteristics to enhance the quality of teaching processes and learning outcomes in schools.

### **Recommendation**

Based on the conclusion, it is recommended that the cooperative Teams Games Tournament (TGT) learning model supported by Kahoot be adopted as a sustainable instructional strategy in future lesson planning. Teachers are encouraged to systematically integrate the TGT–Kahoot model into their instructional designs by aligning it with students' characteristics and learning objectives, thereby creating more meaningful, collaborative, and engaging learning experiences. Furthermore, schools should support the implementation of technology-based interactive learning by providing adequate facilities and professional development for teachers to ensure effective use of this model. With careful planning and consistent implementation, the TGT model supported by Kahoot has strong potential to enhance students' motivation, active participation, and learning outcomes in the long term.

### **Acknowledgment**

The authors would like to express their sincere gratitude to the Grade 10 students of SMA Negeri 1 Gerung for their active participation, cooperation, and enthusiasm throughout the implementation of this study. Their willingness to engage in the learning activities and research process greatly contributed to the achievement of meaningful results. The authors also extend their deepest appreciation to the principal of SMA Negeri 1 Gerung for the support, encouragement, and permission granted to conduct this research. In addition, sincere thanks are addressed to the teachers for their guidance, assistance, and constructive suggestions, which were invaluable in facilitating the learning process and ensuring the successful completion of this study. Their collective support and collaboration played a crucial role in accomplishing this research.

## References

- Aditiany, V., & Pratiwi, R. T. (2021). Pengaruh media pembelajaran Macromedia Flash terhadap hasil belajar siswa (studi quasi eksperimen pada mata pelajaran IPS kelas VIII di SMP Negeri 3 Kuningan). *Equilibrium: Jurnal Penelitian Pendidikan dan Ekonomi*, 18(2), 102–109.
- Anjani, S., Rahmawati, S., Rohim, D. C., & Nugraha, Y. A. (2025). Efektivitas penggunaan model pembelajaran Teams Games Tournament berbantuan aplikasi Kahoot terhadap hasil belajar IPAS siswa kelas IV sekolah dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 10(3), 323–335.
- Darmawan, A. (2020). Pengaruh penggunaan Kahoot terhadap hasil belajar materi ruang lingkup biologi. *Eduteach: Jurnal Edukasi dan Teknologi Pembelajaran*, 1(2), 91–99.
- Firmansyah, M. I., Tantowi, Y. A., & Fawziah, G. R. (2019). Model Teams Games Tournament: Suatu analisis hasil implementasi dalam pembelajaran Pendidikan Agama Islam. *Tarbawy: Indonesian Journal of Islamic Education*, 6(2), 104–113.  
<https://doi.org/10.17509/t.v6i2.20583>
- Fikri, H. (2024). *Implementasi model pembelajaran kooperatif tipe TGT (Team Game Tournament) pada mata pelajaran Pendidikan Agama Islam dan Budi Pekerti di SMA Negeri 3 Bandar Lampung* (Doctoral dissertation, UIN Raden Intan Lampung).  
<http://repository.radenintan.ac.id>
- Ismah, Z., & Ernawati, T. (2018). Pengaruh model pembelajaran kooperatif tipe Teams Games Tournament (TGT) terhadap hasil belajar IPA siswa kelas VIII SMP ditinjau dari kerja sama siswa. *Jurnal Pijar MIPA*, 13(1), 82–85.
- Karlina, S. (2019). *Penggunaan aplikasi smartphone berbantu game Kahoot untuk meningkatkan hasil belajar biologi pada konsep jaringan hewan di SMA Pasundan Banjaran* (Doctoral dissertation, FKIP Universitas Pasundan).
- Magfirah, A. D., Sukardi, S., Wahidah, A., & Suryanti, N. M. N. (2023). Penerapan model Teams Games Tournament berbantuan Kahoot untuk meningkatkan hasil belajar sosiologi siswa. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 8(2), 1–23.
- Oktaviani, U., Kumawati, S., Apriliyani, M. N., Nugroho, H., & Susanti, E. (2020). Identifikasi faktor penyebab rendahnya hasil belajar matematika peserta didik di SMK Negeri 1 Tonjong. *Math Locus: Jurnal Riset dan Inovasi Pendidikan Matematika*, 1(1), 1–6.
- Pello, A. C. S. (2018). Keefektifan pembelajaran kooperatif tipe Teams Games Tournament (TGT) berbantuan media Kahoot untuk topik persamaan kuadrat pada siswa kelas X SMA IPH 2 Surabaya. *Buana Matematika: Jurnal Ilmiah Matematika dan Pendidikan Matematika*, 8(2), 89–100.
- Putri, K. A. (2023). Efektivitas media pembelajaran game Kahoot terhadap motivasi dan hasil belajar siswa. *Dinamika Sosial: Jurnal Pendidikan Ilmu Pengetahuan Sosial*, 2(3), 252–261.
- Ramadhani, H. C., & Setiawan, D. (2025). Efektivitas model pembelajaran kooperatif Teams Games Tournament (TGT) berbantuan media web Kahoot! mode tim untuk meningkatkan minat belajar IPAS kelas V SD. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 10(3), 444–478.
- Saadjad, D. Y. (2021). Pengaruh model pembelajaran TGT melalui daring terhadap hasil belajar siswa MTs Negeri 1 Luwuk. *Liner: Jurnal Ilmu Pendidikan*, 5(1), 63–72.
- Siahaan, Y. W., Murdiyanto, T., & Meidianingsih, Q. (2024). Pengaruh model pembelajaran kooperatif tipe Teams Games Tournament berbantuan Kahoot! terhadap kemampuan berpikir kritis matematis siswa SMA Negeri 27 Jakarta. *Jurnal Riset Pembelajaran Matematika Sekolah*, 8(2), 63–70.

- Sonia, T., Alberida, H., Arsih, F., & Selaras, G. H. (2023). Pengaruh model pembelajaran inkuiri terbimbing terhadap keterampilan berpikir kritis peserta didik pada pembelajaran biologi. *Bioilmi: Jurnal Pendidikan*, 9(1).
- Stiadi, E., & Lestary, R. (2023). Workshop penerapan model Team Games Tournament berbantuan aplikasi Kahoot bagi guru MGMP SMA Bengkulu. *Journal of Community Empowerment*, 1(2), 30–36.
- Sugiata, I. W. (2019). Penerapan model pembelajaran TGT untuk meningkatkan hasil belajar. *Jurnal Pendidikan Kimia Indonesia*, 2(2), 78. <https://doi.org/10.23887/jpk.v2i2.16618>
- Utari, F. D., Barlian, I., & Deskoni, D. (2018). Pengaruh model pembelajaran kooperatif tipe Teams Games Tournament terhadap hasil belajar siswa pada mata pelajaran ekonomi di SMA Muhammadiyah 2 Palembang. *Jurnal Profit: Kajian Pendidikan Ekonomi dan Ilmu Ekonomi*, 5(1), 40–49.
- Wulandari, A., Hendrastuti, Z. R., & Krisma, D. A. (2024). Pengaruh model pembelajaran Teams Games Tournament (TGT) berbantuan Kahoot terhadap kemampuan komunikasi matematis siswa. *Journal of Mathematics Education and Science*, 7(2), 155–165.
- Zawawi, A. Z. I., Susilaningtyas, T., & Irawati, T. N. (2021). Peningkatan aktivitas dan hasil belajar siswa melalui model TGT berbantuan Kahoot. *Jurnal Pendidikan, Pembelajaran, dan Bimbingan dan Konseling*, 9(1), 1–11.