

## IMPLEMENTATION OF TGT MODEL ASSISTED BY QUIZIZZ TO ENHANCE STUDENTS' MATHEMATICS LEARNING MOTIVATION

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### ABSTRACT

*Learning motivation is essential for students' academic success, especially in mathematics, a subject commonly considered difficult. Classroom practices that are still teacher-centered may limit students' participation and reduce interaction during learning activities. Therefore, an instructional strategy that encourages active involvement and creates a more engaging classroom atmosphere is needed. This study is intended to examine the improvement in students' learning motivation by implementing the TGT model assisted with the support of Quizizz. The research applied a quantitative approach with a descriptive method utilizing a pre-experimental One-Group Pretest-Posttest design. The participants were 25 students drawn from grade VII F at MTs Negeri 4 Surabaya, selected by means of a random sampling technique. The data were obtained using a learning motivation survey instrument administered before and after the treatment, as well as observation sheets to assess the implementation process and students' classroom activities. The findings reveal a rise in students' learning motivation from 75% in the pretest to 90% in the posttest, while the implementation of learning and student activities reached 87.50%, categorized as very good. The results demonstrate that the TGT approach supported by Quizizz can foster a more interactive learning environment and contribute to improving students' motivation within mathematics learning, especially in the topic of integers.*

**Keywords:** learning motivation; mathematics learning; quizizz; teams games tournament (TGT).

### ABSTRAK

Motivasi belajar memegang peranan penting dalam menunjang keberhasilan siswa, khususnya dalam pembelajaran matematika yang kerap dianggap sulit dan menantang. Kondisi pembelajaran yang masih berfokus pada guru cenderung menyebabkan keterlibatan siswa menjadi terbatas, sehingga interaksi dalam proses belajar belum berjalan secara optimal. Oleh sebab itu, dibutuhkan strategi pembelajaran yang mampu mengaktifkan peran siswa sekaligus menghadirkan suasana kelas yang lebih menarik. Penelitian ini bertujuan untuk menguraikan peningkatan motivasi belajar siswa melalui penerapan model TGT yang dipadukan dengan Quizizz. Penelitian ini menerapkan pendekatan kuantitatif dengan metode deskriptif serta menggunakan desain pra-eksperimental One-Group Pretest-Posttest. Subjek penelitian berjumlah 25 siswa kelas VII F MTs Negeri 4 Surabaya yang dipilih melalui teknik acak. Data dikumpulkan melalui angket motivasi belajar yang diberikan sebelum dan setelah pembelajaran berlangsung, serta lembar observasi yang digunakan untuk menilai keterlaksanaan pembelajaran dan aktivitas siswa selama proses berlangsung. Hasil penelitian memperlihatkan bahwa motivasi belajar siswa meningkat dari 75% pada kondisi awal menjadi 90% setelah penerapan model, sementara aktivitas siswa berada dalam kategori sangat baik. Temuan ini menunjukkan bahwa penggunaan model TGT berbantuan Quizizz dapat mendukung terciptanya pembelajaran yang lebih aktif dan interaktif, sehingga berdampak positif terhadap peningkatan motivasi belajar siswa pada materi bilangan bulat.

**Kata kunci:** matematika; motivasi belajar; quizizz; teams games tournament (TGT).



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## **Introduction**

Indonesian Ministry of Education and Culture Regulation No. 22 of 2016 emphasizes that the learning process should be designed to promote active student participation, enhance motivation and interest, create a positive learning environment, and provide meaningful challenges for learners. These principles are particularly important in mathematics learning, which often requires students to understand abstract concepts, memorize various formulas, and perform complex calculations (Lastia, 2020). Good motivation will provide a good understanding of learning in children (Linuhung et al., 2025). However, in practice, mathematics instruction is still frequently dominated by teacher-centered approaches, resulting in limited student involvement in classroom activities (Saufi & Rizka, 2021). Consequently, many students become passive, show low engagement, and experience a decline in motivation during the learning process.

Learning motivation refers to both internal and external factors that drive students to participate in learning activities (Agustin, Umardiyah, & Nasrulloh, 2024). Through motivation, students will be encouraged to learn and can influence the learning process (Komariya et al., 2018). It has a significant influence on students' academic achievement, since low motivation can inhibit the development of their abilities and negatively impact learning outcomes (Rohmah, Alfiandra, & Reni, 2025). Motivation is generally divided into intrinsic motivation, which comes from within the learner, and extrinsic motivation, which is shaped by external influences such as teaching strategies and the learning environment (Wijaya, 2023). Students who possess strong learning motivation usually demonstrate enthusiasm, persistence, and a willingness to face challenges, which ultimately supports optimal achievement (Oktafrizal, Puryati, & Sekarwinahyu, 2025). Therefore, motivation is a key element in achieving successful mathematics learning.

Despite its importance, several studies indicate that students' motivation in mathematics learning remains relatively low. A study conducted by Rizky and Zahari (2024) at MTs Sabilunnajah revealed that classroom instruction was still dominated by lecture-based teaching with minimal student participation. Consequently, only 16.7% of the 30 students achieved learning mastery, while the remaining 83.3% did not reach the required standard. Similarly, research by Syarifah et al. (2025), conducted in a junior high school in Tangerang, found that some students paid minimal attention to the teacher's explanations, preferred interacting with peers, were reluctant to complete assigned tasks, and rarely raised questions when they experienced difficulties in understanding the material. Another study by Hermainis et al. (2025) in class VIII of SMP Negeri 12 Padang also found that many students showed low engagement during lessons because teaching activities were still dominated by lecture methods. This situation often caused boredom and made students hesitant to ask questions when they encountered learning difficulties. In addition, preliminary observations conducted by the researcher in grade VII at MTsN 4 Surabaya revealed similar conditions. Some students appeared less active during classroom activities, frequently talked with their classmates while the teacher explained the material, and were still hesitant to ask questions when they did not understand the topic being discussed. These findings indicate that students' motivation in learning mathematics still needs improvement.

One effort that can be implemented to improve students' learning motivation is the use of an instructional model that actively engages students in classroom activities. One cooperative learning approach that can be implemented is the Teams Games Tournament (TGT) model. This model engages students in group-based academic games and

tournament activities without distinguishing them based on their ability levels (Astuti, Suryana, & Suaidi, 2022). Student learning outcomes increased after implementing the TGT Cooperative Learning model (Lestari et al., 2023). Throughout the learning activities, students take part in group discussions, educational games, and tournament sessions, which are often accompanied by rewards or recognition (Zahro, Kuryanto, & Riswari, 2024). Such learning experiences create a more enjoyable and interactive atmosphere, which can stimulate students to participate more actively in the lesson (Hamzah, 2021). Furthermore, the TGT model allows students to communicate, collaborate, and support each other in understanding the learning material. These interactions can strengthen students' confidence, increase their motivation, and foster a sense of responsibility for achieving group success (Asmara et al., 2021; Fauzi, Riswari, & Ermawati, 2023). The presence of game elements and positive competition during tournament activities can also motivate students to learn more actively and encourage them to contribute their best efforts to their teams.

Furthermore, the selection of appropriate instructional media also plays an important role in supporting students' learning motivation. The integration of technology-based learning media can enhance the effectiveness of the learning process. One digital platform that can be utilized is Quizizz, a game-based learning application that enables teachers to conduct quizzes, assessments, and interactive learning sessions (Fauziah, 2023.; Ningsih & Alfaqi, 2025). Quizizz offers various features such as interactive quizzes, scoring systems, leaderboards, and instant feedback, which help create a learning environment that is more interactive and fosters healthy competition (Irhad et al., 2023). Through these features, students can participate in learning activities in a more enjoyable way and are less likely to feel bored during the lesson. As a result, students' enthusiasm and participation in the learning process may increase.

Previous studies have demonstrated that both the TGT learning model and the Quizizz platform can positively influence students' learning motivation. Chairhany (2020) found that applying the TGT model improved students' motivation as well as their mathematics learning outcomes. Sugiharti et al. (2024) also reported that combining TGT with game-based learning media significantly enhanced students' motivation. Meanwhile, studies by Heriyanto et al. (2024) and Sudianto and Nurfazriyah (2025) indicated that Quizizz effectively increases student engagement and motivation in mathematics learning. However, most prior studies have examined TGT and Quizizz separately. Research that integrates the TGT cooperative learning model with Quizizz as a digital learning medium is still limited, particularly in mathematics learning on integer topics. This indicates a research gap that needs further investigation.

Considering these aspects, this study is intended to examine the enhancement of students' learning motivation through the application of the Teams Games Tournament (TGT) model integrated with Quizizz. It is expected that the results of this research will contribute to the development of more innovative teaching strategies and provide practical insights for improving students' motivation in mathematics learning.

## **Research Methods**

This research employed a quantitative framework with a descriptive procedure and adopted a pre-experimental scheme in the form of a One-Group Pretest–Posttest format. The design aimed to examine changes in students' learning motivation prior to and following the application of the instructional model. The research procedure was conducted in several stages. The procedure of the study was carried out in three main

phases. First, a pretest was administered to identify students' initial level of learning motivation. Second, the instructional activities were conducted through the Teams Games Tournament (TGT) approach supported by Quizizz. Finally, a final measurement was administered to measure students' learning motivation after the model had been applied.

The population included all seventh-grade students of MTs Negeri 4 Surabaya, which consisted of nine classes (VII A–VII I). One class, namely class VII F with a total of 25 students, was chosen as participants through a random sampling technique using a lottery method. In this procedure, the names of all classes were written on small pieces of paper, placed into a container, and one class was drawn randomly. This method ensured that each class had an equal opportunity to be selected as participants.

The data gathering process involved questionnaires and observations. The motivation questionnaire was administered twice, namely before the learning activities began and after the use of the TGT model supported by Quizizz, to examine changes in students' motivation. Meanwhile, observations were carried out during the learning activities to assess how the instructional process was implemented and how students participated throughout the lesson.

The instruments applied in this research consisted of a motivation questionnaire and an observation sheet. The questionnaire was developed based on several aspects of learning motivation, including the intention to achieve success, internal encouragement and learning needs, future goals, recognition in learning, engaging learning activities, and a supportive learning environment (Uno, 2016). These aspects were assessed using a four-level Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The observation sheet was designed to assess the implementation of instructional activities and student participation based on the stages of the TGT model. According to Slavin (as cited in Asba, 2019), the stages include class presentation, group discussion, game sessions, tournaments conducted through Quizizz related to integer material, and group recognition for the highest achievement. Prior to use, all research instruments were validated through expert judgment by two experienced mathematics teachers from MTs Negeri 4 Surabaya to ensure the relevance, clarity, and suitability of each item.

The obtained data were processed using descriptive statistical procedures with the assistance of SPSS version 26. The analysis included calculating the mean, percentage, and standard deviation. Questionnaire data were analyzed by determining the average scores and percentages for each motivation aspect to identify the level of students' learning motivation before and after the implementation. In addition, observation data were analyzed by calculating the percentage of instructional activities and student engagement during the process. The results obtained from the implementation of learning, student activities, and initial–final measurement scores were then classified into specific categories to provide a more understandable interpretation of the findings.

The categorization of percentage results related to instructional implementation and student activities followed interval criteria presented in Table 1. These criteria were used to classify the level of implementation and student participation, ranging from very poor to very good (Insani et al., 2022) in Table 1

Table 1. Categories of Learning Implementation and Student Activities

Interval	Category
76% - 85%	Very Good
60% - 75%	Good
55% - 59%	fair
<54%	Poor

Furthermore, Table 2 presents the interval categories used to determine students' levels of learning motivation based on the percentage scores obtained from the questionnaire. Based on these criteria, students' motivation is classified into very high, high, moderate, low, or very low levels (Wijaya, 2023) in Table 2.

Table 2. Interval Categories of Learning Motivation

Interval	Category
81% - 100%	Very High
61% - 80%	High
41% - 60%	Moderate
21% - 40%	Low
0% - 20%	Very Low

## Results and Discussion

To ensure that the research tools were appropriate for use, the validity aspects and reliability aspects were evaluated through expert judgment. Two experienced mathematics teachers from MTsN 4 Surabaya reviewed the learning motivation questionnaire and the observation sheets. Based on their evaluation, all items were considered appropriate, clearly constructed, and consistent with the indicators of learning motivation as well as the procedures of the TGT model supported by Quizizz. Consequently, the instruments were regarded as valid. In addition, reliability was ensured through agreement between the experts, who concluded that the questionnaire items were consistent in measuring students' responses, while the observation sheets accurately reflected both classroom activities and the stages of the TGT model. These results indicate that the instruments were feasible for collecting research data. Following the validation process, the instruments were used to gather data, including initial and final scores of students' learning motivation, observations of lesson implementation, as well as records of student activities during the use of the TGT approach combined with Quizizz on integer material. Learning Motivation Questionnaire Results are presented as in Table 3 below.

Table 3. Learning Motivation Questionnaire Results

No	Indicator	Pretest (%)	Category	Posttest (%)	Category	Increase (%)
1	Determination and desire to achieve success	73.5	High	93.75	Very High	27.55
2	Internal drive and need for continuous learning	73	High	90	Very High	23.29
3	Future goals and aspirations	75	High	92.75	Very High	23.67
4	Appreciation for learning activities	81.25	Very High	93.75	Very High	15.38
5	interesting learning activities	70.75	High	92.75	Very High	31.10
6	Supportive learning environment	77	High	94.75	Very High	23.05
	<b>Average</b>	75	High	90	Very High	24.01
	<b>Average</b>	3.50	.509	87.50		

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4	Appreciation for learning activities	81.25	Very High	93.75	Very High	15.38
5	interesting learning activities	70.75	High	92.75	Very High	31.10
6	Supportive learning environment	77	High	94.75	Very High	23.05
<b>Average</b>		75	High	90	Very High	24.01

Table 3 indicates that the mean score of students' learning motivation increased from 75% (High) before treatment to 90% (Very High) after treatment. All motivation indicators showed improvement. The most notable increase occurred in engaging learning activities, while the smallest gain was found in the appreciation indicator. These results indicate that the use of the TGT approach together with Quizizz contributed positively to improving students' motivation in learning mathematics.

The increase in motivation can be explained through the characteristics of the applied learning approach, in which the TGT model emphasizes teamwork, structured interaction, and competitive gameplay through tournament activities, while Quizizz incorporates gamification elements such as scoring systems, leaderboards, and immediate feedback that further enhance student engagement and motivation. During the tournament sessions, students actively answered questions, collaborated within their groups, and participated in healthy competition, resulting in an engaging and dynamic learning environment.

The implementation of the instructional process was also observed to ensure that each stage of the model was carried out properly. The observation results are shown in Table 4.

Table 4. Observation Results of Learning Implementation

	N	Mean	Std. Deviation	Percentage (%)
Observer 1	27	3.52	.509	87.96
Observer 2	27	3.48	.509	87.04
<b>Average</b>		3.50	.509	87.50

Data shown in Table 4 indicate that the mean score achieved 87.50%, which falls into the Very Good category. This indicates that all stages of the TGT model supported by Quizizz were conducted effectively, including material explanation, group

organization, tournament activities, and group recognition. A well-structured implementation contributed to a supportive learning environment and increased student involvement.

Student activities were also examined, and the findings are shown in Table 5.

Table 5. Observation Results of Student Activities

	N	Mean	Std. Deviation	Percentage (%)
Observer 1	33	3.45	.506	86.36
Observer 2	33	3.55	.506	88.64
<b>Average</b>		3.50	.506	87.50

Based on Table 5, student activity reached 87.50%, categorized as Very Good. Students were actively engaged in group discussions, solving problems, and participating in Quizizz-based tournaments. This indicates that the instructional process successfully encouraged active engagement among learners.

Overall, the results show that the integration of the TGT approach with Quizizz was effective in improving students' learning motivation. Improvements occurred across all indicators, supported by strong lesson implementation and high levels of student participation. One strength of this study lies in the consistent increase across motivation aspects as well as the alignment between instructional design and classroom practice. However, the smallest improvement was observed in the appreciation indicator, which may be influenced by limited variation in rewards or the possibility that students already felt sufficiently appreciated before the intervention.

These results are consistent with previous research reported by Alawiyah et al. (2023), where the TGT approach combined with game-based learning is able to improve students' motivation as well as interaction. In addition, Sari et al. (2022) in Sartika et al. (2025) reported that the use of Quizizz enhances students' enthusiasm and creates a more engaging learning environment. Oktafrizal et al. (2025) also highlighted that gamification features in Quizizz play an important role in improving learning motivation. Therefore, this study reinforces previous findings by providing empirical evidence in the context of seventh-grade mathematics learning, particularly on integer material.

In summary, combining the TGT approach with Quizizz successfully improved students' learning motivation from the High level to the Very High level. It also created a more interactive, engaging, and well-organized learning environment. These results provide practical implications for teachers in applying cooperative and technology-supported learning strategies to enhance students' motivation.

### Conclusion and Suggestion

The results of this research indicate that the implementation of the TGT model combined with Quizizz successfully improved students' motivation in learning mathematics, particularly in Class VII F at MTs Negeri 4 Surabaya. The improvement is reflected in the change of motivation levels, which increased from the high category before the intervention to the very high category after the learning process was carried out. These findings indicate that the integration of collaborative learning and game-based digital tools is able to create a more engaging and supportive learning environment, thereby positively contributing to students' motivation.

However, this research has several constraints. It was conducted in a single class and concentrated on a single mathematics topic, which may restrict the generalizability of the results. Therefore, further studies are suggested to involve a larger number of

participants, examine different learning materials, and be implemented in various educational contexts. Further studies may also explore the impact of this approach on students' learning achievement or investigate its long-term effects on learning motivation.

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