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Email : editorijhess@gmail.com

Rise of Champions (RoC): A Gamification Strategy to Foster Students' Interest in Learning Mathematics through Class-Based Competition

Samsul Bahari[1)], Ali Sadili [2)], Mohammad D. Sundawan[3)] Anggita Maharani[4)]*
[1,2,3,4)] Department of Mathematics Education, Faculty of Education and Sciences, Universitas Swadaya Gunung Jati, Indonesia

*Corresponding Author
Email: anggitamaharani@ugj.ac.id

Abstract
Low interest in learning mathematics among students remains a significant challenge in education. One approach that can be applied to enhance students' interest is gamification through class-based competition. This study aims to explore the impact of implementing the Rise of Champions (RoC) game on improving students' interest in learning mathematics. RoC is an educational game competition designed in four stages: Brain Arena, Memorizing, Equation Scramble, and Cryptarithm War. This study employed a descriptive qualitative method with 60 students from 20 different classes at SMAN 1 Lemahabang as participants. Data were collected through observation, Likert-scale questionnaires, and in-depth interviews. The findings show that RoC was effective in improving all four indicators of students' learning interest—enjoyment, curiosity, attention, and engagement—with an average score above 3.5. The fact that tenth-grade students emerged as champions also contributed to increasing motivation and competitive spirit among other students. In conclusion, RoC is proven to be an effective and enjoyable alternative learning medium to boost students' interest in mathematics through healthy and engaging competition.

Keywords: Clash of Champions, Gamification, Class Competition

INTRODUCTION

In the educational process, schools are not only institutions for delivering academic content (Indriyanti et al., 2024). They also serve as spaces that facilitate and support students in developing their full potential (Febriana et al., 2023; Indriyanti et al., 2024; Komalasari et al., 2024; Wijaya, 2020). However, in practice, most educational activities in schools still focus heavily on cognitive aspects and academic achievement alone (Albay & Pradana, 2025). This condition highlights the need for alternative learning spaces that can accommodate students' diverse potentials more holistically, beyond academic performance alone (Saputra et al., 2023).

Each student has unique talents and abilities—whether in the arts, creativity, or academics (Albay & Pradana, 2025; Indriyanti et al., 2024; Wijaya, 2020). One of the current challenges in education is how to create environments that support the balanced, meaningful, and enjoyable development of those potentials (Nurlaila et al., 2022). Extracurricular activities and school-organized competitions have proven to be effective platforms for channeling students' talents and cultivating healthy competitiveness (Wijaya, 2020). These activities can also serve as an attraction that increases students' interest in learning.

Learning interest is a form of internal drive or stimulus experienced by students (Ladiku et al., 2025; Warsito, 2019). This interest can rise or decline depending on internal and external factors (Ahmad et al., 2020; Nadrah, 2023). In other words, students' motivation and behavior in learning are greatly influenced by the extent of their interest. Students who are interested tend to enjoy the subject matter, feel excited to learn something new, and pay more attention to the material being studied (Anggraini et al., 2020; Sirait, 2016). Interest in learning reflects curiosity, engagement, and active involvement in the learning process (Arthur et al., 2022; Masni et al., 2021). These feelings usually begin with attention, followed by enjoyment and attraction toward the learning process itself (Arthur et al., 2022; Masni et al., 2021). there are four main

indicators to assess learning interest: (1) enjoyment, (2) curiosity, (3) attention, and (4) engagement (Aftriyati et al., 2019).

In mathematics learning, interest plays a crucial role in supporting student achievement (Hernama & Maharani, 2023). When students lack interest, they tend to ignore teacher explanations, which leads to poor academic performance (Roche et al., 2021). Many efforts have been made to increase learning interest, such as introducing various learning models, interactive media, and contextual strategies (Firmasari et al., 2024; Gufron et al., 2025; Rahman et al., 2025; Rahmi et al., 2025; Silviani et al., 2017). One promising and applicable method is the integration of gamification in education.

Gamification in education is a learning approach that incorporates game-based elements into the instructional process (Jusuf, 2016). This approach has shown great success in increasing student interest and motivation, particularly in mathematics (Febriani et al., 2023; Jusuf, 2016; Suparmini et al., 2024). It has also been proven to enhance the quality of learning by fostering emotional engagement (Suparmini et al., 2024). Some of the benefits of gamification include: (1) improving student participation in class, (2) creating a fun yet competitive atmosphere, and (3) encouraging collaboration in solving academic problems (Jusuf, 2016; Suparmini et al., 2024).

One form of implementing the gamification approach, as well as an effort to develop students' potential in a fun and meaningful way, can be seen through a program initiated by SMAN 1 Lemahabang (Permata & Kristanto, 2020; Rahmawati et al., 2025). SMAN 1 Lemahabang initiated an event titled *"Artventure 2025"*, an expressive and competitive program designed to explore and develop students' potential. One of the activities in the Artventure series is the mathematics competition *"Rise of Champions (RoC)"*, which was developed by the student council of SMAN 1 Lemahabang.

Rise of Champions (RoC) is an educational game-based medium in mathematics that combines elements of logic, spatial reasoning, and memory. The game was inspired by the educational show *Clash of Champions (CoC)*. RoC consists of four games: (1) Brain Arena, (2) Memorizing, (3) Equation Scramble, and (4) Cryptarithm War (Amri & Ardiyanti, 2025; Lestari & Darmawan, 2024; Sari & Reftantia, 2024). Its objectives are to provide opportunities for students to strengthen their mathematical abilities, to fill their free time with positive (educational) activities, and to increase their interest in learning mathematics (Rahmawati et al., 2025). RoC serves as a competition that invites all classes of SMAN 1 Lemahabang to participate by sending class representatives. The game is designed to be played in teams, thereby fostering both competitive spirit and collaboration among students.

RESEARCH METHODS

The research method employed in this study was descriptive qualitative. This approach was chosen as it is suitable for exploring in depth the process, student responses, and the impact of the RoC competition implementation (Fadli, 2021; Sundawan et al., 2019). The research subjects were class representatives from each of the 20 classes at SMAN 1 Lemahabang, with three students representing each class. In total, 60 students participated in the RoC competition.
The research instruments used in this study consisted of:

1. an activity observation sheet,
2. a Likert-scale student response questionnaire, and
3. in-depth interviews.

Data were analyzed thematically through several stages: (1) data reduction, (2) data presentation, and (3) drawing conclusions. The validity of the data was strengthened through triangulation by comparing the results of all three instruments.

RESULT AND DISCUSSION

Rise of Champions RoC

RoC is a competition organized by the student council (OSIS) of SMAN 1 Lemahabang. The main goal of RoC is to train students' logical thinking, understanding of mathematical concepts such as algebra, memory skills, and teamwork. This aligns with Ulhusna, (2020) who stated that the use of games in learning can enhance team collaboration. Furthermore, educational games can also sharpen logical reasoning and make concepts easier for students to grasp (Ningrum et al., 2024).

1. RoC Description

1.1.Brain Arena

Brain Arena is a game designed to sharpen students' critical thinking, speed, and accuracy through a series of questions covering various school subjects and general knowledge. The questions include topics from Mathematics, Indonesian Language, Natural Sciences (IPA), Social Sciences (IPS), English, as well as general insight such as history, geography, notable figures, and popular culture. Players are given questions with varying levels of difficulty. Each correct answer earns points, while incorrect answers do not yield points and may trigger additional challenges. This game is played in teams.

Figure1. Brain Arena Game

1.2.Memorizing

Memorizing is a game that sharpens students' memory skills, accuracy, and attention to detail. In this game, students are required to match pairs of cards featuring images of fruits and animals. Players take turns flipping two cards at a time. The cards are arranged randomly, and among them are trap cards known as "Zonk" cards. A Zonk card is a special card that has no matching pair and carries a unique challenge. When a player draws a Zonk, they must complete an additional task before continuing. This element adds excitement and difficulty, encouraging players to stay alert and focused throughout the game.

Figure2. Memorizing Game

1.3.Equation Scramble

This game combines basic numerical operations with logic-based challenges. Students are required to think quickly yet carefully in order to complete the game successfully. The main objective of this activity is to sharpen students' basic numeracy skills and problem-solving abilities by encouraging them to apply previously acquired knowledge in a dynamic setting.

In this game, students must create valid mathematical operations using the number and operator cards provided. The operations must be constructed strictly from the given cards. Each

valid equation formed earns points, with the score weighted based on the complexity and accuracy of the operation.

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Figure3. Equation Scramble Game

1.4.Cryptarithm War

This game is a combination of advanced algebra and basic arithmetic operations. Students are challenged to solve algebraic problems involving numerical operations with precise and accurate answers. The primary aim of this game is to train students' concentration, attention to detail, and their understanding of fundamental number operation systems.

Figure4.Cryptarithm War Game

2. RoC Competition Flow

2.1.Brain Arena Round

In the first stage of the competition, a total of 20 teams consisting of 60 students competed in the Brain Arena game. From this round, 16 winning teams were selected to advance to the second game, Memorizing.

Figure5. Brain Arena Round

2.2.Memorizing Round

In the second game, the 16 remaining teams are paired into 8 matchups to compete in Memorizing. Each team's score is ranked based on the total points earned during the game. The top 6 teams with the highest scores are declared the winners and advance to the third round: Equation Scramble.

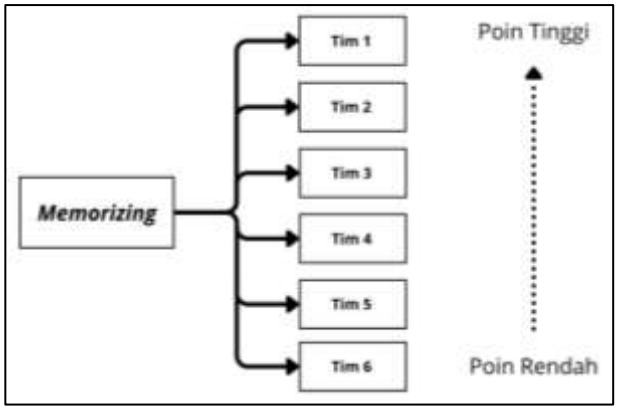

Figure6. Memorizing Round

2.3.Equation Scramble Round

In the third game, the 6 remaining teams are paired into 3 matchups to compete in Equation Scramble. Each team's total score is ranked from highest to lowest. The top 4 teams with the highest points are declared winners and move on to the fourth and final round: Cryptarithm War.

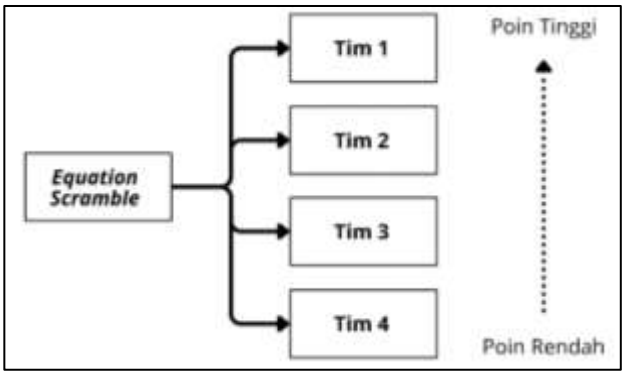

Figure7. Equation Scramble Round

2.4.Cryptarihtm War Round

In the fourth and final game, the 4 remaining teams are paired into 2 matchups. From this round, 3 teams are selected as the final winners, categorized as first place, second place, and third place.

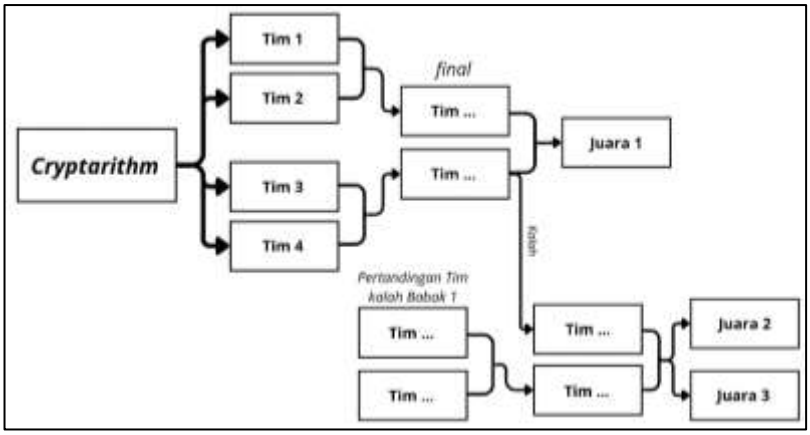

Figure8. Cryptarithm War Round

The basic rules are: working as a team, not interfering with or distracting other teams, and not using any gadgets during the competition.

Observation Results

The following are the observation results from the implementation of RoC for each game:

1. Brain Arena

During this game, students appeared enthusiastic while answering questions, although the atmosphere grew slightly tense from the middle to the end of the round. Players showed a high level of eagerness and were prepared to respond to questions presented by the student council (OSIS). Team members were actively engaged in discussion with one another. However, in some groups, a few participants were observed to be less active during the activity.

2. Memorizing

This game required more physical energy as players had to run toward the table to memorize card positions and match them with identical images or shapes. Despite the physical demand, players remained cheerful, and some were seen laughing after successfully completing the task. The key to this game was active communication and information-sharing among teammates. Students who had not yet played appeared curious and eager to try the game themselves.

3. Equation Scramble

In this round, students displayed serious expressions and concentrated intensely throughout the activity. They discussed strategies within their teams to solve the challenges both accurately and efficiently. Some students even prepared notes to plan out the possible operations and equations that could be formed. All team members were actively involved, taking on roles that matched their individual strengths and skills.

4. Cryptarithm War

This final game stood out from the previous rounds. Students appeared tense at the beginning, but once the activity was completed, they showed signs of satisfaction regardless of whether they won or lost. They were deeply involved in exchanging ideas and working through strategies to solve the given problems. Most teams prepared scratch paper to help calculate the possible values and number combinations related to the problems provided.

Student Questionnaire Results

Table.1 Average Scores of Student's Interest in Learning Mathematics

Indicator	Skor Rata-rata
Enjoyment	3,4
Curiosity	3,5
Attention	3,5
Engagement	3,6

The results of the learning interest questionnaire administered after the RoC competition indicate that students demonstrated a high level of interest in learning. This is reflected in all four indicators, each showing an average score above 3. The highest score was found in the Engagement indicator, with an average of 3.6. These results suggest that students were able to participate in the games with enjoyment and comfort throughout the activity.

Interview Results

1. Respondent 1

This respondent felt happy and challenged during the game. The activity helped improve their focus and increased their interest in mathematics. They reported being actively involved in their team and felt that learning through the game was more enjoyable than in regular classroom settings. The respondent expressed a willingness to participate again and suggested adding more logic-based questions and a practice session prior to the competition.

2. Respondent 2

Initially nervous, this respondent eventually found the game highly engaging and exciting. The competitive atmosphere helped them stay focused and made them more interested

in learning mathematics. They played an active role in their team and felt satisfied after making it into the top four. The respondent recommended allowing more time during the game.

3. Responden 3

his respondent felt happy and more confident. The game helped them concentrate and created a more enjoyable learning environment. Although they did not win, they felt proud of their participation and expressed interest in joining again. They recommended that the game include additional logic challenges or story-based math problems. This aligns with the findings of Putri et al. (2023), who state that self-confidence enables students to focus more on their tasks and become less affected by their surroundings.

Data Triangulation

To ensure the validity of the research findings, the researcher conducted data triangulation by comparing the results from three primary sources: observation, questionnaire, and interview. These instruments were used to comprehensively assess students' responses to the Rise of Champions (RoC) game, particularly in relation to the four indicators of learning interest: enjoyment, curiosity, attention, and engagement.

1. Enjoyment Indicator

Based on observation, students expressed visible signs of enjoyment during the game, especially in Brain Arena and Memorizing, such as laughing and smiling when they successfully answered or completed a challenge. This was supported by the questionnaire results, which showed an average score of 3.4 for the enjoyment indicator, and by interview responses stating that the game made students feel happy and challenged. All three instruments indicated that students experienced genuine enjoyment throughout the RoC activities. This finding is in line with Sinaga et al. (2023) who stated that the use of games in learning can enhance student interest, as students tend to feel more enthusiastic when solving problems presented as game-based challenges.

2. Curiosity Indicator

Observations revealed that students showed strong curiosity about the game content and displayed high enthusiasm while waiting for their turn to play. This finding aligned with the questionnaire results, which showed an average score of 3.5, and with interview responses in which students reported greater interest in mathematics after participating in the game. These three data sources indicate that RoC effectively increased students' curiosity toward mathematics. This supports the findings of Larasati et al. (2022), which reported that curiosity received the highest average score among all learning interest indicators. In other words, gamified learning can successfully spark students' inquisitiveness and desire to explore. (Larasati et al., 2022).

3. Attention Indicator

Students appeared focused and serious when planning strategies for games like Equation Scramble and Cryptarithm War, even going so far as to take personal notes to support their calculations. This was supported by questionnaire data, which recorded an average score of 3.5, and by interview responses, in which students admitted to being more focused during the competition than in regular classroom learning. This suggests that students' attention improved significantly through the competitive and interactive nature of the game. The finding is consistent with Paseleng & Arfiyani (2015), who noted that gamification increases students' attention to instructional explanations, thereby improving their understanding of the material.

4. Engagmenet Indicator

Observations documented that all team members actively participated during the gameplay. The questionnaire also showed that engagement received the highest average score—3.6—indicating strong student participation. Interview responses further reinforced this, with students stating that they contributed actively to problem-solving and teamwork. This confirms that RoC provided an optimal space for student engagement in the learning process. Similarly,

Larasati et al. (2022), found that games encourage students to interact and engage more actively in discussions with their peers.

Based on the triangulated data, it can be concluded that all three instruments—observation, questionnaire, and interview—yielded consistent and reinforcing results in showing that the implementation of the RoC game successfully enhanced students' interest in learning mathematics. This triangulation process strengthens the validity of the findings and ensures that the results accurately reflect students' actual experiences in the field. In other words, the use of educational games (gamification in learning) can foster and increase students' interest in mathematics (Larasati et al., 2022; Paseleng & Arfiyani, 2015; Sinaga et al., 2023).

Overall, the implementation of Rise of Champions (RoC) demonstrates that a gamification-based approach in the form of inter-class competition can create a fun, interactive, and engaging learning environment. Through the use of simple materials such as cards, number boards, and banners, students are able to learn mathematics in a more dynamic and practical context. The results from observation, questionnaire, and interview consistently show that this game nurtured students' learning interest through enjoyment, curiosity, focus, and active participation throughout the activities. The adjustment of difficulty levels according to grade level also ensured fair participation, allowing all students to enjoy a positive learning experience. Interestingly, the final result of the competition showed that tenth-grade students emerged as champions, which indirectly sparked motivation and competitive spirit among students in grades XI and XII. These findings confirm that RoC is not only effective as a learning medium, but also serves as a strategic tool for cultivating a culture of healthy competition and enhancing the quality of mathematics learning in schools.

CONCLUSION

Based on the results of observations, questionnaires, and interviews, it can be concluded that the implementation of the Rise of Champions (RoC) game in the form of an inter-class competition effectively increased students' interest in learning mathematics. This game was designed by combining elements of logic, collaboration, and strategy through four types of games: Brain Arena, Memorizing, Equation Scramble, and Cryptarithm War. The quantitative results of the questionnaire showed positive student responses on all four indicators of learning interest, with an average score of 3.4 for enjoyment, 3.5 for curiosity, 3.5 for attention, and 3.6 for engagement. These findings confirm that RoC is able to foster student motivation and active participation through a gamification approach. The use of simple media and adjustment of the difficulty level of questions according to grade level also ensured that all students could participate fairly and comfortably. The final result—with 10th-grade students emerging as champions—had a significant impact on increasing learning motivation while fostering a healthy competitive spirit, especially among 11th- and 12th-grade students. Thus, RoC can be considered as an effective alternative learning medium because it not only makes mathematics more fun, but also builds learning motivation and encourages students' active involvement as a whole.

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