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The influence of gamification-based learning media using Genially and Educaplay on elementary school students' interest in learning mathematics

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Abstract

Students master the basic concepts of mathematical operations, namely addition, subtraction, division, and multiplication, to help solve problems in everyday life. However, in practice, most students show a reluctance to participate in mathematics. This is in line with the opinion of Antoro et al. (2023), who stated that many students still view mathematics as a difficult, confusing, and even boring subject. This has resulted in a decline in student interest in mathematics. This study aims to determine the effect of gamification-based learning media using Genially and Educaplay on elementary school students' interest in mathematics in addition and subtraction of integers. The method used was a quasi-experimental design with a One Group Pretest–Posttest Design model. There were 28 students in this study. The research instrument was a learning interest questionnaire administered before and after the treatment. The Shapiro–Wilk normality test showed that the pretest data were normally distributed (Sig = 0.522), while the posttest data were not normally distributed (Sig = 0.000), so the analysis was continued using the Wilcoxon Signed Rank Test. The Wilcoxon test results showed a Z value of -4.624 and Asymp. Sig (2-tailed) = 0.000 (<0.05), indicating a significant difference between learning interest scores before and after treatment. The average score increased from 56.86 to 77.46, indicating a significant increase in learning interest after using gamification-based learning media using Genially and Educaplay. Thus, gamification-based learning media using Genially and Educaplay have been proven to have a significant effect on elementary school students' interest in learning mathematics.

Keywords: *gamification; Genially; Educaplay; learning interest.*

INTRODUCTION

Education is any effort undertaken by an educator to develop human knowledge and skills. Education is a means or bridge to help humans develop their potential through the learning process (Fadia & Fitri, 2021). Therefore, as an educator, one must not only provide knowledge and materials to students but also be responsible for their cognitive, emotional, and psychomotor development (Fatma & Ichsan, 2022). Mathematics is an integral part of the elementary school curriculum and plays a crucial role in enhancing students' conceptual understanding and thinking skills. Mathematics learning is a subject with abstract concepts that requires students to solve problems related to mathematics, which is an essential part of everyday life (Aprilia et al., 2022).

Seeing this, one of the responsibilities as a mathematics teacher is to ensure that the subject matter is given to students in accordance with curriculum standards and so that the learning process takes place with full and active student involvement (can take place in a fun way), teachers are challenged to think and act creatively to create a pleasant atmosphere during the learning process (Mailani, 2015). One of the important mathematical materials that is in accordance with curriculum standards is basic mathematical operations such as addition, subtraction, division and multiplication. The importance of the basic concepts of mathematical operations is mastered by students to help solve problems that exist in everyday life. However, conditions in the field, most students show a lack of enthusiasm and lack of interest in participating in learning, especially mathematics lessons. This can be seen from the majority of students showing an attitude

of unwillingness to follow mathematics subjects. This is in line with the opinion of Antoro et al. (2023) who stated that there are still many students who view mathematics as a difficult, confusing, and even boring subject. This has resulted in a decrease in student interest in mathematics lessons

Therefore, it is crucial to foster student interest in every subject, especially mathematics. Many students lack interest or enthusiasm for mathematics. If students lack interest, their mathematical abilities will decline and they will experience difficulties (Sirait, 2016). According to Jamaliyah & Wulandari (in Nur Isnaini, 2023), motivating learning media is crucial to foster student interest in learning mathematics. This impacts student learning interest. If students are not interested in learning, they will also be weaker in mathematics. The development of science and technology has had a significant impact on all aspects of human life (Ayu Puspitasari, 2022). These technological advances have also influenced various types of media as tools in the learning process.

As teachers, we are beginning to utilize technological advances to create innovative and engaging materials and learning media that are fun and easy for students to understand. By designing innovative, engaging, and easy-to-understand learning materials and media, it is hoped that classroom learning can run effectively and efficiently. Thus, student interest and enthusiasm for learning can increase. Therefore, teachers are required to be more professional, able to utilize existing multimedia or master easy applications to be able to create simple learning media before learning more complex applications, platforms, or websites to create learning media that suit the needs and characteristics of students as well as the characteristics of the material. These are the stages that are the basics of developing learning media (Meling et al., 2019). However, from the teacher's perspective, many teachers still do not use learning media in teaching, only using worksheets, textbooks, and whiteboards, so that students feel bored and uninterested in participating in learning, which reduces their interest in learning mathematics. This statement is reinforced by the statement of Gubbles, (2019), and Rahayu (2018) who stated that one of the factors that causes students to skip school is a problem factor in learning that causes students to be lazy and skip school.

Ideally, an educator should be able to design innovative and creative learning media to facilitate the delivery of material to students, ensuring its ease of understanding and engagement. Appropriate learning media can enhance interaction during the learning process, preventing student boredom (Hasan et al., 2021). The use of appropriate learning media is expected to increase student enthusiasm for learning. Teachers must remember that students' learning characteristics and abilities vary. By selecting appropriate learning media, teachers and students can have better interactions, and students will avoid boredom because media can optimize student interest and learning outcomes, resulting in positive outcomes (Faradila & Aimah, 2018).

Learning with gamification can add new color to the learning process, making it less monotonous (Nurjannah et al., 2021). Furthermore, gamification is a current learning trend that presents game elements such as points, badges, challenges, missions, and leaderboards in non-game contexts (Jun & Lucas, 2024). One innovative use of gamified learning media is Genially and Educaplay, which provide a variety of game formats that can be used. Research also shows that the use of Genially and Educaplay media can increase student learning interest (Putri, 2025). This statement is in accordance with the statements of Hellín et al., 2023; Li et al., 2024, which state that gamification has been shown to increase students' intrinsic motivation, create a competitive and healthy learning environment, and strengthen student engagement

Previous research states that the use of Genially and Educaplay media can increase students' interest in learning. (Jesan et al., 2024) stated that the use of Genially media can increase students' interest in learning with a high category of 80.2% in post-action

activities in the second cycle. (Ni'mah & Hermiati, 2022) stated that students' interest in learning increased by 17.94% by using Genially learning media. (Sry Annisa et al., 2025) stated that the use of Educaplay media can increase students' interest in learning mathematics with an average learning interest questionnaire score increasing from 55 (low category) before the action to 87 (very high category). (Wafiqni et al., 2025) stated that Educaplay is effective in increasing students' interest in learning overall with an average N-Gain value of 58.21 classified as a "moderate" increase category. (Putri, 2025) stated that the use of gamification learning media assisted by Genially and Educaplay was proven to be feasible, practical, and effective in increasing student learning interest with a feasibility percentage of 87.5% from material experts, 95.83% from media experts, and 100% from language experts. Meanwhile, practicality was 81.94% from class teachers and 94.8% from students. Media effectiveness was 87.41%.

What differentiates this study from previous studies is the use of Gamification, Genially, and Educaplay together to produce interactive and comprehensive learning media. In this study, learning media was created using the Genially platform to create engaging, easy-to-understand, and enjoyable materials, while the Educaplay platform was used to create fun and challenging quizzes, practice questions, and evaluations. Both were packaged in Gamification learning by incorporating game elements into the learning process so as to increase student learning interest in mathematics. This statement is in accordance with Collins' (1989) situational cognition theory, which states that authentic contexts created by technology can stimulate situational interest, thereby improving students' academic well-being and increasing their sense of comfort and engagement in the learning process (Li, X. & Chu, S. K. W., 2021). Thus, this study aims to examine the effect of gamification learning media assisted by Genially and Educaplay in increasing student learning interest in mathematics.

RESEARCH METHODS

This research employed a quantitative approach with a quasi-experimental design. The research design employed a One Group Pretest–Posttest Design, a design involving one group of subjects measured before and after treatment without a control group. The research consisted of three stages. The first stage was a pretest, measuring students' learning interest before treatment. The next stage was a treatment stage, implementing gamification-based learning media using Genially and Educaplay. Finally, the posttest measured students' learning interest after treatment. The study was conducted at an elementary school in Malang City with 28 students. The researchers chose this subject because second-grade students at this school demonstrated low learning interest in mathematics.

The research instrument used was a student learning interest questionnaire with a Likert scale (1–4) consisting of 20 items. Indicators of learning interest included: (1) attention to the lesson, (2) enjoyment in learning, (3) perseverance, and (4) active participation in learning activities. Data were analyzed quantitatively using the Wilcoxon Signed Rank Test because the data from the normality test (Shapiro–Wilk) showed a non-normal distribution. The Wilcoxon test was used to see the difference in pretest and posttest scores in the same group. Decisions were made based on the significance value (p). If the p value is less than 0.05, it can be concluded that there is a significant difference, so the null hypothesis (H_0) is rejected. Conversely, if the p value is equal to or greater than 0.05, there is no significant difference, so the null hypothesis (H_0) is accepted.

Table 1
Blueprint of the Learning Interest Questionnaire

No	Aspect	Indicator	Question Numbers	Number of Items
1.	Enjoyment	- Having a sense of enjoyment and liking the learning process; - Not feeling bored and being enthusiastic in participating in learning; - Having motivation and curiosity in participating in learningmengikuti pembelajaran	1, 2, 3, 4, 5	5
2.	Involvement	- Actively asking and answering questions from the teacher - Being disciplined in completing assignments; - Being active in both class discussions and group discussions - Participating seriously in learning	6, 7, 8, 9, 10	5
3.	Interest	- Being enthusiastic and interested in participating in learning; - Participating in learning without coercion and having a desire to continue learning	11, 12, 13, 14, 15	5
4.	Attention	- Paying attention to the explanation of the lesson material; - Concentrating during learning; - Taking notes on the lesson material	16, 17, 18, 19, 20	5

Source: (Annisa Syafrina Rizkyka Hamid et al., 2024) modified.

Second graders after implementing gamification-based learning media using Genially and Educaplay. Through this questionnaire, researchers sought to determine the extent to which the use of gamification-based learning media using Genially and Educaplay increased student interest, enthusiasm, and engagement in the learning process. This questionnaire served as a tool to assess the impact of implementing gamification-based learning media using Genially and Educaplay on students' enjoyment, motivation, and activeness during learning. This questionnaire consisted of 20 statements structured on a Likert scale with four response options: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). Through this scale, students could express their level of agreement with each question reflecting their learning interest. This instrument was developed based on four main aspects of learning interest: (1) enjoyment, (2) involvement, (3) interest, and (4) attention.

This learning interest questionnaire was designed to measure the level of learning interest of second-grade students after the implementation of gamification-based learning media using Genially and Educaplay. Through this questionnaire, researchers sought to determine the extent to which the use of gamification media can increase student interest, enthusiasm, and engagement in the learning process. This questionnaire serves as a tool to assess the effect of the implementation of this interactive media on students' enjoyment, motivation, and activeness during learning.

This questionnaire consists of 20 statements arranged using a Likert scale with four answer choices, namely: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). Through this scale, students can express their level of agreement with each question that reflects their interest in learning. This instrument was developed based on four main aspects of interest in learning, namely (1) feelings of pleasure, (2) involvement, (3) interest, and (4) attention.

The instrument was validated using small groups, and the gamification-based learning media, Genially and Educaplay, was also validated by experts, including media experts, content experts, and language experts. After valid results were obtained, it was used for larger groups, receiving gamification-based learning media treatments using Genially and Educaplay. The gamification-based learning media treatment using Genially and Educaplay was applied to larger groups using the TGT (Team Games Tournament) learning model, as it aligns with the characteristics of the learning media. The treatment steps were as follows:

1. In the first phase, the teacher explains the material on Genially using an LCD.
2. In the second phase, the teacher forms five groups with one student as the group leader.
3. In the third phase, the teacher prepares the Genially and Educaplay gamification media on the LCD, using a laptop and speakers to ensure clear audio. The teacher then explains the rules of the game to the students.

4. Phase 4: The teacher begins the game by calling each group one by one according to their number to play the game using the Genially and Educaplay gamification media on the LCD. The teacher monitors each group's activity as they work on the game questions. After all groups have completed the Genially and Educaplay games, the teacher writes the final scores for each group on the board and awards each group with star stickers based on their scores.
5. Phase 5: The tournament, where each group competes on a quiz using the Educaplay gamification media. The fastest and most correct group will receive the highest score. The group with the highest score is declared the winner.

RESULTS AND DISCUSSION

RESULTS

This study was conducted to determine the effect of using Gamification-based learning media using Genially and Educaplay on increasing learning interest in second-grade elementary school students on addition and subtraction of whole numbers. Data were obtained through a learning interest questionnaire administered before and after learning using Gamification-based learning media using Genially and Educaplay. The data were then analyzed through normality tests and Wilcoxon Signed Rank Tests using the SPSS program.

The results of the descriptive analysis showed an increase in the average score of students' learning interest after the implementation of Gamification-based learning media using Genially and Educaplay. Based on the questionnaire data, it was found that before the implementation of gamification media, the average score of students' learning interest was 56.86, categorized as "sufficient." The minimum score obtained by students was 45, while the maximum score was 69 with a standard deviation of 6.759. This illustrates that the level of students' learning interest before the treatment was still varied and tended to be moderate to low. After the implementation of gamification media, the average score of learning interest increased to 77.46, which is categorized as "high." The minimum score obtained was 70 and the maximum was 80, with a standard deviation of 3.037. With a smaller standard deviation value, it indicates that after the treatment, students' learning interest became more evenly distributed and relatively high among all respondents

Visually, this increase can be interpreted as indicating a surge in motivation and enthusiasm for learning. They demonstrated greater interest in mathematics learning activities, as evidenced by their active participation in answering questions, participating in games, and expressing joy during interactive quizzes. The gamification-based learning media developed using Genially and Educaplay has proven successful in creating a non-monotonous learning environment, transforming students' perceptions of mathematics as a difficult and boring subject into a fun and challenging activity.

Before conducting the hypothesis test, the data was first tested using the Shapiro–Wilk test to determine whether the data were normally distributed. The test results are presented in the following table:

Table 2
Tests of Normality

	Learning Interest	Shapiro-Wilk[a]	
		df	Sig.
Results of the Learning Interest Questionnaire	Learning Interest Questionnaire Before the Treatment	28	,522
	Learning Interest Questionnaire After the Treatment	28	,000

Based on these results, it can be seen that the pretest data has a normal distribution, while the posttest data is not normally distributed because the significance value is less than 0.05. Thus, the requirements for the parametric test (paired t-test) are not met. Therefore, the analysis was continued using a non-parametric test, namely the Wilcoxon Signed Rank Test, which is appropriate for paired data but not normally distributed

The Wilcoxon test was performed to determine whether there was a significant

difference between the results before and after treatment. The results of the SPSS analysis are shown in the following table:

Table 3
Ranks

		N	Mean Ranks	Sum of Ranks
Posttest Score − Pretest Score	Negative Ranks	0[a]	,00	,00
	Positive Ranks	28[b]	14,50	406,00
	Ties	0[c]		
	Total	28		

Table 4
Test Statistics

	Posttest Score − Pretest Score
Z	-4,624[b]
Asymp. Sig. (2-tailed)	,000

The table above shows that the positive ranks value = 28 indicates that all respondents experienced an increase in their learning interest scores after learning using Gamification-based learning media using Genially and Educaplay. Not a single student experienced a decrease in learning interest (Negative Ranks = 0). The Z value = -4.624 with Asymp. Sig (2-tailed) = 0.000 <0.05, indicating that there is a significant difference between the results before and after treatment. Thus, H_0 is rejected and H_1 is accepted, which means that Gamification-based learning media using Genially and Educaplay has a significant effect on increasing students' learning interest.

These results show that all students showed a positive upward trend. The average score increase of 20.6 points indicates that the gamification-based learning media using Genially and Educaplay has a strong appeal in stimulating learning interest. Interactive visualizations, attractive colors, and the presence of game elements such as scores and levels in the media help stimulate students' curiosity

Additionally, through game-based activities, students more easily grasp the concepts of addition and subtraction because they learn while playing. This approach aligns with 21st-century learning principles that emphasize active student engagement and the use of technology to strengthen conceptual understanding.

During the learning process, field observations revealed significant changes in student learning behavior. Before using gamification media, students tended to be passive, chatting with friends, and paying little attention to teacher explanations. However, after teachers implemented gamification-based learning media using Genially and Educaplay, the classroom atmosphere became more lively.

Students appeared enthusiastic about trying out the games presented on the screen. They eagerly completed each challenge, such as answering interactive questions, matching numbers, or solving counting puzzles. Their enthusiasm was also evident in the way they competed for the opportunity to play in front of the class. Some even asked to repeat the game, feeling challenged to achieve the highest score.

The class teacher also stated that this media helps explain abstract mathematical concepts more concretely. With engaging visuals and animations, students grasp the addition and subtraction process more quickly. The gamification-based learning media developed using Genially and Educaplay not only increases learning interest but also strengthens social engagement among students as they learn while collaborating and competing in a healthy manner.

DISCUSSION

The results of the study indicate that the implementation of Gamification-based learning media using Genially and Educaplay has a significant effect on increasing elementary school students' interest in learning. This is indicated by the results of the Wilcoxon Signed Rank Test with a Z value = - 4.624 and Asymp. Sig (2-tailed) = 0.000, which means there is a significant difference between the learning interest scores before and after the implementation of gamification media. This finding indicates that all students experienced an increase in learning interest, because the positive rating value reached 28 and no negative ratings were found, so it can

be concluded that the use of Gamification-based learning media using Genially and Educaplay had a positive impact overall on all respondents. This is in line with what Mao Jun and Terry Lucas (2024) said that gamification significantly increases student motivation, active participation, and academic success. Furthermore, Jun and Lucas said that the implementation of gamification has been proven to be able to bridge the imbalance in traditional pedagogical methods by introducing new ways to attract student interest and maintain long-term engagement. This is also supported by the research findings of Xiuhan Li and Samuel Kai Wah Chu (2021), which showed that deep student engagement in gamified e-learning platforms can help increase reading motivation and improve their reading skills. This effect can be maintained over several semesters. However, this is in contrast to the results of research conducted by Liuyufeng Li, Khe Foon Hew, and Jiahui Du (2024). Their findings indicate that it is possible to foster students' intrinsic motivation using gamified learning. These findings are further conveyed by Liuyufeng Li, Khe Foon Hew, and Jiahui Du. This view contributes to the literature in three ways. First, it explains the effectiveness of existing gamification interventions in fostering intrinsic motivation. Second, this reflection allows educators to better understand whether gamification supports students' basic psychological needs from a statistical perspective. Finally, this observation identifies several challenges associated with implementing gamification to foster intrinsic motivation and offers possible solutions to these challenges

Theoretically, the results of this study align with B.F. Skinner's (1953) view in behaviorist theory, which emphasizes the importance of reinforcement in motivating learning behavior. Gamification-based learning media using Genially and Educaplay provide positive reinforcement in the form of points, scores, or awards after students successfully answer questions or complete challenges. This creates feelings of pleasure and motivation to continue participating in learning activities. In addition, Keller's (1987) ARCS (Attention, Relevance, Confidence, Satisfaction) theory also supports these findings. According to this theory, learning motivation can increase if learning is able to attract attention (Attention), be relevant to students' needs (Relevance), increase self-confidence (Confidence), and provide satisfaction after learning (Satisfaction). These four elements are reflected in the Gamification-based learning media using Genially and Educaplay used in this study, where students gain attention through interactive visual displays, feel relevant to the game context, increase their self-confidence through the scores obtained, and feel satisfaction after successfully completing the game.

This finding aligns with the research findings of Allia, Oktaviani, and Wafa (2024), which stated that the use of Genially can increase student motivation and engagement in the learning process due to its engaging and interactive visualizations. A similar study by Batitusta and Hardinata (2024) also found that Educaplay can increase the active participation of elementary school students through fun and challenging game-based activities. By combining these two platforms, this study successfully created a more immersive and collaborative learning experience, where students are not only recipients of information but also active participants who are emotionally and cognitively involved in the learning process.

However, not all studies have yielded consistent results. Several other findings indicate potential drawbacks to the use of gamification media. According to Han and Johnson (2019), if the entertainment element in gamification media is too dominant without teacher supervision, students tend to focus more on the game aspect than on understanding the subject matter. This suggests that the success of gamification implementation depends heavily on the teacher's role in guiding and balancing the game element with learning objectives. Furthermore, the implementation of digital media such as Genially and Educaplay also faces challenges in terms of the availability of facilities and infrastructure. Not all schools

have adequate computers, projectors, or internet connections, especially in rural areas. Therefore, the effectiveness of gamification media is greatly influenced by the readiness of the infrastructure and the competence of teachers in operating learning technology.

Nevertheless, observations during the learning process showed that gamification media was able to transform the classroom atmosphere into a more active and conducive one. Students who previously tended to be passive became more courageous in participating, competing to answer questions, and showing enthusiastic expressions when playing quizzes or solving puzzles in the application. This strengthens the finding that gamification media not only increases learning interest quantitatively, but also qualitatively through changes in attitudes, motivation, and social interactions. Teachers also benefited from this media because it helped convey abstract material more concretely through engaging and easy-to-understand visualizations.

Based on these findings, this study has several implications and recommendations. First, for teachers, the use of Genially and Educaplay can be an effective alternative learning media to increase student interest and motivation, especially in mathematics, which is often considered difficult. Teachers need to receive training to be able to design gamification content that is appropriate to learning objectives and student characteristics. Second, for schools, it is recommended to support the development of educational technology infrastructure and provide opportunities for teachers to innovate in creating digital media. Third, for future researchers, it is recommended to use a research design that involves a control group to compare the effectiveness of gamification with conventional learning methods, as well as examine the long-term effects of gamification media use on student learning outcomes and intrinsic motivation.

Overall, the results of this study reinforce previous theories and findings that gamification is an effective approach to increasing elementary school students' learning interest. However, its effectiveness still depends on teachers' ability to manage learning so that game elements do not distract from the primary educational objectives. With proper supervision and learning design, the use of gamification media such as Genially and Educaplay can be an innovative solution for creating meaningful, enjoyable, and student-centered learning.

CONCLUSION

Based on the results of data analysis using the Wilcoxon Signed Rank Test, the Z value was obtained = -4.624 and Asymp. Sig (2-tailed) = 0.000 < 0.05, so it is concluded that there is a significant influence of the use of Gamification-based learning media using Genially and Educaplay on increasing the learning interest of second-grade elementary school students. This media is effective because it is able to create a fun, interactive, and motivating learning atmosphere. Thus, teachers are advised to utilize Gamification-based learning media using Genially and Educaplay in mathematics learning and other subjects to increase student interest and active participation. Further research is recommended to apply Gamification-based learning media using Genially and Educaplay in other subjects while using a control group to see whether the effect is stronger than mathematics.

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