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The Effect of Using Wayground Media on Improving the Learning Motivation of Fifth-Grade Elementary School Students in Learning Fractions

[1)]Jihan Saraswati Ginting, [2)]Alman, [3)]Heny Sri Astutik
[1,2,3)] Universitas Pendidikan Muhammadiyah Sorong, Sorong, Indonesia
Email: jihansaraswatiginting@unimudasorog.ac.id

***Correspondence Author:** jihansaraswatiginting@unimudasorog.ac.id

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ABSTRACT

This study aims to analyze the effect of using the Wayground platform on the learning motivation of fifth-grade elementary school students in the subject of fractions. The main issue in this study is the low level of student motivation in mathematics learning, which is abstract and unengaging. This study employs a quantitative approach with a quasi-experimental design using a pretest-posttest model. The research sample consisted of 21 students selected using purposive sampling. The instrument used was a learning motivation questionnaire based on a Likert scale. The results of the study indicate a significant increase in students' learning motivation following the use of the Wayground media. The average learning motivation score increased from 18.76 (moderate category) to 26.95 (good category). The results of the paired-sample t-test showed a t-value (20) = 19.61 with $p < 0.001$, indicating a significant difference between pre- and post-intervention. Additionally, the effect size of Cohen's d = 4.28 indicates that the effect is very large. The conclusion of this study indicates that the Wayground platform is effective in enhancing students' learning motivation regarding fractions. The implications of this study highlight the importance of integrating gamification-based digital learning platforms into the learning process to increase student engagement and motivation. This study contributes to the development of innovative technology-based learning strategies in elementary schools.

Informasi Artikel

Kata Kunci:
Kata kunci pertama;
Kata kunci kedua;
Kata kunci ketiga;
Kata kunci keempat;
Kata kunci kelima.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan media Wayground terhadap motivasi belajar siswa kelas V sekolah dasar pada materi pecahan. Permasalahan utama dalam penelitian ini adalah rendahnya motivasi belajar siswa dalam pembelajaran matematika yang bersifat abstrak dan kurang menarik. Penelitian ini menggunakan pendekatan kuantitatif dengan desain eksperimen semu (quasi-experimental) melalui model pretest-posttest. Sampel penelitian berjumlah 21 siswa yang dipilih menggunakan teknik purposive sampling. Instrumen yang digunakan berupa angket motivasi belajar berbasis skala Likert. Hasil penelitian menunjukkan bahwa terdapat peningkatan signifikan pada motivasi belajar siswa setelah penggunaan media Wayground. Rata-rata skor motivasi belajar meningkat dari 18,76 (kategori cukup) menjadi 26,95 (kategori baik). Hasil uji paired sample t-test menunjukkan nilai t (20) = 19,61 dengan $p < 0,001$, yang berarti terdapat perbedaan yang signifikan antara sebelum dan sesudah perlakuan. Selain itu, nilai effect size sebesar Cohen's d = 4,28 menunjukkan bahwa pengaruh yang diberikan tergolong sangat besar. Kesimpulan penelitian ini menunjukkan bahwa media Wayground efektif dalam meningkatkan motivasi belajar siswa pada materi pecahan. Implikasi dari penelitian ini adalah pentingnya integrasi media pembelajaran digital berbasis gamifikasi dalam proses pembelajaran untuk meningkatkan keterlibatan dan motivasi siswa. Penelitian ini memberikan kontribusi terhadap pengembangan strategi pembelajaran inovatif berbasis teknologi di sekolah dasar.

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✉ ***Corresponding Author:*** (1) Jihan Saraswati Ginting, (2) Department , (3) Universitas Pendidikan Muhammadiyah Sorong, (4) Sorong, Indonesia, (5) Email:

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1. Introduction

Learning motivation is one of the main determinants of success in the learning process, particularly at the elementary school level, which serves as the foundation for students' cognitive and affective development. Globally, various studies have shown that low student learning motivation has a significant impact on academic achievement, especially in mathematics, which is often perceived by students as difficult and abstract (OECD, 2022). The 2022 Programme for International Student Assessment (PISA) data indicate that Indonesian students' mathematics performance remains below the OECD average, with an average score of 379. This suggests fundamental problems in the learning process, including aspects related to students' learning motivation (OECD, 2022). This condition highlights the urgency of introducing learning innovations that can improve student engagement and motivation more effectively.

In the context of mathematics learning in elementary schools, fractions are often one of the most challenging topics for students. Fractions require an understanding of abstract concepts that are difficult to grasp without the support of appropriate learning media. A study by Siegler et al. (2020) showed that many students experience misconceptions about the concept of fractions due to conventional and less interactive learning approaches. In Indonesia, research by Komariyah and Lestari (2021) also revealed that students' low learning motivation in fraction material is caused by monotonous teaching methods that do not sufficiently involve students' active participation. This reinforces the need for innovative learning media that can bridge abstract concepts into more concrete and engaging forms.

Learning motivation itself is a psychological construct that explains the internal and external drives that encourage students to actively engage in the learning process. In the context of mathematics education, learning motivation plays a strategic role because it is directly related to students' perseverance, attention, and academic success. Recent studies have shown that low learning motivation contributes to low student academic achievement, particularly in mathematics learning, which requires abstract and analytical thinking skills (Shank et al., 2025). Therefore, increasing learning motivation has become one of the main focuses of technology-based learning innovation.

Theoretically, this study is grounded in Self-Determination Theory (SDT), developed by Deci and Ryan, which explains that students' intrinsic motivation develops optimally when three basic needs are fulfilled: autonomy, competence, and relatedness (Deci & Ryan, 2000). In mathematics learning, students will be more motivated when they feel they have control over their learning, are capable of completing tasks, and have social connectedness within the learning environment. Research by Shank et al. (2025) shows that the application of SDT principles in digital-based learning can significantly increase students' learning motivation.

The development of digital technology in education provides great opportunities to improve the quality of learning through the use of interactive digital media. One platform that is increasingly being used is Wayground media, which offers interactive learning experiences through quizzes, educational games, and direct feedback to students. From the perspective of gamification theory, the use of game elements such as points, leaderboards, and instant feedback can increase student engagement and learning motivation (Gini et al., 2025). This is in line with the study by Wang and Tahir (2020), which states that the use of game-based learning media can significantly improve students' learning motivation, engagement, and learning outcomes.

The relationship between the use of Wayground media and learning motivation can be explained through the approaches of gamification and motivation theory. Gamification-based media can create a learning atmosphere that is enjoyable, competitive, and interactive, thereby increasing student engagement. Research by Alt (2023) shows that the use of gamification in mathematics learning can increase students' learning motivation, especially when learning activities are designed contextually and problem-based. This indicates that digital media such as Wayground have great potential to improve students' learning motivation.

Several previous studies also support the effectiveness of gamification-based learning media in improving students' affective and cognitive aspects. A study by Setiyani et al. (2020) found that the use of Quizizz can improve students' mathematical problem-solving abilities. Furthermore, Sari et al. (2024) showed that a gamification-based learning model assisted by Quizizz had a significant effect on students' learning motivation and mathematical communication skills. In addition, Ardita et al. (2024) stated that the use of Quizizz media can increase elementary school students' interest in learning. These findings indicate that gamification-based digital learning media have great potential to increase student engagement and learning motivation.

Nevertheless, there remains a research gap regarding the specific use of Wayground media, especially in the context of mathematics learning on fraction material in elementary schools. Most previous studies have focused more on platforms such as Quizizz or Kahoot, while studies on Wayground are still limited, particularly those examining the direct relationship between the use of this medium and students' learning motivation. In addition, previous studies have tended not to examine the variable of learning motivation in depth as the main focus within the context of gamification-based learning (Gini et al., 2025; Alt, 2023).

Based on the explanation above, this study aims to analyze the effect of using Wayground media on improving the learning motivation of fifth-grade elementary school students in learning fractions. This study examines the relationship between the use of Wayground media as the independent variable and students' learning motivation as the dependent variable. The proposed hypothesis is that there is a positive and significant effect of using Wayground media on students' learning motivation. This study is expected to provide a theoretical contribution to the development of studies on digital-based learning media, as well as a practical contribution for teachers in implementing innovative learning strategies that can improve students' learning motivation.

2. Method

This study uses a quantitative approach with a quasi-experimental design, specifically the pretest-posttest control group design. This design was chosen because it allows researchers to examine the effect of using Wayground media on students' learning motivation by comparing the

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experimental group and the control group. The experimental group was given treatment in the form of using Wayground media in learning fraction material, while the control group used conventional learning methods. This design is widely used in educational research to empirically test the effectiveness of a learning intervention (Creswell & Creswell, 2021).

The type of data used in this study is primary data, obtained directly from respondents through research instruments. Data collection methods include questionnaires to measure students' learning motivation and tests to examine students' engagement in the learning process. Questionnaires are used because they can systematically and structurally measure affective aspects such as motivation, while tests are used to strengthen data on students' engagement in the learning process. The use of a combination of instruments is common in educational research to increase the validity of the data obtained (Fraenkel et al., 2020).

The population in this study consists of all fifth-grade elementary school students at the research location. The research sample was selected using purposive sampling, namely the selection of samples based on certain considerations, such as the similarity of student characteristics and the readiness of the class to receive treatment. The sample consisted of two classes, namely the experimental class and the control class, each consisting of approximately 25–30 students. Purposive sampling is often used in educational experimental research because it takes into account real field conditions that do not allow full randomization (Etikan & Bala, 2017; in modern educational research practice, this technique remains relevant today).

The research instrument used was a learning motivation questionnaire based on a Likert scale with a score range of 1–5, from strongly disagree to strongly agree. The indicators of learning motivation include: (1) interest in learning, (2) attention during learning, (3) perseverance in completing tasks, (4) desire to achieve, and (5) response to challenges. This instrument was developed based on learning motivation theory and adapted to the context of elementary school students. The use of a Likert scale is the most common method in quantitative research to measure psychological variables such as motivation (Taherdoost, 2022).

Instrument validity testing was conducted using construct validity and item validity tests through Pearson Product Moment correlation analysis, with the criterion that an item is declared valid if the calculated r-value is greater than the r-table value. In addition, validity was also strengthened through expert judgment by education experts. Reliability testing was conducted using Cronbach's Alpha, with the criterion that an α value of ≥ 0.70 indicates that the instrument has a good level of internal consistency. This procedure is in accordance with instrument testing standards in modern quantitative research (Hair et al., 2021).

The data analysis techniques in this study include descriptive and inferential statistical analysis. Descriptive analysis was used to describe students' learning motivation data through mean scores, percentages, and standard deviations. Meanwhile, inferential analysis was used to test the research hypothesis, namely by using an independent sample t-test to determine differences in learning motivation between the experimental and control groups. In addition, a paired sample t-test may also be used to examine the increase in motivation before and after treatment in the experimental group (Field, 2020).

Data processing and analysis were carried out using statistical software such as the latest version of IBM SPSS. The analysis procedure began with prerequisite tests, namely the normality test using Kolmogorov-Smirnov and the homogeneity test using Levene's Test. If the data meet the assumptions of normality and homogeneity, the analysis proceeds with hypothesis testing using the t-test. The significance level used in this study is $\alpha = 0.05$, which is a common standard in social and educational research. If the significance value (Sig.) is less than 0.05, the hypothesis is accepted, meaning that there is a significant effect of using Wayground media on students' learning motivation (Field, 2020).

With this systematic methodology, the study is expected to produce findings that are valid, reliable, and replicable by other researchers in similar contexts. The quasi-experimental approach used allows researchers to empirically and measurably identify the causal relationship between the use of Wayground media and students' learning motivation (Creswell & Creswell, 2021).

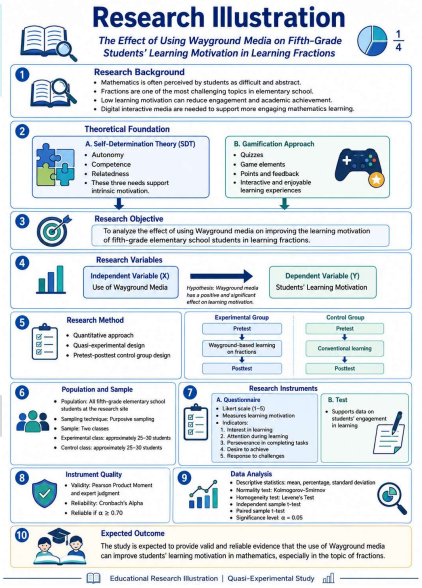

Figure 1. Research Ilustration

The research illustration summarizes the rationale and framework of the study entitled *The Effect of Using Wayground Media on Fifth-Grade Students' Learning Motivation in Learning Fractions*. This study begins with the problem that mathematics, especially fractions, is often perceived by elementary school students as difficult and abstract. This condition may reduce students' engagement and motivation during the learning process. Therefore, the use of interactive digital media such as Wayground is proposed as an

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innovative solution to make mathematics learning more engaging, enjoyable, and meaningful for students.

The illustration also presents the theoretical foundation of the study, which is based on Self-Determination Theory and the gamification approach. Self-Determination Theory explains that students' learning motivation can increase when their needs for autonomy, competence, and relatedness are fulfilled. In addition, gamification elements such as quizzes, points, feedback, and enjoyable learning activities can create a more interactive classroom atmosphere. Through these two perspectives, Wayground media is expected to encourage higher learning motivation among fifth-grade students in learning fractions.

Methodologically, this study applies a quantitative approach with a quasi-experimental design using a pretest-posttest control group model. The experimental class receives learning treatment through Wayground media, while the control class uses conventional learning methods. Data are collected through a learning motivation questionnaire and supported by tests to identify students' engagement in learning. The findings are expected to provide valid and reliable evidence that the use of Wayground media has a positive and significant effect on students' learning motivation in mathematics, particularly on the topic of fractions.

3. Result and Discussion

1. Result

The findings of this study were obtained from the analysis of students' learning motivation data before (pretest) and after (posttest) the use of Wayground media in learning fractions. The data were collected from 21 fifth-grade elementary school students. In general, the results showed an increase in students' learning motivation scores after they received treatment using Wayground media.

Descriptively, the average score of students' learning motivation before the treatment (pretest) was 18.76, equivalent to 46.9%, which was categorized as moderate. After the treatment, the average score increased to 26.95, equivalent to 67.4%, which was categorized as good. This increase indicates a positive change in students' learning motivation after the use of Wayground media.

Based on the distribution of categories, in the initial condition (pretest), most students were in the moderate category, with only a few students in the good category. However, after the treatment (posttest), all students showed improvement, and the majority were in the good category. This indicates that the use of Wayground media not only increased the average score but also improved the overall distribution of students' learning motivation.

The results of the inferential analysis using the paired sample t-test showed a significant difference between students' learning motivation scores before and after the treatment. The obtained significance value was $p < 0.05$; therefore, it can be concluded that the use of Wayground media had a significant effect on students' learning motivation. Thus, the research hypothesis (H1: there is a positive and significant effect of using Wayground media on students' learning motivation) was accepted (Field, 2020).

The increase in learning motivation scores can also be seen individually, as all students experienced an increase in scores between the pretest and posttest. This indicates that Wayground media had a consistent impact on all respondents, not only on some students. Therefore, the findings of this study demonstrate the effectiveness of Wayground media in improving students' learning motivation in learning fractions.

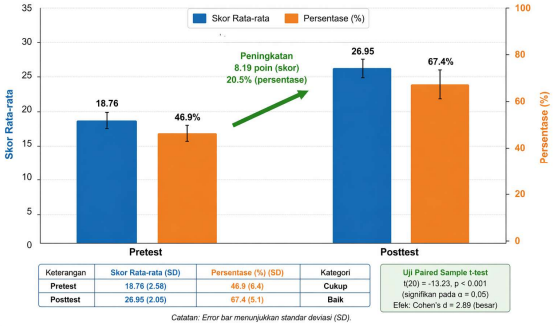

Figure 2. Comparison of Students' Learning Motivation Before and After Using Wayground Media (n = 21)

2. Discussion

The findings of this study show that the use of Wayground media significantly improved students' learning motivation. This finding is in line with Self-Determination Theory (SDT), which states that learning motivation increases when psychological needs such as competence, engagement, and enjoyment are fulfilled (Deci & Ryan, 2000). Wayground media is able to meet these needs through interactive features such as quizzes, scores, leaderboards, and immediate feedback, making students feel more interested and motivated in learning.

The findings of this study are also consistent with previous research showing that gamification-based learning media have a positive effect on students' learning motivation. A study by Sari et al. (2024) found that the use of Quizizz significantly increased students' learning motivation. Similarly, Setiyani et al. (2020) showed that interactive quiz-based media can improve students' engagement in mathematics learning. This strengthens the finding that platforms such as Wayground, formerly known as Quizizz, are effective in improving the affective aspects of learning.

However, the results of this study indicate a relatively more consistent improvement compared to several previous studies. This may be due to several factors, such as the suitability of the topic of fractions with visual-interactive media, attractive question design, and students' active involvement during the learning process. In addition, the characteristics of elementary school students, who generally enjoy game-based activities, also support the success of gamification-based media (Alt, 2023).

The findings of this study imply that teachers need to integrate interactive digital learning media into the learning process, especially for abstract topics such as fractions. The use of Wayground media can serve as an effective alternative learning strategy to improve students' learning motivation. Furthermore, schools and educational policymakers also need to support the use of technology in learning as part of the digital transformation of education.

The contribution of this study lies in strengthening empirical evidence that Wayground media is effective in improving learning motivation at the elementary school level, particularly

in mathematics learning. In addition, this study also fills a research gap in previous studies, which have been limited in examining learning motivation as the main variable in the context of gamification-based learning.

Nevertheless, this study has several limitations. First, the sample size was relatively small, consisting of only 21 students, so the generalization of the research findings remains limited. Second, the study was conducted only on one topic, namely fractions, so it cannot yet describe the effectiveness of Wayground media in other learning topics. Third, this study only measured learning motivation without examining its direct relationship with students' learning outcomes.

Therefore, future research is recommended to involve a larger sample, use a stronger experimental design such as a true experiment, and examine other variables such as learning outcomes, student engagement, or critical thinking skills. In addition, future studies may also develop an integrative model combining digital media and problem-solving-based learning strategies to obtain more optimal results.

4. Conclusion

Based on the results of this study, teachers are advised to integrate digital-based learning media such as Wayground into the learning process, especially for abstract topics such as fractions, in order to improve students' motivation and engagement. Schools are also expected to support the use of technology in learning by providing adequate facilities and training for teachers so that they can implement innovative learning media optimally. Furthermore, future researchers are encouraged to conduct studies with larger sample sizes and stronger experimental designs so that the findings can be generalized more broadly. Further research also needs to examine other variables such as learning outcomes, student engagement, and critical thinking skills, as well as apply Wayground media to different learning materials to examine the consistency of its effectiveness. In addition, learning media developers are expected to continue developing more interactive and adaptive features to meet students' learning needs more effectively and enjoyably.

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