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Systematic Literature Review on the Effectiveness of Wayground Interactive Learning Media in Mathematics Learning

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Abstract

The development of information technology has encouraged the adoption of interactive digital learning media to overcome the challenges of abstract mathematics learning and make it more concrete. This study aims to analyze the effectiveness of the Wayground platform (formerly Quizizz) as an interactive presentation medium in improving mathematics learning at the junior high school level. The research method used is a Systematic Literature Review (SLR) with the PRISMA model on 12 selected articles from 2021 to 2025. The articles discuss the effectiveness of learning media, particularly interactive or technology-based media, in the context of mathematics learning. The specific types of media include relevant interactive learning media, whether directly mentioning "Wayground" or similar types of interactive media aimed at improving mathematical concept understanding. The research design includes empirical studies such as development research, experiments, and classroom action research (CAR) that focus on learning outcomes and qualitative studies that discuss in depth the effectiveness of interactive learning media. The synthesis results show that, (1) Wayground features such as digital quizzes, flashcards, interactive discussions, real-time evaluations, and Paper Mode significantly support the creation of interactive and easily managed learning, (2) The application of Wayground has been proven to increase student motivation, engagement, active participation, and conceptual understanding in mathematics learning, (3) Interactive learning media such as Wayground effectively bridges the abstract nature of mathematics through visual and concrete presentation of concepts and enjoyable learning experiences, thereby improving learning outcomes. The implications of this study recommend the integration of Wayground into lesson planning and teacher training to optimize its features in order to create more effective and adaptive mathematics learning.

Keywords: Wayground; Interactive Presentation; Mathematics Learning

Abstrak

Perkembangan teknologi informasi telah mendorong adopsi media pembelajaran digital interaktif untuk mengatasi tantangan pembelajaran matematika yang bersifat abstrak menjadi konkret. Penelitian ini bertujuan untuk menganalisis efektivitas platform Wayground (sebelumnya Quizizz) sebagai media presentasi interaktif dalam meningkatkan pembelajaran matematika di jenjang SMP. Metode penelitian yang digunakan adalah Systematic Literature Review (SLR) dengan model PRISMA terhadap 12 artikel terpilih dari rentang tahun 2021-2025. Artikel membahas tentang efektivitas penggunaan media pembelajaran, khususnya yang interaktif atau berbasis teknologi, dalam konteks pembelajaran matematika, jenis media secara spesifik mencakup media pembelajaran interaktif yang relevan, baik itu secara langsung menyebut "Wayground" atau jenis media interaktif sejenis yang bertujuan untuk meningkatkan pemahaman konsep matematika. Desain Penelitian meliputi studi empiris seperti penelitian pengembangan, eksperimen, dan penelitian tindakan kelas (PTK) yang berfokus pada

hasil belajar dan studi kualitatif yang membahas secara mendalam efektivitas media pembelajaran interaktif. Hasil sintesis menunjukkan bahwa, (1) Fitur-fitur Wayground seperti kuis digital, flashcard, diskusi interaktif, evaluasi real-time, dan Paper Mode secara signifikan mendukung terciptanya pembelajaran yang interaktif dan mudah dikelola, (2) Penerapan Wayground terbukti meningkatkan motivasi, keterlibatan (engagement), partisipasi aktif, dan pemahaman konseptual siswa dalam pembelajaran matematika; (3) Media pembelajaran interaktif seperti Wayground efektif menjembatani sifat abstrak matematika melalui penyajian konsep secara visual, konkret, dan pengalaman belajar yang menyenangkan, sehingga berdampak pada peningkatan hasil belajar. Implikasi penelitian ini merekomendasikan integrasi Wayground ke dalam perencanaan pembelajaran dan pelatihan guru untuk memanfaatkan fiturnya secara optimal guna menciptakan pembelajaran matematika yang lebih efektif dan adaptif.

Kata Kunci: Wayground; Presentasi Interaktif; Pembelajaran Matematika

Introduction

The development of information and communication technology (ICT) has transformed the learning paradigm from conventional to interactive digital. The integration of digital media has become a crucial strategy to focus attention, foster interest, and increase student activity in the learning process (Saputra et al., 2024; Ardiansyah, 2022). Especially in mathematics learning, which is often considered abstract and difficult, interactive learning media plays an important role in bridging abstract concepts with real experiences, as well as accommodating various learning styles (Limbong et al., 2022).

Effective digital interaction-supported learning must be able to combine text, images, animations, and sound to create an enjoyable and effective learning experience (Siswanto, 2021). One platform that meets these criteria and shows great potential in increasing student engagement is Wayground, formerly known as Quizizz. Quizizz has gained popularity due to its interactive features such as live games, assignments, and comprehensive learning outcome reporting, making it an adaptive learning reflection tool (Heriyanto, 2024; Albab, 2025).

As it has developed, Wayground has transformed into a more comprehensive learning platform. The platform now supports a holistic learning process, not only through quizzes and various game modes, but also offers interactive presentations, reading materials, flashcards, videos, and AI-based content creation features (Dorssom, 2025). Wayground's interactive presentations provide visual displays and interactive simulations that are highly effective in helping students understand the relationships between mathematical concepts and develop problem-solving and critical thinking skills (Narawati, 2025).

These various interactive features are claimed to be able to increase active participation and improve learning motivation Asafila et al., (2025) and evaluate the learning process in real time (Ahmad, 2025). Previous studies have shown that this application is effective, interesting, fun, and easy to use from the students' point of view (Ridwan et al., 2024). Although Wayground has been recognized for its excellence in creating innovative and interactive learning processes Anofa (2023) previous research on interactive media in mathematics has tended to be dominated by other applications such as GeoGebra and PowerPoint (Azmi, 2024).

A crucial research gap is that there have not been many empirical studies that explicitly test and synthesize the effectiveness of the Wayground platform, especially its interactive presentation features, in the context of mathematics learning at the junior high

school level, which is an important phase in the development of students' logical and analytical thinking skills. Studies on the effectiveness of Wayground specifically in improving conceptual understanding and critical thinking skills still need to be strengthened (Ahmad et al., 2025). Based on these gaps, this study was conducted in the form of a Systematic Literature Review (SLR). The SLR method was chosen as the rational basis for conducting a critical synthesis of 12 selected articles published between 2021 and 2025. The aim is to systematically identify, evaluate, and synthesize empirical findings regarding the effectiveness of Wayground interactive learning media in mathematics learning. The research questions that guide this study include:

RQ1: What are the features of Wayground that support interactive learning in the context of mathematics learning? RQ2: How does the application of Wayground interactive learning media affect student motivation and engagement in junior high school mathematics learning? RQ3: How do the findings from various empirical studies synthesize the effectiveness of Wayground interactive learning media in overcoming the challenges of abstract mathematics learning at the junior high school level?

RQ1: What are the features of Wayground that support interactive learning?

RQ2: How does the application of Wayground interactive learning media affect student motivation and engagement in junior high school mathematics learning?

RQ3: How do findings from various empirical studies synthesize the effectiveness of interactive learning media in overcoming the challenges of abstract mathematics learning at the junior high school level?

Method

This study uses a Systematic Literature Review (SLR) approach with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model. The purpose of this study is to systematically review research results discussing the use of interactive presentations in mathematics learning. Literature identification was conducted using Google Scholar, Scopus, Sinta, Garuda, and others using the Publish or Perish (PoP) application with the keywords "Interactive Presentation," "Wayground," "Quizizz," and "Digital Application Education." The inclusion criteria included articles published between 2021 and 2025 that discussed the effectiveness of using learning media, especially interactive or technology-based media, in the context of mathematics learning. The specific types of media included interactive learning media that were relevant, either directly mentioning "Wayground" or similar types of interactive media aimed at improving understanding of mathematical concepts. The research design included empirical studies ( ) such as experimental research, development research, classroom action research (CAR) focusing on learning outcomes, and qualitative studies that discussed the effectiveness of media in depth. Exclusion criteria included articles that were not relevant to the topic discussed, were not interactive learning media, were duplicated or incomplete, and were published outside the specified time frame. The initial identification stage found 220 articles from various sources. Next, the researchers checked and found duplicate articles, leaving 50 articles. Of the 50 articles that were relevant to the topic discussed, 25 were suitable. Of the 25 articles that were suitable for the research objectives, 20 articles were suitable. The next stage was eligibility assessment, which yielded 12 relevant articles that met the inclusion criteria, namely discussing interactive presentations in learning, being effective in mathematics learning, and utilizing Quizizz or Wayground in learning.

Results and Discussion

Twelve articles met the inclusion criteria and were reviewed to obtain important findings related to the effectiveness of Wayground Interactive Learning Media in mathematics learning. The articles obtained were from national and international publications in the period 2021-2025. The research methods were very diverse, namely quantitative (quasi-experimental) and qualitative (participatory action research, case studies, qualitative descriptive, classroom action research, research and development (R&D), and 4D development). The review results are presented as follows.

Table 1. Review Results of Articles

No	Author (Year)	Research Title	Method	Research Results
1	Ahmad et al., (2025)	Utilization of the Wayground Application as Interactive Learning at MA Darul Amin Palangka Raya	Participatory Action Research (PAR)	The use of the Wayground application is effective in increasing student participation, motivation, and understanding of lesson material.
2	Adikasari (2025)	Innovation of Wayground Flashcard Media to Improve Student Engagement in IPAS Learning in Elementary Schools	Qualitative approach with case study design	The use of Wayground flashcards in learning can improve student engagement, motivation, and conceptual understanding
3	Ridwan et al., (2024)	An Analysis of Wayground Application's Use as a Self-Study Tool at SMAN Jatinangor	Qualitative descriptive	Students have a positive perception of the Wayground application, which is effective in supporting the learning process, interesting, enjoyable, and easy to use.
4	Purwanti et al., (2024)	The Use of Interactive Quizizz Media to Strengthen Critical Thinking in Pancasila Education at SMA Negeri 10 Semarang	Classroom Action Research (CAR)	Quizizz effectively enhances students' critical thinking skills. Quizizz makes learning more interactive, enjoyable, and motivating.
5	Saputra et al., (2024)	The Effect of Using Interactive Learning Media Quizizz on Student Learning Outcomes in Grade 10 of the DKV Vocational Program at SMK Negeri 10 Malang	Quasi-Experimental	The use of the interactive learning medium Quizizz can have an effective influence and outcome on student learning outcomes

6	Abdilah et al., (2022)	The Utilization of Kahoot! and Quizizz Applications as Interactive Learning Media Based on Gamification	Qualitative descriptive	The use of the Quizizz and Kahoot! applications can have a positive impact on the learning process
7	Narawati et al., (2025)	Using Quizizz as an Interactive Learning Medium to Improve Cognitive Values in Elementary School Students	Research and Development (R&D)	Quizizz has been proven to be a valid, practical, and effective learning medium in improving students' cognitive values
8	Anofa, (2023)	The Use of Quizizz Interactive Application Media to Improve Learning Outcomes in Force and Motion Material for Grade 4 Students at SDN Dadaprejo 01, Batu City	Classroom Action Research (CAR)	The use of the Quizizz application as an innovative learning medium improves understanding in learning
9	Situmeang et al., (2022)	Development of Interactive Learning Media Through the Quizizz Application in Mathematics Lessons in Grade X at Kolang State High School 1	Research and Development (R&D)	The interactive learning media developed through the Quizizz application has proven to be feasible, practical, and effective in improving students' mathematics learning outcomes
10	Azmi et al., (2024)	Development of Interactive Learning Media Using PowerPoint Based on Classpoint for Middle School Mathematics Material	Development 4D	The interactive learning media based on Classpoint was declared valid with a validation score of 0.9 and practical with a percentage of 90.8%.
11	Malo et al., (2025)	Utilization of Canva as a Creative and Interactive Learning Media to Improve Junior High School Mathematics Learning Outcomes	Quasi-experiment	Interactive presentations using the Canva application can increase enthusiasm, active participation, and students' understanding of spatial geometry material in a concrete and visual manner.
12	Suharti (2021)	The Effectiveness of Implementing Interactive Learning	Quantitative with a Quasi-	There is a significant difference in the mathematics learning

	Media Based on Edmodo in Preparing for the Industrial Revolution 4.0 Era on Students' Mathematics Learning Outcomes	Experimental Design	outcomes of students who learn using Edmodo-based interactive learning media

Based on the 12 articles reviewed, it can be concluded that interactive learning can improve the effectiveness and learning outcomes of students. One interactive learning media that can be used is Wayground. The explanation will be presented as follows.

1. Wayground Features That Support Interactive Learning

The Wayground application has many features that can be used to facilitate teachers in implementing interactive learning. One feature that can be used is flashcards. According to Adikasari's (2025) research, the use of Wayground flashcards in IPAS learning in elementary schools can increase student engagement, motivation, and concept understanding. Based on research by Ahmad et al., (2025) Wayground's interactive features, such as digital quizzes, discussions, and real-time evaluations, can create a more interesting, creative, and innovative learning atmosphere. Teachers can easily monitor student progress and manage interactive learning.

Learning using Wayground has been proven effective in supporting the learning process. This is supported by research conducted by Ridwan et al., (2024) which states that students have a positive perception of the Wayground application, namely that it is effective in supporting the learning process, interesting, fun, and easy to use. In addition to utilizing attractive features using technology, Wayground also has a feature that allows students to play games without using devices. This feature is called Wayground Paper Mode. According to Elfiana et al., (2025) Wayground Paper Mode has proven to be a practical, valid, and relevant non-digital assessment tool. The use of Wayground Paper Mode is a solution for interactive learning without students using cell phones.

Based on the above discussion, Wayground has been proven to be effective in supporting interactive learning at various levels, making it suitable for use and supporting creative, innovative, and easy-to-use learning. These findings comprehensively support the principles of active learning and constructivism in learning, direct interaction with material, immediate feedback, and gamification elements that encourage students to process information more deeply, resulting in better mastery of concepts.

2. The Effect of Applying Wayground Interactive Learning Media on Student Motivation and Engagement in Mathematics Learning

The use of learning media is very important in increasing student motivation, especially in mathematics learning. There are various types of applications that support interactive learning, one of which is Wayground. Wayground has developed into a comprehensive learning platform and provides support for more interactive learning by using interactive presentations, analytical reading materials, flash cards, videos, and can generate content using AI (Dorssom, 2025). Ahmad et al., (2025) stated that the use of the Wayground application is effective in increasing student participation, motivation, and understanding of the subject matter.

Various interactive features such as digital quizzes, various game modes, and various types of questions motivate students to be more interactive in mathematics learning. The learning process makes students feel more interested and actively involved in learning because the material is presented in a competitive and fun way. This increase in motivation and engagement can be explained through Self-Determination Theory

(SDT), particularly the aspects of autonomy and competence. Wayground's interactive learning media gives students a sense of control (autonomy) over their own learning process and provides instant feedback that builds their sense of understanding the material and developing their abilities (competence), thereby triggering intrinsic motivation in learning.

3. Synthesis of the Effectiveness of Interactive Learning Media in Overcoming the Challenges of Abstract Mathematics Learning.

The results of the above study show that interactive learning media plays a very important role in bridging the gap between abstract mathematical concepts and student understanding. Malo et al., (2025) stated that interactive presentations using the Canva application were able to increase student enthusiasm, active participation, and understanding of spatial material in a concrete and visual manner. In addition, the results of research by Situmeang et al., (2022) state that interactive learning media developed through the Quizizz application have been proven to be feasible, practical, and effective in improving students' mathematics learning outcomes. Based on this research, it shows that interactive learning media are effective in overcoming the challenges of abstract mathematics learning because students actively participate in learning, thereby improving their mathematics learning outcomes.

This is in line with Yusnan (2025) who states that interactive learning media is a medium that enables direct interaction between students and learning materials because the main characteristic of interactive learning media is the immediate response given by the system to the actions taken. This finding is very relevant to the principles of mathematics learning theory, namely the Concrete-Representational-Abstract (CRA) Theory. Interactive media provide visual representations and simulations (Representational) that bridge abstract mathematical concepts. Features such as flashcards Adikasari (2025) or visual presentations Malo et al., (2025) serve as effective representation tools.

4. Relevance of Findings on Cross-Level Interactive Learning Media

Although most of the articles originate from elementary and high school levels, the findings are highly relevant and can be applied at the junior high school level. This can be seen based on the similarities in the cognitive and affective mechanisms that are influenced, namely during the cognitive transition to formal thinking, junior high school students are still very responsive to gamification and visualization elements to reinforce concepts, especially abstract ones. Wayground's interactive features, which have been proven effective in high schools for digital quizzes and discussions, can be adapted to the depth of junior high school material, such as in improving critical thinking skills (Purwanti et al., 2024). The effectiveness of interactive media is not limited to age but rather to the characteristics of media that can meet universal learning needs, namely interactivity, immediate feedback, and visual stimulation. Therefore, Wayground's paper mode, which has been proven practical in Madrasah Ibtidaiyah Elfiana et al., (2025) can be a relevant non-digital interactive solution in junior high schools with limited devices.

5. Implications of Wayground for Findings

a. Teachers are encouraged to adopt and integrate interactive platforms such as Wayground into their lesson planning. This platform is not just a technological gimmick, but a proven tool that can improve the effectiveness and learning outcomes of students.

b. Further training is needed to optimize the use of various Wayground features such as flashcards, interactive videos, interactive presentations, various types of questions, and Paper Mode. These skills include designing interactive materials, monitoring student progress in real-time, and providing quick feedback.

Overall, the research findings show that Wayground is a viable, practical, and effective interactive learning medium for use in various levels of education and all subjects, including mathematics at the junior high school level. Its use not only supports an engaging and easily managed learning process but also positively influences students' motivation, engagement, and conceptual understanding, thereby overcoming the challenges of abstract learning, such as in mathematics.

Conclusion

Based on a review of 12 articles focusing on the use of interactive learning media in learning, it can be concluded that interactive presentations are effective in learning. The synthesis results show that Wayground is a feasible, practical, and effective interactive learning media, supported by features such as digital quizzes, flashcards, interactive presentations, real-time evaluation, and Paper Mode, which significantly create learning that is easy to manage, interesting, creative, and innovative. The application of Wayground has been proven effective in increasing student motivation, engagement, active participation, and conceptual understanding. Its main advantage is its ability to bridge the abstract nature of mathematics through visual and concrete presentation of concepts, resulting in an enjoyable learning experience. Therefore, this study recommends the integration of Wayground into learning planning and teacher training so that its features can be optimally utilized to create more interactive mathematics learning at the junior high school level.

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