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Wordwall as An Interactive Media For Science Learning In Primary Schools Literature Study: (2020-2025)

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Abstract

This study aims to examine the use of Wordwall as an interactive learning medium in Natural and Social Sciences (IPAS) learning at the primary school level. The research employed a Systematic Literature Review (SLR) design to identify, screen, and synthesize relevant studies published between 2020 and 2025. Articles were retrieved from several academic databases, including Google Scholar, SINTA, DOAJ, and ResearchGate, using the Publish or Perish software. The selection process was conducted based on predefined inclusion criteria focusing on empirical studies related to Wordwall implementation in primary education. A total of 20 studies met the eligibility criteria and were further analyzed. In addition to qualitative synthesis, bibliometric mapping using VOSviewer was conducted to visualize keyword co-occurrence, thematic clusters, and research trends. The findings indicate that most of the reviewed studies report positive associations between the use of Wordwall and increased student motivation, engagement, and conceptual understanding in science-related subjects. However, variations in research design, sample characteristics, and outcome measures were observed across studies. Therefore, the conclusions drawn in this review are limited to the patterns identified in the selected literature. Overall, the results suggest that Wordwall has potential as an interactive digital medium to support primary science learning, while further rigorous empirical studies are recommended to strengthen the evidence base.

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1. INTRODUCTION

Learning in elementary school represents a critical foundational stage in the development of students' cognitive, social, and affective competencies. At this level, instructional strategies must not only ensure conceptual understanding but also foster motivation, engagement, and active participation in meaningful learning activities. Elementary students are in a developmental phase characterized by high curiosity, active exploration, and the need for concrete and visually stimulating learning experiences. Therefore, effective instruction at this stage requires approaches that integrate clarity of explanation, interactive participation, and contextual relevance. However, conventional teacher-centered approaches often encounter limitations in sustaining students' attention, particularly in science-related subjects that require conceptual clarity, inquiry processes, and contextual exploration. Lessons delivered predominantly through lectures and textbook-based explanations may not fully accommodate diverse learning styles or promote active engagement. In response to rapid technological advancements, digital-based learning media have increasingly been integrated into classroom practices to promote interactive and student-centered learning environments (Fajaryati et al., 2024).

The integration of digital media in primary education is closely aligned with the characteristics of contemporary learners who grow up in technology-rich environments. Students today are familiar with digital interfaces, multimedia content, and interactive platforms from an early age. As a result, instructional media that

incorporate elements of visual design, gamification, and immediate feedback are often perceived as more engaging than traditional approaches. In science learning, where abstract concepts such as energy transformation, ecosystems, matter, and natural phenomena must be understood conceptually, interactive visualization and practice activities can play an important role in strengthening comprehension. Digital tools may also facilitate formative assessment, enabling teachers to monitor student progress in real time while maintaining active classroom dynamics.

One digital platform that has gained attention in recent years is Wordwall. Wordwall provides interactive templates such as quizzes, matching games, word searches, grouping activities, and gamified exercises that can be adapted to various subject areas. Teachers can design customized content aligned with curriculum objectives and instantly transform learning materials into interactive activities. In the context of Natural and Social Sciences (IPAS) learning at the elementary level, the integration of interactive digital media is considered particularly relevant because IPAS emphasizes inquiry, observation, problem solving, and contextual understanding. Interactive tools may help present scientific concepts in a more accessible and engaging manner while also encouraging students to actively participate rather than passively receive information. Previous studies have reported positive classroom experiences and increased student participation associated with the use of Wordwall (Ningrum et al., 2020). Additionally, interactive digital tools are often associated with the development of higher-order thinking skills, collaboration, and creativity when implemented appropriately in classroom settings (Lestari & Rohmani, 2024).

Several empirical studies have examined the implementation of Wordwall in elementary science learning. Findings from these studies generally indicate improvements in student motivation, learning interest, classroom participation, and short-term academic performance, rather than conclusively proving effectiveness (Setyorini et al., 2024; Zulfah, 2023). Many researchers report higher posttest scores after the use of Wordwall-based activities, suggesting that interactive practice and immediate feedback may support reinforcement of conceptual understanding. However, these findings are often based on quasi-experimental or pre-experimental designs with limited sample sizes. Other research has shown that the integration of Wordwall within specific instructional models, such as Problem-Based Learning (PBL), may contribute to better pretest and posttest outcomes under certain classroom conditions (Rahmat et al., 2024). This suggests that the pedagogical framework surrounding the use of digital tools may significantly influence learning outcomes. Furthermore, some studies suggest that Wordwall supports more interactive classroom dynamics by encouraging active participation, peer interaction, and shared responsibility among students (Dugnol et al., 2021). Through competitive or collaborative game-based activities, students may experience increased enthusiasm and reduced anxiety in engaging with scientific material.

Despite these promising findings, it is important to approach the existing evidence with caution. Although prior studies provide valuable empirical insights, the body of literature remains fragmented and varies considerably in terms of research design, duration of implementation, measurement instruments, and outcome indicators. Many studies focus on immediate classroom impact rather than long-term retention or transfer of knowledge. Additionally, differences in contextual factors such as school infrastructure, teacher digital competence, and student access to devices may influence reported outcomes. Most studies are limited to small-scale classroom implementations and do not offer a comprehensive synthesis of evidence across diverse educational settings. Consequently, it remains unclear how consistent the reported outcomes are and what broader patterns can be identified regarding the role of Wordwall in elementary science education.

Another important consideration concerns the distinction between engagement and effectiveness. While increased motivation and participation are frequently reported, improvements in measurable academic achievement may depend on multiple interacting variables beyond the use of digital media alone. The novelty effect of technology, for instance, may temporarily increase student enthusiasm without necessarily guaranteeing sustained learning gains. Moreover, the quality of instructional design, clarity of learning objectives, and alignment between activities and assessment play critical roles in determining the overall impact of any educational intervention. Therefore, synthesizing findings across studies is essential to better understand the conditions under which Wordwall contributes meaningfully to science learning outcomes.

To date, there has been limited systematic effort to map research trends, examine thematic developments, and synthesize findings related specifically to Wordwall in IPAS learning at the primary school level within a defined timeframe. Although numerous classroom-based studies have been conducted, they are often dispersed across various journals and conference proceedings. Without a structured synthesis, it becomes difficult to identify dominant research themes, methodological patterns, and potential gaps in the literature. Therefore, a systematic review is necessary to consolidate existing evidence, identify recurring findings, and evaluate the overall direction of scholarly discussion on this topic. In addition, bibliometric mapping may help reveal publication trends, research collaborations, and thematic concentrations that characterize the development of Wordwall-related research between 2020 and 2025.

This study aims to analyze published research on the use of Wordwall as an interactive learning medium in Natural and Social Sciences (IPAS) learning at the elementary level from 2020 to 2025 through a Systematic Literature Review approach. Rather than claiming definitive effectiveness, this study seeks to synthesize reported findings, identify patterns of outcomes, and highlight potential implications as well as limitations within the existing literature. The review focuses on examining research objectives, methodological approaches, sample characteristics, and reported learning outcomes to provide a comprehensive overview of how Wordwall has been positioned within elementary science education. By providing a structured evidence-based synthesis, this research is expected to contribute to a clearer understanding of the pedagogical potential of Wordwall while acknowledging the current limitations of empirical evidence. Ultimately, the findings are intended to inform educators, researchers, and learning media developers in optimizing digital learning innovation in primary education and in designing future studies that employ more rigorous and longitudinal research frameworks.

2. LITERATURE REVIEW

Constructivism Theory

Constructivism theory is a well-known theory in the field of education. Before discussing its application in learning, it is important to understand the meaning of constructivism itself. Etymologically, constructivism comes from the word “construct,” which implies that knowledge is not passively received by learners, but actively built through experience, interaction, and reflection. In an educational context, this theory emphasizes that students play an active role in forming their own understanding of concepts and subject matter, and that learning occurs through discovery and personally meaningful experiences (Suparlan, 2019). According to Shymansky, constructivism is an active process in which learners independently construct their own knowledge, interpret the meaning of what they study, and integrate new concepts and ideas into their existing cognitive frameworks (Suparlan, 2019). According to Hill, constructivism is the process by which learners generate understanding or knowledge from what they study. In other words, constructivism emphasizes the importance of linking learning to real-life practice, so that the knowledge acquired can be useful and applied for the benefit of individuals and society (Suparlan, 2019). Based on expert opinions, it can be concluded that constructivism is a learning theory that emphasizes the active role of learners in constructing their own knowledge. Learners do not simply receive information passively; instead, they interpret the material studied, connect it with prior experiences, and apply it in real-life contexts to gain meaningful and useful understanding.

Constructivist learning theory is an educational approach that emphasizes that knowledge is not directly transmitted from teachers to students, but is actively constructed by learners through thinking processes, personal experiences, and interactions with their environment. From a constructivist perspective, students are seen as active participants in learning rather than passive recipients of information. Learning, therefore, is viewed as a process of constructing meaning based on prior knowledge as well as newly acquired information (Angglepi et al., 2025). In practice, constructivist theory positions the teacher not as the sole source of information, but as a facilitator who supports the students’ learning process. The teacher’s role is to create challenging learning situations, provide guidance, and assist students in discovering answers to questions or problems on their own. Consequently, learning becomes more meaningful because students are actively engaged in constructing their own knowledge. Constructivist-based learning offers advantages over traditional teacher-centered approaches. Through this approach, students do not merely memorize the material but also gain a deep understanding of concepts and are able to apply them in daily life. For these reasons, constructivism is highly relevant in education, as it fosters critical and creative thinking skills while also enhancing students’ ability to collaborate with others (Angglepi et al., 2025).

Digital Learning Media

Learning media is one of the components of learning resources that contains instructional materials within the students' learning environment, which functions to encourage and increase students' motivation to be more active and enthusiastic in the learning process (Mariyah et al., 2021). Digital learning media refers to various forms of technology-based communication tools, including both software and hardware, that are designed, developed, utilized, and managed to support learning activities so that the learning process can be carried out more effectively and efficiently (Okra, 2019). Digital-based learning media are learning tools that utilize technology to present materials in audio-visual form (Mariyah et al., 2021).

The presence of audio-visual elements in such media can help foster and even increase students’ learning motivation at various educational levels. Digital learning media can take the form of electronic tools such as e-books, websites, e-modules, flash media, interactive multimedia CDs, and other digital formats. The use of digital media in the learning process also brings new changes to teaching methods. Previously, learning activities were mostly conducted in the classroom; however, the use of digital technology allows learning to take place

more flexibly, including outside the classroom. In practice, teachers and lecturers can utilize various learning platforms such as blogs (Sitepu, 2022).

According to Kemp and Dayton (in Mustikawati, 2019), the use of media in learning provides several benefits, including the following.

1. Standardizing the delivery of learning materials
   Learning media help deliver instructional materials more uniformly so that differences in interpretation by educators can be minimized. As a result, students who receive material through the same media will obtain relatively similar information.
2. Increasing the attractiveness of the learning process
   The use of media can stimulate students' curiosity, encourage them to respond to teachers' explanations, and help clarify abstract concepts by making them more concrete. This can also create a more dynamic classroom atmosphere and reduce boredom.
3. Encouraging interaction in the learning process
   Media enable more active two-way communication between educators and students. Without media, the learning process tends to occur in a one-way communication pattern from the educator to the students.
4. Saving instructional time
   Through learning media, the delivery of materials can be carried out more efficiently, thereby reducing the amount of time needed for explanation.
5. Improving the quality of student learning
   The use of media makes the learning process more effective and helps students understand the subject matter more deeply and comprehensively.
6. Allowing learning to occur anytime and anywhere
   Learning media can be designed to be used flexibly so that students can learn not only in the classroom but also in various places and at different times.
7. Developing positive attitudes toward learning
   Attractive learning media can increase students' interest and appreciation toward the learning material and the learning process itself.
8. Changing the role of educators to be more productive
   With the help of learning media, educators do not need to repeatedly explain the same material. This allows them to focus more on guidance, consultation, and the management of the learning process.

Learning media come in various forms that can be used to facilitate the delivery of instructional materials to students. Each type of media has distinct characteristics and ways of presenting information, allowing educators to select the most appropriate medium based on learning objectives, the subject matter, and students' needs. In general, learning media can be classified into four main types: visual media, audio media, audio-visual media, and multimedia (Putri, 2020).

1. Visual Media

Visual media are learning tools that can only be seen and rely on the sense of sight to convey information. They help clarify concepts or materials presented by the teacher through images, text, or symbols. Using visual media can make the material more concrete and capture students' attention during the learning process. Examples of visual media include photographs, pictures, comics, posters, magazines, books, wall charts, miniatures, and other teaching aids used in the classroom.

2. Audio Media

Audio media deliver information through sound, relying on the sense of hearing. This type of media is particularly effective for teaching content related to listening skills, such as language pronunciation, music, or verbal explanations. By using audio media, students can focus more on the content conveyed through sound. Examples of audio media include voice recordings, songs or music, musical instruments, radio broadcasts, podcasts, audio cassettes, and CDs.

3. Audio-Visual Media

Audio-visual media combine sight and sound, engaging both hearing and vision simultaneously. This type of media is considered more effective because students not only hear explanations but also see visual representations of the material being taught. Audio-visual media can enhance students' comprehension and make the learning process more engaging and interactive. Examples include educational films, instructional videos, television programs, drama performances, and other digital video formats such as VCDs.

4. Multimedia

Multimedia integrates multiple types of media into a single learning system, combining text, images, sound, animation, and video to present information more comprehensively and interactively. The use of multimedia can provide a richer learning experience, as students receive information through several channels simultaneously. Examples of multimedia in learning include the Internet, online learning platforms, digital

learning applications, and distance learning systems that utilize information and communication technology (Putri, 2020).

Wordwall as an Interactive Learning Media

Wordwall is a web-based application that provides educational games in the form of engaging quizzes and can be used as a learning medium (Siddiq, 2021). Wordwall is an application that can be used as both a learning medium and an engaging assessment tool for students in the learning processs (Sari & Yarza, 2021). Wordwall is a website-based educational application that can be used as a learning medium to create an enjoyable learning environment and increase students' participation in the learning process. The Wordwall platform provides various types of interactive games that can be utilized in learning activities, such as quizzes, matching games, anagrams, word scrambles, word searches, and grouping activities. The use of this media is considered highly relevant in current learning conditions, where some schools still implement online learning systems or limit classroom hours, which may reduce the effectiveness of traditional teaching methods (Nurkholisha et al., 2024). (Putri, 2020) states that Wordwall can facilitate students in understanding learning materials through online learning and can also be easily used to identify students' learning achievement. Based on several expert opinions, it can be concluded that Wordwall is a web-based application used as a digital learning medium that provides various interactive educational games. This media helps deliver learning materials in a more engaging way, increases students' participation and learning motivation, and can also be used as an assessment tool to evaluate students' learning outcomes or achievements.

In its use as a digital learning medium, the Wordwall application offers various advantages that can support a more engaging and interactive learning process. However, like other learning media, Wordwall also has several limitations that need to be considered in its implementation.

1. Advantages of Wordwall

The use of Wordwall games in learning can create a more meaningful learning experience and is easier for elementary school students to follow, especially for lower-grade students. In addition, the game themes can be adjusted to students' learning styles and can be accompanied by background sounds or music that make the learning process more engaging. The assignment mode available in the Wordwall software also allows teachers to provide tasks directly to students through the platform (Putri, 2020).

2. Disadvantages of Wordwall

Despite its advantages, the use of Wordwall also has several limitations. One of the main limitations is its dependence on an internet connection to function effectively. Furthermore, not all features in Wordwall are available for free, as some features can only be accessed through the paid version (Putri, 2020).

Based on the literature review, Wordwall is not only an educational game platform but can also be linked to the principles of interactive and student-centered learning. By providing quizzes, matching games, anagrams, and grouping activities, Wordwall allows students to actively engage with learning materials. This aligns with constructivist theory, which emphasizes that students construct knowledge through direct experiences and interactions with the learning environment.

However, Wordwall also has limitations that need to be considered. Its reliance on an internet connection and some features that are only available in the paid version may pose challenges, particularly in schools with limited access to technology. Therefore, teachers need to strategically design the use of this media, for example by combining Wordwall with offline learning activities or group tasks to maximize student engagement.

In practice, Wordwall can also be used as a formative assessment tool, allowing teachers to monitor students' learning progress in real time through completed quizzes or games. This supports the implementation of differentiated instruction, where students can learn according to their own abilities and pace. Thus, Wordwall not only enhances cognitive aspects such as conceptual understanding but also supports students' affective aspects and learning motivation.

Overall, Wordwall can be considered a digital learning medium that is interactive, flexible, and promotes active student participation, while also providing an engaging and practical alternative for assessment. The integration of Wordwall into the learning process should still consider school conditions, teacher readiness, and access to technology to ensure the maximum benefits of this media are achieved.

2.1 Contribution of Digital Media to Science Learning

The use of digital media plays a crucial role in improving the quality of learning, particularly in Natural and Social Sciences (IPAS). According to Arsyad (2019), learning media serves as a tool that clarifies subject matter, thereby increasing student attention, motivation, and understanding. In the context of IPAS, digital media such as images, videos, simulations, and animations can help students understand abstract science and social concepts more concretely (Sanjaya, 2020). Furthermore, Mayer's (2009) Cognitive Theory of Multimedia Learning explains that students learn better through a combination of text, images, and sound than through a

single medium. This demonstrates that digital media scientifically supports improved conceptual understanding through visual and audio integration.

Digital media also increases motivation and learning engagement. According to Heinich et al. (2016), interactive media can create more meaningful learning experiences, encourage active participation, and foster collaboration among students. This is evident in the use of interactive quizzes and discussions based on digital platforms, which enable students to learn collaboratively and enjoyably.

Furthermore, learning aided by digital platforms such as Wordwall has been proven effective in improving students' critical thinking skills. Profithasari et al. (2024) stated that educational game-based digital media encourages students to analyze, evaluate, and draw conclusions independently. Through digital exploration, students can conduct virtual experiments, analyze data, and draw conclusions following the steps of the scientific method. From a teacher's perspective, digital media facilitates the implementation of learning evaluations. Automatic scoring systems in digital quizzes make it easier for teachers to monitor students' learning progress in real time (Sudjana & Rivai, 2015). Digital media also enables the implementation of the principle of differentiated instruction, as students can learn at their own pace and ability.

By being able to access information from the internet, students are also trained to select information appropriately and responsibly. This aligns with Gilster's (1997) theory of digital literacy, which emphasizes the ability to understand, evaluate, and use digital information wisely. From a pedagogical standpoint, the integration of digital media in science learning also aligns with the principles of student-centered learning, where learners actively participate in the learning process through exploration, interaction, and reflection. Interactive platforms such as Wordwall allow students to engage with scientific concepts through practice-based activities that provide immediate feedback. This supports deeper cognitive processing and reinforces conceptual understanding. Moreover, the gamified structure of Wordwall activities can reduce learning anxiety and increase students' willingness to participate in classroom tasks. As a result, the integration of digital media not only enhances cognitive outcomes but also supports affective and motivational aspects of learning, which are essential for effective science education at the elementary level.

Overall, digital media contributes greatly to making science learning more interesting, interactive, effective, and student-centered, as well as preparing them to face the challenges of the 21st century.

3. RESEARCH METHOD

This study employed a Systematic Literature Review (SLR) approach to systematically identify, evaluate, and synthesize research findings related to the use of Wordwall as an interactive learning medium in elementary science education. According to Creswell and Creswell (2018), a systematic review enables researchers to obtain a comprehensive understanding of a research phenomenon through a structured and transparent process of searching, screening, and synthesizing relevant studies. he SLR approach was chosen because it provides a rigorous and replicable framework that reduces bias compared to traditional narrative literature reviews, enabling researchers to capture comprehensive evidence, identify research trends, and highlight gaps in the existing literature (Snyder, 2019; Triandini et al., 2019).

The review process was conducted in several structured stages: identification, screening, eligibility assessment, and inclusion. The literature search was performed across multiple academic databases, including Google Scholar, SINTA, DOAJ, and ResearchGate, to ensure wide coverage of both national and international studies. Publish or Perish software was employed to manage search results efficiently. The main search string used was: ("Wordwall" AND "interactive media" AND ("elementary school" OR "primary school") AND ("science learning" OR "IPAS")), supplemented with additional keyword combinations to expand the scope of relevant studies. This strategy ensured a systematic, comprehensive, and replicable search process.

The inclusion criteria were defined as follows: (1) empirical studies examining the implementation of Wordwall in elementary or primary education settings; (2) studies published between 2020 and 2025; (3) articles written in English or Indonesian; and (4) publications available in full text. The exclusion criteria included: (1) opinion papers, editorials, or non-empirical reports; (2) studies not directly related to elementary science/IPAS learning; and (3) duplicated records across databases. The screening process was conducted in three stages. First, titles and abstracts were reviewed to determine relevance. Second, full-text articles were assessed based on the inclusion and exclusion criteria. Third, eligible studies were cross-checked to ensure alignment with the research objectives. This process followed established systematic review procedures to enhance transparency and methodological rigor (Snyder, 2019; Triandini et al., 2019).

From an initial search of approximately 500 records, duplicates and irrelevant studies were removed, leaving 200 articles for title and abstract screening. Subsequently, 100 articles were selected for full-text review, and after a detailed eligibility assessment, 20 studies met all criteria and were included in the final synthesis.

This purposive and rigorous selection ensures that the included studies are directly relevant to the research questions and maintain high empirical quality, providing a reliable basis for synthesis.

Data extraction was conducted systematically from each included study to obtain key information, including research design, sample characteristics, instructional model, outcome variables, and reported findings. This extraction process enabled structured comparison across studies and facilitated thematic synthesis of reported outcomes rather than relying solely on descriptive summaries. In addition to qualitative synthesis, bibliometric analysis was performed using VOSviewer software to visualize keyword co-occurrence, thematic clusters, and research development trends (Zupic & Čater, 2015). The bibliometric mapping was used to complement, not replace, the systematic synthesis of empirical findings.

Through these structured procedures, this study provides a transparent, evidence-informed overview of research trends and reported outcomes related to Wordwall in elementary science education. However, it should be noted that this review does not include meta-analysis or statistical effect-size synthesis, so conclusions are limited to observable patterns and findings from the selected literature. The rigorous approach, clear inclusion/exclusion criteria, and structured data extraction collectively strengthen the methodological quality and reproducibility of this review..

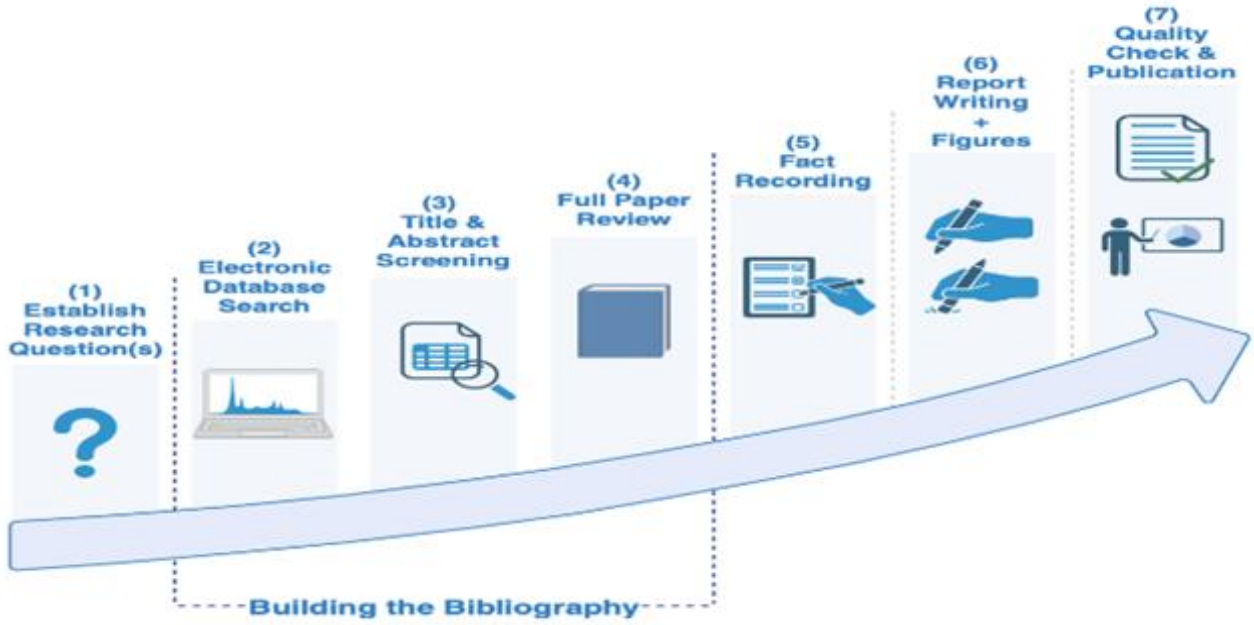

Figure 1. SLR (Systematic Literature Review) Flowchart

4. RESULT AND DISCUSSION

Overview of Reviewed Articles

This study reviewed 20 empirical articles examining the use of Wordwall as an interactive learning medium in elementary education. The reviewed articles consist of studies focusing on learning outcomes, student motivation, engagement, media development, and digital literacy. Table 1 presents a summary of the selected studies, including the researchers, research titles, and main findings.

Table 1. Research Summary

Researchers	Research Title	Main Findings
Setyorini, D.	Penerapan Media Pembelajaran Wordwall dalam Meningkatkan Hasil Belajar Siswa	Wordwall improves learning outcomes of fifth grade students.
Nurkholis, N.	Dampak Penggunaan Aplikasi Wordwall Terhadap Motivasi Belajar Siswa SDN 2 Tegaltaman	Wordwalls increase student motivation and participation.
Zulfah Nadirotus	Pemanfaatan Media Game Edukasi Wordwall untuk Meningkatkan Minat Belajar Siswa	Wordwalls increase students' interest in learning.
Aini et al.	Pengembangan Media Game Edukasi Wordwall sebagai Media Pembelajaran Bahasa Indonesia Siswa SD	Wordwall media is very valid and worth using.
Anisa Rahmadanti	Efektivitas Media Wordwall untuk Meningkatkan Hasil Belajar Matematika Siswa SD	Learning outcomes increased based on pretest–posttest.

Researchers	Research Title	Main Findings
Sri Widiyanti	Efektivitas Wordwall dalam Meningkatkan Minat dan Hasil Belajar IPAS	Wordwalls increase interest and thematic learning outcomes.
Ani Febriyaningsih	Penerapan PBL dengan Bantuan Wordwall untuk Meningkatkan Hasil Belajar IPAS	Science learning outcomes improved.
Margaretha	Pengembangan Media Interaktif Berbasis Wordwall untuk Meningkatkan Keterampilan Berpikir Kreatif	Wordwalls effectively improve creative thinking skills.
Naila et al.	Literasi Digital bagi Guru dan Siswa SD: Analisis Konten dalam Pembelajaran	Supporting the improvement of digital literacy of teachers and students.
Tahani Abd Al-Aziz	Pengaruh Wordwall terhadap Prestasi dan Motivasi Belajar Matematika Siswa Kelas VI	Wordwalls enhance cognitive achievement.
Zabina Renata	Penggunaan Media Game Edukasi Wordwall untuk Meningkatkan Motivasi Belajar	Wordwalls effectively increase motivation and creative thinking.
Taryzca Putri	Efektivitas Media Wordwall untuk Meningkatkan Motivasi Belajar IPAS	Pretest–posttest showed an increase in learning outcomes.
Salsabila Putri et al.	Pemanfaatan Wordwall untuk Meningkatkan Keaktifan Belajar IPAS	Classes are more interactive, dynamic, and fun.
Fikri Haikal Azmi et al.	Pengaruh Wordwall terhadap Kemampuan Membaca Permulaan Siswa SD	Wordwalls are effective in building basic literacy.
Amril et al.	Pengembangan Media Wordwall pada Mata Pelajaran IPA Kelas V	Validity is very high (89.43%) and practical to use.
Maharani Amrillah & Venny Herli Sundi	Keterlibatan Siswa dalam Pembelajaran IPAS melalui Media Wordwall	Wordwalls increase student engagement.
Soviyatul Khoiriyah & Sumadi	Pengembangan Media Wordwall pada Mata Pelajaran IPAS	Wordwall is valid, practical, and effective.
Usman et al.	Efektivitas Media Wordwall Berbasis Game terhadap Hasil Belajar Siswa Kelas IV	Very effective for improving Indonesian language learning outcomes.
Nurul Mulia et al.	Efektivitas Media Wordwall terhadap Hasil Belajar IPA	Has a significant impact on science learning outcomes.
Fitri Hamidah et al.	Peningkatan Literasi Digital Siswa SD melalui Wordwall	Wordwalls are effective and meet the needs of 21st century education.

Several studies emphasize improvements in students' academic performance. For example, research conducted by Setyorini demonstrates that the application of Wordwall significantly improves the learning outcomes of fifth-grade students. Similar results are reported by Anisa Rahmadanti and Taryzca Putri, whose pretest–posttest analyses indicate measurable gains in mathematics and IPAS learning outcomes after the use of Wordwall. Tahani Abd Al-Aziz also reports enhanced cognitive achievement in sixth-grade mathematics, while Nurul Mulia and colleagues identify a significant positive impact on science learning outcomes. These findings suggest that Wordwall may serve as an effective reinforcement tool that supports conceptual understanding through interactive practice and immediate feedback.

Beyond academic achievement, many studies focus on motivational and affective aspects of learning. Nurkholis highlights that the use of the Wordwall application increases student motivation and participation in elementary classrooms. Likewise, Zulfah Nadirotus and Zabina Renata report increased learning interest and motivation through educational game-based activities. Sri Widiyanti's study further confirms that Wordwall enhances both interest and thematic learning outcomes in IPAS subjects. Collectively, these studies indicate that gamified digital activities contribute to a more engaging learning atmosphere, reducing monotony and encouraging active involvement.

Another recurring theme in the literature is student engagement and classroom interaction. Maharani Amrillah and Venny Herli Sundi emphasize that Wordwall increases student involvement in IPAS learning activities. Similarly, Salsabila Putri and colleagues observe that classes become more interactive, dynamic, and enjoyable when Wordwall is integrated into instruction. These findings suggest that Wordwall not only

functions as a content delivery tool but also transforms classroom dynamics by promoting collaboration, participation, and shared learning experiences.

Several studies adopt a development research approach, focusing on the validity and practicality of Wordwall-based media. Aini et al. conclude that Wordwall educational game media are highly valid and appropriate for use in elementary Indonesian language instruction. Amril et al. report a very high validity score (89.43%) and strong practicality in science learning media development. Soviyatul Khoiriyah and Sumadi similarly describe Wordwall as valid, practical, and effective for IPAS learning. These development-oriented studies reinforce the feasibility of integrating Wordwall into structured instructional design frameworks.

In addition to improving subject-specific outcomes, Wordwall is also associated with broader competencies. Margaretha reports that interactive Wordwall-based media effectively enhance students' creative thinking skills. Fikri Haikal Azmi and colleagues demonstrate its effectiveness in supporting early reading literacy, while Fitri Hamidah and colleagues emphasize its contribution to strengthening digital literacy competencies aligned with 21st-century education demands. Furthermore, Naila et al. highlight the importance of digital literacy for both teachers and students, positioning Wordwall as a supportive platform within technology-integrated learning environments.

Taken together, the research summarized in Table 1 indicates a dominant trend toward positive perceptions and outcomes regarding Wordwall implementation in primary schools. Although methodological variations exist across studies, the overall pattern suggests that Wordwall contributes to improvements in cognitive achievement, motivation, engagement, creative thinking, literacy skills, and digital competence. These findings provide a strong empirical basis for further systematic analysis and synthesis of Wordwall's pedagogical potential in elementary science and interdisciplinary learning contexts.

Publication Trends of Wordwall Research (2020–2025)

Based on the analysis of 20 articles discussing the use of wordwalls as interactive media in elementary schools, we can explain how this digital learning medium is applied in the context of elementary education. The following table presents the distribution of articles found by year of publication, covering articles published between 2020 and 2025. These findings highlight developments in the use of wordwalls as learning aids and provide insight into their effectiveness in elementary school settings. Thus, the information collected is not only relevant for understanding the implementation of wordwalls but also important for designing policies and strategies for developing learning media at the elementary education level.

The increasing number of studies also indicates that interactive digital platforms are becoming more widely recognized as tools that support student-centered learning. In elementary education, where students tend to respond more positively to visual and game-based learning experiences, digital media such as Wordwall can provide an engaging learning environment that encourages active participation. This trend reflects a broader shift in educational practice toward integrating technology that facilitates interaction, immediate feedback, and learner autonomy in classroom activities.

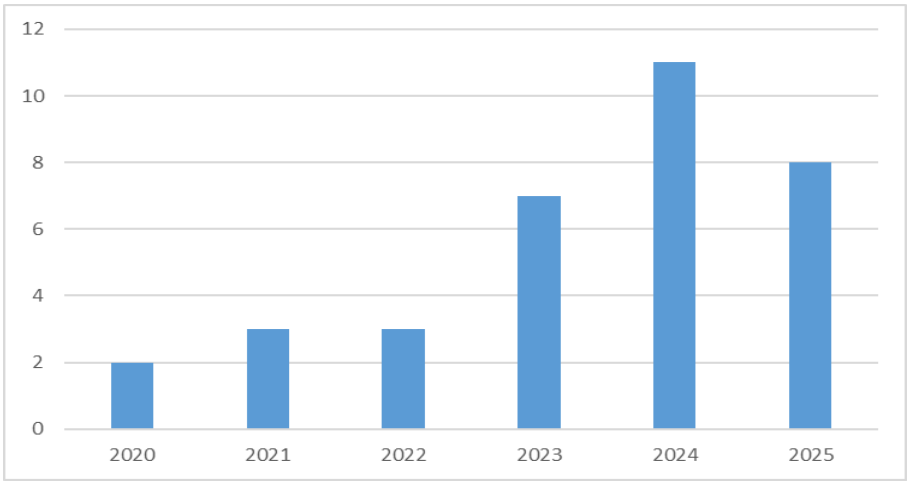

Figure 2. Publication Graph on the Use of Wordwalls in Elementary Schools

This graph depicts journal publications on the use of wordwalls in elementary schools from 2020 to 2025. The graph shows that the number of publications began to experience a significant spike in 2023 and reached a peak in 2024. During 2020 and 2021, the number of publications was relatively low, with only two or three articles appearing. In 2024, the number of articles discussing interactive wordwall media in elementary schools increased sharply, reaching around 11 articles. In 2025, the number of publications decreased again, with only

a few articles released. This shows that interest in researching the use of wordwalls in elementary schools grew rapidly in 2024, influenced by the increased use of technology in education during the Covid-19 pandemic and the subsequent recovery process in elementary school learning. After Covid, students became more interested in learning using wordwall technology due to the long period of learning being carried out at home.

Beyond the numerical increase in publications, the pattern also reflects the growing attention of researchers toward digital learning tools that can enhance classroom engagement. The peak in 2024 suggests that Wordwall began to be widely explored not only as a supporting tool but also as a pedagogical medium capable of structuring interactive learning activities. This indicates that educators are increasingly interested in exploring digital platforms that combine educational content with gamified learning elements.

The increase in publications in 2023–2024 was previously associated with broader digital transformation in education. However, it is important to emphasize that this review does not include empirical data directly linking the increase in Wordwall publications to specific external factors such as the COVID-19 pandemic. Therefore, any reference to pandemic-related educational shifts should be interpreted cautiously and not as a verified causal explanation.

The bibliometric mapping presented in this study primarily serves to illustrate publication distribution, keyword co-occurrence, and thematic development over time. It does not provide direct empirical evidence regarding instructional effectiveness. Thus, while the visualization demonstrates a rise in scholarly attention and thematic shifts toward effectiveness studies, the interpretation of these trends must remain limited to observable publication patterns rather than inferred educational impact.

Wordwall Digital Media Usage Trends in 2020-2025

Bibliometric analysis of publications between 2020 and 2025 indicates a clear upward trend in research on the use of Wordwall as an interactive learning medium. Although studies began to emerge around 2020, the number of publications increased significantly in the 2022–2025 period. This growth is reflected in the rising number of journal articles and conference proceedings that specifically examine the integration of Wordwall in classroom settings, particularly in elementary education. The expansion of research during this timeframe aligns with the broader acceleration of digital transformation in education and the increased adoption of online and blended learning environments.

Keyword mapping further reveals that early studies primarily focused on themes such as learning motivation, student interest, and classroom engagement. Over time, however, the research focus has expanded to include more analytical and outcome-oriented themes, including effectiveness, learning outcomes, instructional models, and higher-order thinking skills. This shift suggests that scholarly attention has moved beyond exploratory implementation toward evaluating measurable impacts and pedagogical integration strategies. The growing emphasis on effectiveness and structured learning models indicates a maturation of research trends, as scholars increasingly seek empirical validation rather than descriptive accounts of classroom practice.

In recent years, Wordwall has also been examined within the framework of specific instructional approaches, such as Problem-Based Learning (PBL), inquiry-based learning, and collaborative learning models. This development demonstrates a trend toward integrating digital tools within established pedagogical frameworks rather than treating them as standalone innovations. The convergence of interactive media and instructional design reflects a deeper understanding that technology integration must be aligned with learning objectives and cognitive processes to produce meaningful educational outcomes.

Supporting this trend, a study by Mulyanti and Gading (2023) confirms that the use of digital interactive media can contribute not only to academic achievement but also to the development of critical thinking and collaborative skills. Their findings reinforce the broader bibliometric pattern showing increasing scholarly interest in the relationship between digital media use and 21st-century competencies. Overall, the 2020–2025 period demonstrates a progressive expansion in both the quantity and thematic depth of research on Wordwall, highlighting its growing relevance within primary education contexts.

From a theoretical perspective, the increasing scholarly attention toward Wordwall can also be interpreted through the lens of constructivist learning theory, which emphasizes that students actively construct knowledge through interaction with learning materials and their environment. Interactive digital platforms such as Wordwall provide opportunities for students to engage directly with content through quizzes, matching activities, and problem-solving tasks. This aligns with constructivist principles that promote active learning, exploration, and knowledge construction rather than passive information reception. In addition, the gamified nature of Wordwall reflects principles of game-based learning, where elements such as competition, instant feedback, and interactive challenges can stimulate curiosity and sustain student engagement. Therefore, the growth of research on Wordwall not only reflects technological trends in education but also corresponds with pedagogical shifts toward student-centered and interactive learning environments.

4.1 Bibliometric Analysis Using VOSviewer

Bibliometric analysis was conducted using VOSviewer 1.6.20, resulting in three main types of maps: network visualization, overlay visualization, and density visualization.

1. **Network Visualization**

   The collected article bibliographic data was exported in . RIS or .CSV format, then processed with VOSviewer 1.6.20 to produce three types of visualization maps.

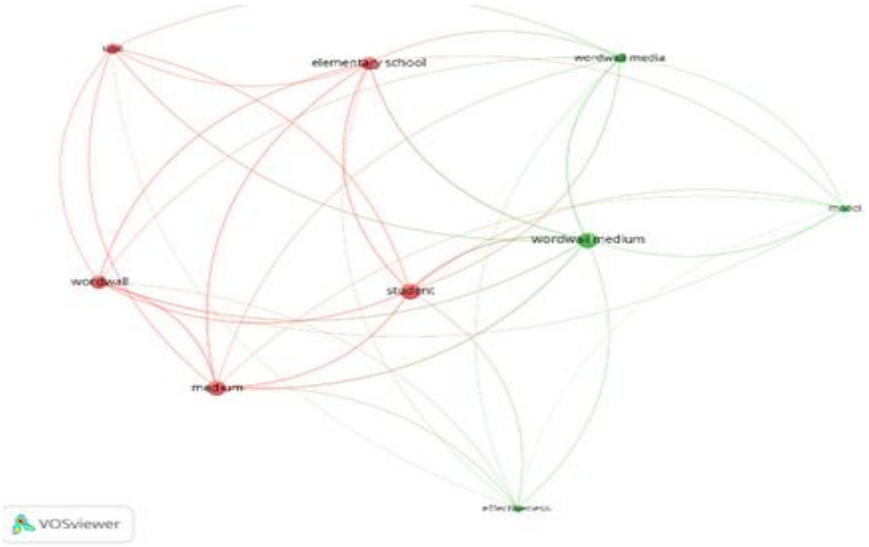

Figure 3. Analysis Using Vosviewer

This VOSviewer image shows that research on Wordwalls is divided into two main groups. The first group (red) discusses the use of Wordwalls in elementary schools by students, and the second group (green) discusses the effectiveness and learning models using Wordwalls. Words like "student" and "medium" serve as a link between the two groups.

The presence of these connecting keywords suggests that student interaction with learning media remains the central focus of most studies. In other words, Wordwall is often examined not only as a technological tool but also as a pedagogical medium that mediates the learning process between teachers, students, and instructional content. This connection reflects the importance of aligning digital tools with instructional strategies to ensure that technology integration contributes meaningfully to learning experiences.

2. **Overlay Visualization**

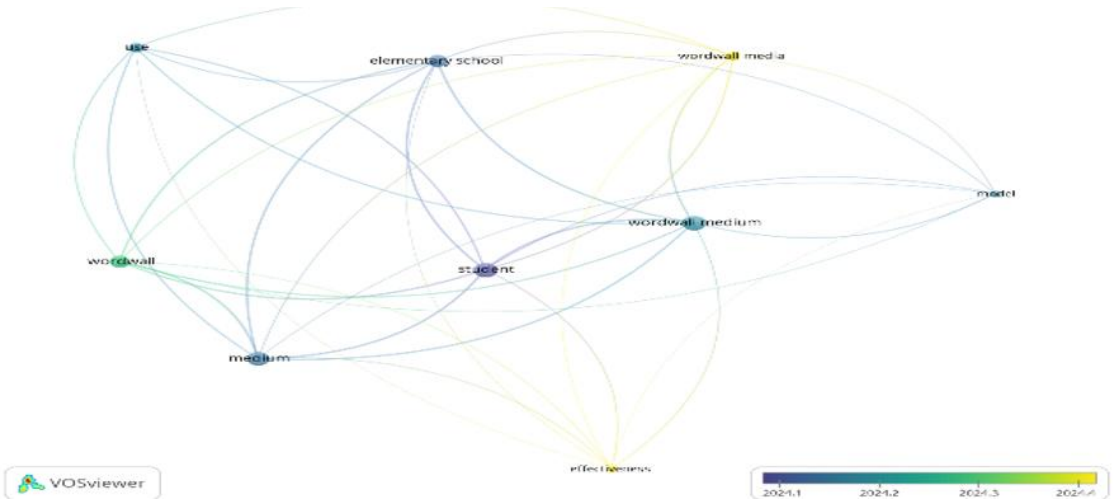

Figure 4. Overlay Visualization

The overlay analysis results show that blue indicates earlier research (early 2024). Yellow indicates more recent research (late 2024). Words like "student," "medium," and "elementary school" appeared early on. The terms "effectiveness" and "wordwall media" appeared later, indicating that current research focuses more on the effectiveness of wordwalls as a learning medium.

This pattern suggests a gradual evolution of research themes. Early studies tended to focus on the introduction and implementation of Wordwall in classroom settings, while more recent studies attempt to evaluate its impact on learning processes and outcomes. Such a progression is common in emerging educational technologies, where initial research emphasizes feasibility and classroom application before moving toward systematic evaluation of learning effectiveness.

3. Density Visualization

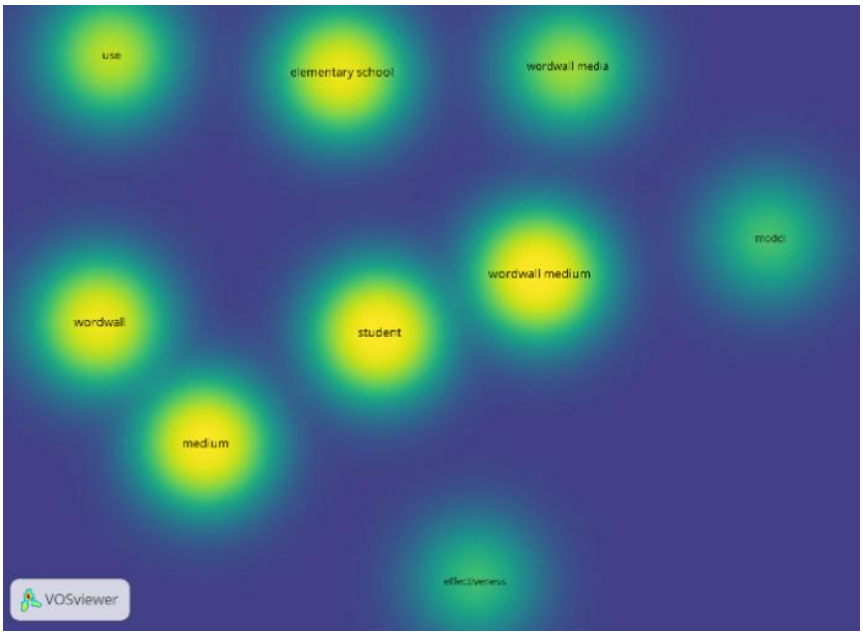

Figure 5. Density visualization

Although the bibliometric analysis offers valuable insight into research clusters and thematic evolution, it should be noted that keyword co-occurrence and density mapping do not inherently measure the strength of empirical evidence. The presence of terms such as “effectiveness” or “learning outcomes” in later publications indicates a thematic focus in recent studies; however, it does not automatically confirm methodological rigor or the consistency of effect magnitude across different research contexts. Therefore, bibliometric findings in this review are interpreted primarily as indicators of research trends rather than definitive evidence of instructional effectiveness.

A rigorous synthesis of effectiveness requires a more structured comparison of research designs, statistical results, sample characteristics, and intervention duration, rather than relying solely on publication frequency or visualization patterns. Consequently, bibliometric analysis should be complemented with deeper qualitative evaluation to provide a more comprehensive understanding of the pedagogical impact of digital learning media such as Wordwall..

4.2 Research Gap and Research Implications

The bibliometric analysis highlights several research gaps within the existing literature. While themes such as learning media, student engagement, and learning effectiveness frequently appear in previous studies, several areas remain relatively underexplored. These include the development of more advanced interactive media, longitudinal investigations on digital literacy development, and the integration of digital learning innovations aligned with the Independent Curriculum.

In addition, many existing studies are still limited to small-scale classroom implementations and descriptive research approaches. Only a limited number of studies apply rigorous experimental or quasi-experimental research designs, standardized measurement instruments, or long-term evaluation methods. As a result, although current findings generally report positive outcomes, the available evidence has not yet fully established strong causal relationships regarding the instructional effectiveness of Wordwall.

Future research is therefore recommended to employ more robust methodological approaches, including experimental or quasi-experimental designs, larger and more diverse sample populations, and cross-institutional

collaborations. Furthermore, the inclusion of effect-size reporting and longitudinal learning outcome measurements would significantly strengthen the empirical evidence base regarding the educational impact of Wordwall as an interactive digital learning medium.

5. CONCLUSION

This study reviewed 20 empirical articles published between 2020 and 2025 examining the use of Wordwall as an interactive learning medium in elementary education. The findings indicate a growing research interest in Wordwall implementation, particularly in relation to student engagement and short-term learning outcomes. Rather than demonstrating a definitive transformation of learning practices, the reviewed studies suggest a consistent pattern of positive classroom-level responses when Wordwall is integrated into instructional activities.

The bibliometric mapping illustrates thematic development from initial implementation-focused studies toward research examining effectiveness and instructional integration. However, bibliometric trends reflect publication patterns rather than direct measures of pedagogical impact. Therefore, conclusions regarding instructional transformation must remain proportionate to the empirical scope of the included studies.

Across the reviewed literature, Wordwall is frequently positioned as a supportive digital tool that enhances classroom interactivity, formative assessment, and student participation. Evidence from the analyzed studies suggests improvements in motivation and post-intervention achievement scores; however, most findings are based on short-term classroom studies with limited sample sizes and varied methodological designs. Consequently, while the results indicate promising instructional potential, they do not yet establish large-scale or long-term effectiveness.

Conceptually, Wordwall may contribute to more engaging and participatory learning environments when aligned with appropriate pedagogical strategies. Its integration within structured instructional models appears to play a crucial role in shaping learning outcomes, indicating that technological tools function most effectively when pedagogically grounded.

This review contributes to the field by synthesizing current research patterns and identifying methodological gaps, including the need for longitudinal studies, standardized measurement instruments, and broader comparative research designs. Future investigations are recommended to examine sustained learning impact, curriculum alignment, and measurable development of higher-order thinking skills using more rigorous research frameworks.

Overall, Wordwall demonstrates potential as an interactive digital learning medium in elementary science education; however, further systematic and large-scale research is required to strengthen the evidence base and support broader educational claims.

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REFERENCES

Aini, MN, Khasanah, LAIU, & Mudayan, A. (2024). Development of Wordwall Educational Game Media as Indonesian Language Learning Media for Elementary School Students. Journal of Teacher Studies and Learning , 7 (2), 780–789. https://doi.org/10.30605/jsgp.7.2.2024.4144

Amril, A., Darniyanti, Y., & Sapitri, D. R. (2023). Pengembangan Media Pembelajaran Menggunakan Wordwall Pada Mata Pelajaran Ipa Kelas V Sekolah Dasar. *Innovative: Journal Of Social Science Research*, *3*(3), 9593–9607. Retrieved from https://j-innovative.org/index.php/Innovative/article/view/2927

Amrillah, M., & Sundi, VH (2024). Developing the Engagement of Fifth Grade Students of UPTD SDN Serua 01 South Tangerang in Science Learning through Wordwall Application-Based Learning Media. Semnasfip , 903–912. https://jurnal.umj.ac.id/index.php/SEMNASFIP/article/view/23658

Angglepi, M. S., Sakilah, Azzahra, A., & Suwandi, R. (2025). Teori Belajar Konstruktivisme. 4(4), 7329–7339. https://publisherqu.com/index.php/pediaqu/article/view/3140/2783

Aritonang, NS, Purba, N., & Sianturi, CL (2025). The Effect of Wordwall Learning Media on the Science Learning Outcomes of Fourth Grade Students of SD Negeri 155676 Nauli 2, Sitahuis District. Innovative: Journal of Social Science Research , 5 (3), 289–306. https://doi.org/10.31004/innovative.v5i3.19026

Booth, A., Sutton, A., & Papaioannou, D. (2016). Systematic approaches to a successful literature review (2nd ed.). SAGE Publications. https://www.scirp.org/reference/referencespapers?referenceid=3614115

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications. https://books.google.co.id/books?id=335ZDwAAQBAJ&printsec=frontcover&hl=id#v=onepage&q&f=false

Dahniar, N. (2025). Enhancing English Learning Outcomes with Joyful Learning-Based Wordwall Media in Primary Schools. APLIKATIF: Journal of Research Trends in Social Sciences and Humanities, 4(1), 95–104. https://doi.org/10.59110/aplikatif.v4i1.568

Dewi, SEK, Dewi, TR, & Pertiwi, RP (2025). The Use of Wordwall Media in Thematic Learning to Increase Student Learning Motivation in Elementary Schools. JEMARI (Journal of … . http://journal.unuha.ac.id/index.php/jemari/article/view/4375

Dugnol-Menéndez, J., Jiménez-Arberas, E., Ruiz-Fernández, M. L., Fernández-Valera, D., Mok, A., & Merayo-Lloves, J. (2021). A collaborative escape room as gamification strategy to increase learning motivation and develop curricular skills of occupational therapy students. BMC Medical Education, 21(1), 544-555. https://doi.org/10.1186/s12909-021-02973-5

Fajaryati, D., Ratnawati, E., Bahari, Y. ., & Warneri. (2024). Utilization Of Wordwall In Formative Assessment To Improve Students' Learning Outcomes In Physics Subjects. IJESS International Journal of Education and Social Science, 5(2), 202–208. https://doi.org/10.56371/ijess.v5i2.315

Febriyaningsih, A., Huda, C., Rahayu, S., & Nuvitalia, D. (2024). Pengaruh Model Pembelajaran Problem Based Learning Berbantu Media Wordwall terhadap Hasil Belajar IPAS Siswa Kelas IV SDN Mlatiharjo 02 Semarang. *Innovative: Journal Of Social Science Research*, *4*(4), 12917–12924. https://doi.org/10.31004/innovative.v4i4.13784

Handoyo E, Chandra, C., Saleh, M., Rahman, A., & Darmawan, P. (2024). The Use of Wordwall-Based Learning Media in the Independent Learning Era to Increase Elementary School Students' Interest in Learning. JEMARI (Journal… . http://journal.unuha.ac.id/index.php/jemari/article/view/4375

Avandy, B. I., Suryanti, H. H. S., & Irmade, O. (2024). Efektivitas Game Edukasi Berbantuan Aplikasi Wordwall terhadap Minat Siswa dan Hasil Belajar IPAS Kelas V Sekolah Dasar. *Journal on Education*, *7*(1), 5722-5729. https://doi.org/10.31004/joe.v7i1.7099

Khoiriyah, Soviyatul, S. (2022). Development of Podcast-Based Learning Media. DedekMU : Journal of Community Service , 4 (4), 442. https://doi.org/10.30587/dedicationmu.v4i4.4825

Lestari, R., & Rohmani, R. (2024). Analysis of the Effectiveness of Wordwall Media Use on Science Learning Outcomes in Elementary Schools. IJORER : International Journal of Recent Educational Research, 5(4), 891-905. https://doi.org/10.46245/ijorer.v5i4.634

Mariyah, Y. S., Budiman, A., Rohayani, H., & Audina, W. D. (2021). Meningkatkan Motivasi Belajar Siswa Melalui Pemanfaatan Media Audio Visual : Studi Eksperimen Dalam Pembelajaran Tari Increasing Student Motivation Through the Use of Audio Visual Media : Experimental Study in Dance Learning. 4(2), 959–967. https://doi.org/10.34007/jehss.v4i2.778

M. Nabut, Y., Lehan, AAD, Nawa, NEA, W. Ndolu, S., & Hali, AS (2024). The Effect of Wordwall Learning Media on Students' Creative Thinking Skills in the Social Sciences Subject of Grade IV Uptd Sd Inpres Lasiana, Kupang City. Journal of Elementary Education Science , 09 (September), 400–410.

Margareta, S., & Julianto. (2025). Development of Wordwall-Based Interactive Media to Improve Creative Thinking Skills of Fourth Grade Elementary School Students on Energy Transformation Material . 13 (2), 364–379.

Mulyanti, NMB, & Gading, IK (2023). The impact of implementing a guided inquiry learning model on science learning outcomes and students' critical thinking skills. Scientific Journal of Teacher Professional Education , 6 (1), 109–119.

Mustikawati, F. E. (2019). Fungsi Aplikasi Kahoot sebagai Media Pembelajaran Bahasa Indonesia. 99–104. https://ejournal.unib.ac.id/index.php/semiba

Ningrum, Y., Apriyani, D., & Zikriah, Z. (2020). The design of learning media to get to know asmaul husna based on android. Journal of Research and Application of Informatics Students (Jrami), 1(04). https://doi.org/10.30998/jrami.v1i04.466

Nurkholisha, R., Nurmalia, L., & Hayun, M. (2024). Implementation of Wordwall Media in Science Learning to Improve Learning Outcomes of Class 4A Students of MIS Al-Hidayah. Semnasfip , 306–314. https://jurnal.umj.ac.id/index.php/SEMNASFIP/article/view/23531%0Ahttps://jurnal.umj.ac.id/index.php/SEMNASFIP/article/viewFile/23531/10876

Nurpatini, & Hidayat, T. (2025). The Effect of Wordwall Learning Media on Science Learning Outcomes for Fourth Grade Elementary School Students on the Material "Me and My Needs." Indonesian Journal of Education and Learning (JPPI) , 5 (3), 1368–1376. https://doi.org/10.53299/jppi.v5i3.1781

Okra, R. (2019). Pengembangan Media Pembelajaran Digital IPA Di SMP N 3 Kecamatan Pangkalan. 4(2). https://doi.org/https://doi.org/10.30983/educative.v4i2.2340

Pradani, T. G**.** (2022). Penggunaan media pembelajaran Wordwall untuk meningkatkan minat dan motivasi belajar siswa pada pembelajaran IPA di sekolah dasar. *Educenter: Jurnal Ilmiah Pendidikan, 1*(11), 806–811. https://doi.org/10.55904/educenter.v1i11.162

Profithasari, N., Lutfiani, UI, & Rapani, R. (2024). The Effectiveness of Brain-Based Learning Assisted by Wordwalls on Students' Critical Thinking Skills. Journal of Teacher Studies and Learning , 7 (1), 399–408. https://doi.org/10.30605/jsgp.7.1.2024.3841

Putri, F. M. (2020). Efektivitas penggunaan aplikasi wordwall dalam pembelajaran daring (online) matematika pada materi bilangan cacah kelas 1 di min 2 kota tangerang selatan [Program Studi Pendidikan Guru Madrasah Ibtidaiyah Fakultas Ilmu Tarbiyah dan Keguruan UIN Syarif Hidayatullah Jakarta]. http://repository.uinjkt.ac.id/dspace/bitstream/123456789/54622/1/11160183000046

Putriani, N., & Gunawan, R. (2023). Interactive Wordwall Games Media to Increase Learning Activeness of Fourth Grade Elementary School Students in Science Content. Journal of Education Action Research , 7 (3), 409–415. https://doi.org/10.23887/jear.v7i3.66527

Rahma, L., & Widyaningrum, HK (2024). The Use of Wordwall Learning Media to Improve Learning Outcomes of Grade IV A Students at Patihan Elementary School, Madiun City. MARAS: Journal of … . http://ejournal.lumbungpare.org/index.php/maras/article/view/427

Rahmat, R., Ismail, I., & Nursin, N. (2024). Word-Wall Education Game To Enhance Literacy Skills In Elementary Schools (Issue ICstee 2023). Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-210-1_11

Ramadhani, TPL, VK, AM, Ramadila, CD, & Pratiwi, DE (2025). The Effectiveness of Using Wordwall Learning Media to Increase Motivation in Learning Natural Sciences. RISOMA: Journal of Social, Humanities and Educational Research , 3 (2), 108–115.

Safitri, D., Awalia, S., Sekaringtyas, T., Nuraini, S., Lestari, I., Suntari, Y., … Sudrajat, A. (2022). Improvement of Student Learning Motivation through Word-Wall-based Digital Game Media. International Journal of Interactive Mobile Technologies (iJIM), 16(06), pp. 188–205. https://doi.org/10.3991/ijim.v16i06.25729

Sakri, D. (2024). The Use of the Wordwall Application as an Effort to Improve Digital Literacy and Student Learning Outcomes in the Pancasila Education Subject for Grade V of SD Negeri Pengkol 01 Nguter Sukoharjo. Tambusai Education Journal , 8 , 35968–35973. https://jptam.org/index.php/jptam/article/view/19336

Sari, P. M., & Yarza, H. N. (2021). Pelatihan Penggunaan Aplikasi QUIZIZZ dan Wordwall Pada Pembelajaran IPA Bagi Guru-Guru SDIT Al-Kahfi. 4(April), 195–199. https://media.neliti.com/media/publications/534675-none-70cd4978.pdf

Septiani, LE, Sudiana, IN, Putrayasa, IB, Studi, P., Dasar, P., Pascasarjana, P., & Ganesha, UP (2025). Educational Game Media Wordwall Topic of Earth Shapes In. Journal of Educational Research and Evaluation , 15 (1), 85–98.

Setyorini, D., Suneki, S., Prayitno, M., & Prasetiawati, C. (2024). IMPROVING LEARNING INTEREST BY USING WORDWALL MEDIA IN GRADE 4 ELEMENTARY SCHOOLS. Jurnal Sinekti , 7 (1), 25–31. https://doi.org/10.33061/js.v7i1.8885

Siddiq, J. (2021). Inovasi Pemanfaatan Word-Wall Sebagai Media Game-Based Learning Untuk Bahasa Arab. 05. https://doi.org/https://doi.org/10.33754/jalie.v5i1.337

Sitepu, E. N. (2022). Media Pembelajaran Berbasis Digital. 1, 242–248. https://doi.org/10.34007/ppd.v1i1.195

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. Journal of Business Research, 104, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Sopacua, J., Johansz, D., Lestari, & Ratumanan, SD (2025). The Effect of Using Wordwall-Based Interactive Media on Fourth Grade Students' Learning Outcomes in Science Subjects at SD Inpres Tomra. Pendas: Scientific Journal of Elementary Education , 10 (2), 2477–2143.

Suparlan. (2019). Teori Konstruktivisme Dalam Pembelajaran. 1(2), 79–88. https://ejournal.stitpn.ac.id/index.php/islamika

Tamarengki, O., & Lana, K. (2025). Optimization of Wordwall-Based Physics Educational Game Media (GEMIKA) to Improve Digital Literacy of Class X SMANKOR North Maluku. KUANTUM: Journal of Learning and Physics Science , 6 (1), 1–8. https://doi.org/10.63976/kuantum.v6i1.803

Usman, Musrifah, FA (2023). LP2M-Makassar State University Effectiveness of Game-Based Wordwall Media on Learning Outcomes of Fourth Grade Students of UPTD SD Negeri 145 Barru . 385–402.

Wulandari, Thania, Ulfa Hasanah, Rusi, Tri Fadhillah, W. (2024). Systematic Literature Review: Students' Mathematical Proof Ability. Journal of International Multidisciplinary Research , 2 (6), 797–803. https://doi.org/10.62504/jimr719

Zulfah, N. (2023). Utilization of Wordwall Educational Game Media to Increase Student Learning Interest. Pubmedia Indonesian Classroom Action Research Journal , 1 (1), 11. https://doi.org/10.47134/ptk.v1i1.5

Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. Organizational Research Methods, 18(3), 429–472. https://doi.org/10.1177/1094428114562629