

IMPROVING FOURTH-GRADE STUDENTS' REASONING SKILLS THROUGH THE DEVELOPMENT OF WORDWALL-BASED LEARNING MATERIALS

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ABSTRAK	
Comparison learning is an important part of the elementary school mathematics curriculum. This concept helps students understand the relationships between different quantities, both numerically and visually. This study aims to determine the effect of the Wordwall learning medium on the mathematical reasoning skills related to comparison material among fourth-grade elementary school students. In this study, the author employed a descriptive qualitative research method. The author collected several journals and articles as reference materials for the study and to supplement the information within the research. Data collection techniques included literature searches and reviews from various sources, such as books, scientific journals, articles, and other documents. Additionally, a questionnaire was distributed to enhance the validity of our research. Through a literature review and curriculum analysis, this study concludes that learning about comparisons can be enhanced by using various representations, such as pictures, diagrams, and concrete models. Furthermore, it is important to connect the concept of comparison to students' daily lives to make learning more meaningful. Based on our research data, we found that the implementation of the Wordwall learning media had an impact on improving the reasoning skills of fourth-grade students in comparative material; thus, after the implementation of this learning media, students' reasoning skills improved, and students felt assisted by the Wordwall learning media. The effective use of this learning media resulted in efficient use of time and alleviated the teacher's burden in conveying learning messages. Keywords: <i>Comparison, Mathematics, Students, Curriculum</i>	Article History Submitted: 22 October 2025 Received: 15 April 2026 Published: 31 August 2026

A. INTRODUCTION

Reasoning skills, which encompass a broad spectrum of cognitive processes, are among the most crucial competencies that must be meticulously cultivated in children during their primary school years, as these abilities encompass vital elements such as logical reasoning, analytical thought, and critical thinking methodologies that are absolutely essential for grappling with more intricate concepts across various academic disciplines, mathematics being a primary focus. Within the realm of mathematics, one particular topic that necessitates a significant degree of reasoning proficiency is the concept of comparison, specifically in understanding ratios. Grasping the intricacies of comparison is fundamentally important because it enables children to effectively measure, contrast, and correlate two or more objects or values in a proportional manner, which is a skill that can serve them well in numerous contexts.

As posited by Hidayati (2020), the enhancement of logical thinking skills during the formative years has a profound impact on students' future academic performance, setting a solid groundwork for their continued educational journey. Furthermore, Wulandari (2021) emphasizes that robust analytical skills are imperative for aiding students in connecting novel information with the foundational knowledge they have previously acquired, thereby enriching their learning experiences. The perspective offered by Sari & Supriyanto (2022) reinforces the notion that the cultivation of these skills proves beneficial not only within academic settings but also in various aspects of life outside of school.

The development of reasoning abilities in elementary school children serves as a critical cornerstone for their broader cognitive growth and intellectual maturation. When children possess strong reasoning skills, they are better equipped to comprehend the relationships that exist between various objects or phenomena in their environment, enabling them to make more informed decisions based on logical deductions and develop a coherent mindset rooted in reasoning. According to Aminah (2023), a well-honed capacity for reasoning is instrumental in fostering the advancement of higher-order cognitive abilities that are sustained over time, which is crucial for academic success.

These reasoning skills are not solely applicable to the study of mathematics; rather, they extend their relevance to a multitude of subjects and to everyday decision-making processes. Conversely, a solid foundation in reasoning skills significantly aids students in tackling mathematical challenges in a manner that is both systematic and methodical. This assertion is substantiated by research conducted by Pramono (2021), which indicates that students who exhibit strong reasoning capabilities demonstrate a greater efficacy and efficiency in resolving mathematical problems.

Nevertheless, in practical educational contexts, it is observed that not all primary school students possess a comprehensive understanding of comparative material, which can pose significant challenges to their learning. This particular difficulty often arises from students' insufficient ability to connect mathematical concepts to real-world situations and contexts that they encounter in their daily lives. For instance, children may struggle to comprehend the concepts of proportion and ratio if the instructional methodologies employed are overly abstract and fail to incorporate tangible examples that they can relate to.

As noted by Zulkarnain (2021), a considerable number of students encounter obstacles in grasping the concept of ratio, primarily due to a lack of meaningful interaction and practical application in their everyday experiences. In light of this, Setiawan & Yulianti (2023) emphasize the critical importance of educators adopting a more interactive pedagogical approach when teaching these concepts, which should ideally involve the utilization of suitable learning media, thereby facilitating a more accessible understanding of the material for students. Moreover, the insights provided by Astuti & Nugroho (2022) suggest that active engagement in mathematical learning experiences can significantly enhance students' comprehension of

mathematical concepts, ultimately leading to a deeper and more effective learning process.

One of the educational resources that has recently begun to gain significant traction in the realm of teaching comparison subjects is the innovative platform known as Wordwall, which is rapidly becoming a staple in contemporary pedagogical practices. This particular educational medium not only presents captivating and imaginative visual representations but also empowers educators to design interactive educational games that engage students in a dynamic manner. Research conducted by Lestari in the year 2023 indicates that the integration of technology-driven learning tools, such as Wordwall, has the potential to substantially enhance student engagement throughout the teaching and learning process, thereby fostering a more immersive educational environment.

The incorporation of Wordwall into the learning experience enables students to partake actively in their educational journey, which in turn aids in their comprehension of comparison concepts through the use of tangible and relatable visual aids that facilitate deeper understanding. According to the scholarly opinions of Suhardi and Fitria in 2022, this interactive medium not only enriches the learning experience but also transforms it into a more enjoyable and stimulating endeavor, leading to heightened levels of interest and involvement from students during the learning activities. This assertion is corroborated by the findings of Darsyah in 2022, which emphasize that engaging with interactive media in educational settings can significantly contribute to the development of students' critical thinking abilities, thereby preparing them for more complex cognitive challenges.

Thus, the implementation of Wordwall as a learning medium appears to be exceptionally pertinent in supporting elementary school students as they cultivate their reasoning skills, which are essential for their academic and personal growth. This medium is particularly effective in facilitating students' grasp of the concept of comparison, allowing them to more readily apply this concept within the context of their everyday lives and experiences. Research undertaken by Mustika in 2023 further substantiates the claim that the utilization of interactive learning media, such as Wordwall, can lead to marked improvements in student learning outcomes across a variety of academic disciplines, including mathematics, which is a critical area of focus in primary education.

Consequently, this study was meticulously designed to ascertain the degree to which the application of Wordwall learning media influences students' comprehension of comparison material, as well as to evaluate its subsequent impact on their overall academic performance and learning outcomes. Additionally, the study aspires to provide a comprehensive overview of the effectiveness associated with the integration of interactive media within primary school instructional methodologies. The overarching objective of this investigation was to identify and elucidate the influence exerted by the use of Wordwall learning media on enhancing the reasoning capabilities of fourth-grade students, particularly concerning mathematical topics related to comparative material.

B. RESEARCH METHODOLOGY

In the context of this particular academic investigation, the researchers employed a comprehensive data triangulation technique that was initially proposed by the renowned scholars Miles and Huberman; this technique emphasizes the importance of utilizing a diverse array of sources or methodologies in order to bolster the credibility and overall validity of the research outcomes. Specifically, within the realm of methodological triangulation, the researchers judiciously incorporated both direct observational strategies and survey methodologies, while in the realm of data source triangulation, the researchers undertook the task of directly interviewing fourth-grade students from elementary educational institutions to ensure the acquisition of reliable and valid data. Furthermore, this study was meticulously conducted with the active involvement of multiple researchers collaborating to enhance the rigor and depth of the investigative process, and additionally, the research utilized an assortment of theoretical frameworks to interpret the collected data, thereby ensuring that the findings emerged not solely from a singular perspective or method, but rather as a result of a more thorough and multifaceted examination of the subject matter.

The author also adeptly employed descriptive qualitative research methodologies to facilitate the exploration of the topic at hand, wherein the author systematically gathered an array of journals and scholarly articles that served as pivotal reference points for the research endeavor as well as sources of valuable information enhancement throughout the investigation. The techniques for data collection were executed through an extensive search and meticulous review of literature derived from a multitude of sources, which included an array of books, peer-reviewed scientific journals, informative articles, and various other relevant documents. The foundation of the study rests upon a diverse collection of scholarly articles that were subsequently analyzed, scrutinized, and processed in a methodical manner to extract meaningful insights. In essence, the overarching objective of the literature review was to address and resolve specific research problems by diligently searching for and critically examining previously established writings within the academic discourse.

C. RESULTS AND DISCUSSION

To effectively implement a curriculum that utilizes digital-based learning media in relation to comparative materials, it is posited that a blended learning approach serves as a remarkably advantageous strategy. This blended learning methodology intricately intertwines digital interactive learning experiences with practical hands-on applications, thereby enabling students to not only immerse themselves in active learning but also to engage directly in solving real-world problems that they may encounter outside the classroom environment. The incorporation of the Wordwall Games application is anticipated to significantly enhance student engagement levels, facilitate a deeper understanding of ratio concepts, and substantially improve the reasoning abilities of the students involved in this learning process. The initial phase of this comprehensive strategy necessitates the employment of an inquiry-based learning approach, wherein educators are encouraged to

present stimuli that take the form of everyday issues pertaining to comparison; for instance, they might analyze the comparative prices of various goods found in the marketplace or evaluate the distances traversed during a trip. These types of interactive discussions serve to bridge the gap between theoretical concepts of comparison and the practical realities of everyday life, rendering the learning experience not only more pertinent but also more comprehensible for the students. During this critical stage, learners are invited to delve into an exploration of various potential solutions, thereby commencing the development of their foundational understanding of the intricate concept of ratio.

As an advancement in pedagogical strategy, the Wordwall Games application is employed to assess and measure the extent of students' comprehension regarding the material that has been presented. This innovative application offers a series of interactive quizzes that grant students the opportunity to practice comparison-related questions within an enjoyable and engaging atmosphere. Engaging in this activity not only reinforces the concepts that have been previously learned, but it also serves to heighten students' intrinsic motivation through the playful experience of learning while simultaneously playing. This specific approach effectively integrates elements of game-based learning, which has the potential to substantially elevate student interest and engagement throughout the overall learning process.

The learning model that is optimally aligned with this strategic approach is the cooperative learning model, which encourages students to collaborate in small groups as they work on tasks that are based on the Wordwall platform. Through this collaborative effort, students not only cultivate critical thinking and problem-solving competencies, but they also refine their ability to work cooperatively as part of a team. Furthermore, this cooperative learning environment provides a valuable opportunity for students to share their understanding with one another and offer assistance, thereby reinforcing their grasp of the concept of comparison as they learn from their peers.

In conclusion, the integration of digital learning media, such as the Wordwall application, is not solely effective in facilitating students' comprehension of complex concepts; it also possesses the capacity to enhance their motivation to learn. The appealing visual elements and interactive gaming components assist students in maintaining their focus and enjoying the overall learning experience. Consequently, the process of learning about comparative concepts transforms into an activity that is not only more enjoyable but also significantly more meaningful and relevant for the students involved. Furthermore, the incorporation of this advanced technology affords students the invaluable opportunity to cultivate critical and analytical thinking skills that are essential for grasping more intricate mathematical concepts as they advance to higher levels of education.

This can be seen from the results of the questionnaire on the use of Wordwall as a learning tool for the topic of ratios, as shown in the table below:

Table 1.1 Results of the Questionnaire on the Use of Wordwall as a Learning Tool

Survey	Strongly Disagree	Disagree	Agree	Strongly Agree
I find it easier to understand the concept of comparison after participating in lessons using Wordwall.			65,6%	34, %
The Wordwall platform has helped me become more interested in learning about comparisons.			65,6%	34, %
Using Wordwall makes learning about comparisons more fun.		3,1%	53,1%	43,8%
The games on Wordwall help me remember the material on comparisons more quickly		6,3%	65,6%	28,1%
Using digital media like Wordwall has made me more actively involved in comparative learning.		3,1%	59, %	37,%%
I feel more confident tackling comparison problems after using Wordwall.			71,9%	28,1%
The interactive games on Wordwall make me more enthusiastic about learning about comparisons			65,6%	34,4%
Using Wordwall makes me feel that learning comparisons is easier than ever before			71,9%	28,1%
Learning with Wordwall helped me understand the material on ratios more quickly.	3,1%	3,1%	68,8%	25%
I prefer learning with digital tools like Wordwall rather than conventional methods.		3,1%	56,3%	40,6%
I feel that Wordwall helps me learn through play-based learning, especially when it comes to comparison exercises.			65,6%	34,4%
Using Wordwall has made me more interested in learning other topics related to math.		9,4%	56,3%	34,4%

Upon careful analysis of the aforementioned survey data, it was determined that the implementation of Wordwall Games as a learning medium significantly contributed to the enhancement of reasoning abilities among fourth-grade students specifically in the context of comparison material; consequently, following the integration of this innovative learning resource, there was a notable improvement in the students' reasoning capabilities, and the learners expressed that they felt considerably supported

by the introduction of the Wordwall learning medium into their educational experience. Moreover, the educational medium employed not only facilitates effective outcomes in terms of the efficiency of time utilization during instructional periods but also substantially alleviates the instructional load experienced by teachers as they endeavor to convey complex learning messages to their students, as evidenced by the findings presented by Hasan in the year 2021.

Additionally, the incorporation of Wordwall Games as a learning medium during evaluative phases of instruction has been shown to positively influence the overall engagement and liveliness of students in their learning pursuits. It is worth noting that the introduction of educational media that has not previously been utilized within the learning environment tends to capture students' interest more effectively, thereby allowing them to maintain a heightened level of focus and concentration during the learning process. This heightened interest, in turn, serves to further reinforce the educational objectives aimed at fostering deeper cognitive engagement and understanding among the learners. Ultimately, the strategic application of such innovative learning tools is crucial in creating a dynamic and interactive learning atmosphere that not only enhances student engagement but also promotes the development of critical reasoning skills essential for their academic success.

D. CONCLUSION

The scholarly inquiry into the evolution and enhancement of digital educational media, particularly when amalgamated with the application known as Wordwall Games, underscores the profound efficacy of this pedagogical method in bolstering students' comprehension of comparative concepts, particularly among those in the fourth grade. The incorporation of advanced digital media platforms, such as the Wordwall Games, offers an array of interactive quizzes that not only captivate students' attention but also significantly enhance their intrinsic motivation to engage in the learning process.

This innovative approach transcends mere enjoyment in educational experiences; it also facilitates the development of essential skills in communication, collaboration, creativity, and critical thinking that are imperative for holistic student development. Furthermore, the utilization of such digital media serves to optimize the efficiency with which educators can impart knowledge, thereby conserving valuable instructional time and allowing for a more concentrated focus on meaningful discussions and a deeper understanding of complex concepts.

The integration of gamified elements into the learning environment fosters increased student engagement, and empirical research substantiates that these interactive methodologies yield favorable outcomes in students' academic performance, effectively equipping them to tackle more intricate mathematical challenges as they advance in their studies. Consequently, the advancement and application of game-based digital learning media emerge as innovative solutions that respond adeptly to the myriad challenges faced in the domain of primary mathematics education.

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