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Journal of General Education and Humanities Vol. 5, No. 1, February 2026, pp. 369 – 378, https://doi.org/10.58421/gehu.v5i1.985 ISSN 2963-7147 369 Journal homepage: https://journal-gehu.com/index.php/gehu Implementation Of Gamification Learning Methods Using the Wordwall Application to Improve Students' Higher-Order Thinking Skills Nisaiy Darussakinah Harahap1, Siti Maysarah2 1,2Universitas Islam Negeri Sumatera Utara, Jalan Williem Iskandar Pasar V Medan Estate, Indonesia Article Info ABSTRACT Article history: Received 2025-12-08 Revised 2026-01-02 Accepted 2026-01-03 The low level of Higher Order Thinking Skills (HOTS) among junior high school students, especially in mathematics, indicates the need for technology-based learning innovations to train higher-level thinking skills. The low level of Higher Order Thinking Skills (HOTS) among eighth-grade students at Harapan 3 Junior High School, which is still dominated by lower-level thinking skills, is a problem in mathematics learning. The purpose of this study was to determine the effect of implementing a gamification learning method, assisted by the Wordwall application, on improving HOTS among eighth-grade students at SMP Harapan 3. This study used a quantitative approach, a quasi-experimental design, and a pretest-posttest nonequivalent control group design. The research instrument was an essay test 1 that had been validated and was reliable for measuring students' HOTS abilities in the aspects of analysis, evaluation, and creation. The data were analysed using the Shapiro-Wilk normality test and Levene's homogeneity-of-variance test to guide the selection of statistical analysis techniques. Because the data were not normally distributed, the difference analysis was performed using the Mann-Whitney U Test, a nonparametric test and N-Gain calculation. 3 The results showed that Wordwall-assisted gamification learning was significantly more effective than conventional learning in improving students' HOTS abilities. Keywords: Gamification Higher Order Thinking Skills (HOTS). Wordwall Corresponding Author: Nisaiy Darussakinah Harahap Universitas Islam Negeri Sumatera Utara, Jalan Williem Iskandar Pasar V Medan Estate, Indonesia Email: nisaiy0305211015@uinsu.ac.id 1. INTRODUCTION Education is one of the fundamental aspects of the effort to develop quality human resources able to compete in the era of globalisation. 1 The development of science, technology, and communication demands an education system that not only transmits knowledge cognitively but also develops higher-order thinking skills (HOTS). HOTS includes logical, critical, creative, and reflective thinking skills, as well as the metacognitive

https://doi.org/10.58421/gehu.v5i1.985 370 abilities needed to deal with complex problems in the modern era [1]. Through quality and adaptive education, students are expected to develop deep-thinking skills, not just memorise facts or concepts superficially. 4 The development of communication and information technology brings great potential for the world of education to innovate in learning methods. Various applications and digital platforms can be utilised 1 to improve the effectiveness and appeal of the learning process. Thus, education can address the challenges of globalisation while enhancing students' competence in affective, psychomotor, and cognitive domains. 1 Higher Order Thinking Skills (HOTS) are considered high-level thinking skills according to Bloom's taxonomy, which includes evaluation, creation, and analysis [2]. 2 In the context of education, HOTS are mental skills that encourage students to synthesise, examine, and modify their knowledge to gain new insights. 1 For example, a student who can integrate mathematical concepts to solve real-world problems demonstrates higher-order thinking skills. Students must possess 3 higher-order thinking skills because the most needed competency in the modern era is higher-order thinking skills [3]. Mathematics is a subject with characteristics 2 different from those of other subjects because it is structured deductively and sequentially, starting with concepts, definitions, and properties and progressing to applications. The thinking process in mathematics requires students to understand concepts in depth, engage in logical reasoning, and apply these concepts in various situations. 1 This shows that mathematics learning is closely related to Higher Order Thinking Skills (HOTS) [4]. To develop this reasoning ability, continuous assessment is needed to measure students' cognitive mastery accurately. Classroom assessments help educators understand students' abilities in critical thinking, problemsolving, and analysing complex information. Assessment instruments such as multiplechoice and essay tests are commonly used tools to measure cognitive aspects, including higher-order thinking skills [5]. The development of HOTS plays an important role because it can help students become willing to face the challenges of the real world, which is dynamic and complex. Yusuf [6] states that these skills include the ability to analyse, evaluate, and create, which help students become reliable problem solvers and enable them to think critically and innovatively. Therefore, in the curriculum and learning process, educators need to instil HOTS values so that students can apply and develop their knowledge across various contexts. Based on preliminary studies and observations at SMP Harapan 3, mastery of HOTS among eighth-grade students remained very low. Mathematics learning outcome reports showed that the average student score was below the minimum passing grade (KKM) of 68. This was evident from daily evaluations and midterm exams. This condition proves that the majority of students still rely on lower-order thinking skills (LOTS), which emphasise memorisation and basic understanding of the material without the ability to analyse or evaluate in depth [23]. The condition of mathematics learning in schools still relies on teachers, resulting in students not actively contributing to the learning process. This is relevant to the findings of Maysarah [7], which proves that teachers do not often apply learning methods that involve student contribution. Learning is still teacher-centred, rarely uses the surrounding

 environment as a learning resource, and still minimises questions that require HOTS thinking. This situation demonstrates the need for learning innovations that encourage student involvement and develop their higher-order thinking skills. This phenomenon is also reinforced by students' classroom behaviour, which tends to be passive and rarely prompts questions that require deeper conceptual understanding. In addition, students still rely on examples and solutions provided by teachers. This condition indicates a lack of stimulation for students to think at a higher level. Wahyuningsih [8] also shared a similar view, stating that many educators find it difficult to design learning that effectively integrates HOTS, resulting in students lacking experiences that encourage creativity and analysis. One factor that hinders the implementation of HOTS is educators' limited understanding and ability to use learning technology and to design activities that challenge students' cognitive abilities. Many educators still use conventional methods that are monotonous and do not engage students in active thinking. In addition, facility constraints, such as limited access to digital devices and the internet, are also obstacles to optimising technology-based learning [9]. Educators also face difficulties in providing valid evaluation instruments to measure students' higher-order thinking skills. Without the right measuring tools, the process of developing HOTS becomes less focused and less than optimal [10]. This condition means that efforts to improve HOTS must be supported by innovative learning methods that align with today's students' characteristics. Previous research has also shown that students' mathematical critical thinking skills are still considered low. Based on the findings in the article "Analysis of Mathematical Critical Thinking Skills," many students have difficulty identifying important information, understanding problems in depth, and providing logical reasons when solving mathematical problems. This low critical thinking ability affects students' suboptimal achievement in HOTS indicators, particularly in the analysis (C4) and evaluation (C5) domains. This condition shows that the ongoing learning process has not trained students to think at a high level, so learning innovations are needed that can stimulate critical thinking skills and support students to contribute to the learning process actively [11]. One innovation that is increasingly being applied to develop student motivation and contribution is the implementation of gamification methods [19]. Gamification is the application of game elements in a non-game context to encourage student engagement, motivation, and learning activities [12]. By incorporating game elements, the learning process becomes more enjoyable and interesting, and can increase student focus on the material. In mathematics learning, gamification can help students observe abstract concepts interactively and concretely. For example, through challenges, scores, time limits, and competitions packaged as educational games, students are more motivated to think critically, analytically, and creatively to solve math problems. Wordwall is a web-based learning platform that offers a variety of interactive templates, such as games, quizzes, and exercises, that can be tailored to educators' needs and learning materials. Using Wordwall, educators can create flexible, gamified activities that students can access on digital devices such as smartphones or tablets, without needing a computer. Wordwall features such as scoring, time

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limits, and engaging visual and audio elements can create a competitive learning environment. In addition, Wordwall makes it easier for educators to monitor student progress in real time and provide quick feedback, making the learning process more responsive and focused [13]. The use of Wordwall in mathematics learning, especially in eighth-grade junior high school, is expected to be an effective solution to help students overcome difficulties in developing HOTS. Through gamification assisted by the Wordwall application, students will be encouraged to actively participate, think critically, and hone their analytical and evaluative skills [24]. Although various studies have shown that the application of gamification and the use of wordwall media can increase student motivation and learning outcomes, research that specifically examines the effect of gamification learning methods assisted by wordwall applications on improving Higher Order Thinking Skills (HOTS) in junior high school students, particularly in eighth-grade mathematics, is still limited. In addition, previous studies have focused more on motivation and learning outcomes, whereas those on improving higher-order thinking skills, such as analysis, evaluation, and creation, have not been widely conducted. Therefore, empirical research is needed to test the effectiveness of Wordwall-assisted gamified learning in improving students' HOTS. Given the importance of HOTS in education and the potential of Wordwall-assisted gamification methods to improve these skills, this research aims to determine the extent to which implementing this learning method can enhance HOTS abilities among eighth-grade students at Harapan 3 Junior High School. It is hoped that 2 the results of this research can provide recommendations and insights for teachers in developing innovative learning strategies that are in line with the interests of today's students, as well as being able to provide an interactive, enjoyable, 12 and effective learning process [20]. Therefore, it is hoped that this research will not only 4 contribute to the academic field but also, in practice, improve the quality of mathematics learning and develop adaptive, competitive human resources in the future. 2. METHOD This 8 research was conducted at Harapan 3 Private Junior High School, located at Jalan Karya Wisata Ujung No. 31, Gedung Johor, Medan Johor District, Medan City, North Sumatra Province. 2 The research was conducted in August, during the odd semester of the 2025/2026 academic year. The sample was determined using purposive sampling based on the equivalence of the initial abilities of the classes and the recommendations of the subject teachers. Two classes were selected as samples, namely: Table 1. Research Sample Grade Class Division Number Of Students Class Type VIII VIII-A 30 Experimental Class VIII-D 30 Control Class The total number of research samples was 60 students.

https://doi.org/10.58421/gehu.v5i1.985 373 This study will apply a quantitative method with a quasi-experimental approach [14] and a pretest-posttest nonequivalent 1 control group design [15]. Two classes will be selected as samples without randomisation [16], namely one experimental class that applies the wordwall method and one control class that is given the conventional method. 2 The research design is outlined in the following table: Table 2. Research Design Group Pretest Treatment Posttest Experimental Class O1 X O2 Control Class O3 - O4 The instrument used was an essay test 1 to measure students' HOTS, covering three aspects, namely analysis (C4), evaluation (C5), and creation (C6). The instrument was developed based on a grid that referred to HOTS indicators and the learning materials studied by eighth-grade students. The test consists of several essay questions 12 that require students to analyse information, provide reasons or assessments, and create appropriate solution strategies. Scoring uses a HOTS assessment rubric that has been determined in accordance with the indicators (analysing, evaluating, creating) [22]. To ensure the quality of the research instrument [18], a validity test was conducted on each essay item used to measure students' Higher Order Thinking Skills (HOTS). The validity test aimed to determine whether each item was able to measure the intended HOTS indicators appropriately. The results of the item validity testing are presented in Table 3. Table 3. Instrument Validity Test Results No Validity Descripsion ***r count*** ***r table*** 1a 0.515 0.361 Valid 1b 0.454 0.361 Valid 1c 0.394 0.361 Valid 2a 0.509 0.361 Valid 2b 0.493 0.361 Valid 2c 0.461 0.361 Valid 3a 0.457 0.361 Valid 3b 0.415 0.361 Valid 3c 0.395 0.361 Valid Scoring uses the HOTS assessment rubric, which includes three levels of ability, namely: a. Analysing the ability to group data, identify patterns, and connect concepts; b. Evaluating the ability to assess the accuracy of strategies and provide logical reasons; and c. Creating the ability to design new steps or alternative solutions. This rubric ensures that assessment is conducted objectively and consistently between the pretest and posttest. Data analysis began by scoring the HOTS essay test using a rubric covering analysis (C4), evaluation (C5), and creation (C6), then converting the scores to final scores. The

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pretest and posttest data were then tested for normality using the Shapiro–Wilk test and tested for homogeneity using the Levene test as the basis for selecting the analysis technique [21]. The Shapiro–Wilk test was chosen because the sample sizes in each group were fewer than 50 students, making it more sensitive to detecting data normality. Because the normality test indicated the data were not normally distributed, the analysis of the difference in posttest scores between the experimental and control classes was conducted using the nonparametric Mann–Whitney U Test. Furthermore, the increase in HOTS ability was analysed using the N-Gain calculation to assess learning effectiveness. The analysis results were then interpreted descriptively using HOTS indicators to provide a comprehensive picture of the effect of applying the wordwall-assisted gamification method. 3. RESULTS AND

DISCUSSION 3.1. Results [1] The results of this study show an increase in students' HOTS abilities after implementing the Wordwall application-assisted gamification learning method in the experimental class. A descriptive analysis of the two test scores shows that the average score in the experimental class increased from 13.93 to 19.57, while the average score in the control class increased from 9.93 to 18.93. This increase is reinforced by the N-Gain calculation shown in Table 4. Table 4. N-Gain Results [21] for the Experimental and Control Classes Grade Pretest Average Posttest Average N-Gain Average Category Experimental 13,93 19,57 0,65 Currently Control 9,93 18,93 0,48 Currently From Table 4, the average N-Gain for the experimental class was 0.65 (categorised as moderate), while that for [1] the control class was 0.48 (also categorised as moderate). These values show that Wordwall gamified learning leads to greater HOTS improvement than conventional learning. Before conducting hypothesis testing, the data were tested for normality using the Shapiro–Wilk test. The results are shown in Table 5. Table 5. Uji Normality Shapiro-Wilk Tests of Normality Shapiro-Wilk Statistic Df Sig Eksperimental Class .869 30 .002 Control Class .895 30 .006 From Table 5, it is evident that both classes produced sig < 0.05, or the data were [5] not normally distributed. [2] Due to the non-fulfilment of the normality requirement, the Independent Samples t-Test could not be used, so the nonparametric Mann–Whitney U Test was performed.

https://doi.org/10.58421/gehu.v5i1.985 375 The normality test in this study uses the Shapiro–Wilk test because the sample size in each group is less than 50 students. Statistically, the Shapiro–Wilk test has higher sensitivity than the Kolmogorov–Smirnov test for detecting deviations in data distribution at [2] small sample sizes. Therefore, [15] the Shapiro–Wilk test is considered more appropriate for determining whether the assumption of data normality is met in this study. Table 6. Homogeneity Test Results (Levene's Test) Test of Homogeneity of Variance Levene Statistic df1 df2 Sig. Score Based on Mean 2.377 1 58 .129 Based on Median .587 1 58 .447 Based on Median and with adjusted df

.587 1 46.068 .447 Based on trimmed mean 2.231 1 58 .141 From Table 5, a sig Based on Mean of 0.129 > 0.05 was obtained. [1] This shows that the variance of the N-Gain data across both groups is homogeneous. Although the homogeneity test indicates that the variances of the data in both groups are homogeneous, the normality test shows that the data are not normally distributed. Therefore, the analysis of differences in HOTS ability improvement between the experimental and control classes cannot use parametric statistical tests. As an alternative, the Mann–Whitney [5] U Test, a nonparametric test, is used because it does not require normality and is suitable for comparing two independent groups. Table 7. [2] Results of the Mann–Whitney U Test Test Statistics Score Mann-Whitney U 311.500 Wilcoxon W 776.500 Z -2.048 Asymp. Sig. (2-tailed) .041 The result was 0.041 < 0.05. This indicates that there [19] is a significant difference in the improvement of HOTS abilities between students in both classes. Therefore, H_0 can be rejected and H_1accepted. 3.2. Discussion [2] The results of the study show a significant difference in HOTS improvement between students who learn using the wordwall-assisted gamification method and those who learn through conventional instruction. The higher posttest scores of [1] the experimental class, supported by higher N-Gain scores, indicate that Wordwall has a stronger effect on the development of analytical (C4), evaluative (C5), and creative (C6) skills. These findings are [4] in line with the research hypothesis that Wordwall gamification improves students' HOTS abilities. Thus, the research results directly support the basic concept [11] that gamification can increase student engagement, motivation, and cognitive activity at a higher level of thinking.

https://doi.org/10.58421/gehu.v5i1.985 376 Several factors can explain the higher improvement [1] in the experimental class. First, Wordwall offers visual stimuli, challenges, points, and time limits that encourage students to respond actively. This situation creates a fun, motivating, and competitive learning environment, thereby encouraging deeper thinking. Second, the game format requires students to quickly analyse questions, evaluate options, and develop strategies to solve them, so that each learning session becomes a high-level thinking exercise. Third, interactive learning helps students focus longer and reduces the boredom that usually arises in conventional learning methods. This study also has several advantages. The instruments used have undergone validation, making HOTS measurements more accurate and reliable. The gamified learning applied is relevant to 21st-century learning needs, which require technology integration while adapting to the learning styles of the digital generation. In addition, using Wordwall provides a flexible, adaptive learning experience. However, this study also has limitations, particularly regarding the reliability of the network and the technological devices students use. Some students experienced technical difficulties when accessing the game, which may have affected their learning experience. Furthermore, this study has not explored the longterm impact of gamification on HOTS. When compared to previous research, the results of this study are consistent with the findings of experts mentioned in the introduction, such as the studies by Salsabila [12] and Kusnadi [14], which states that gamification can increase motivation and independence in learning. The consistency of these results reinforces the effectiveness of gamification as a learning approach. No conflicting results were found compared with previous studies, so this research adds to the empirical evidence strengthening the literature on the effectiveness of gamification in improving HOTS. From a theoretical perspective, this research contributes to the development of interactive learning models that integrate game elements to develop higher-order thinking skills. From a practical perspective, this research has implications for teachers, suggesting that Wordwall can be an effective alternative learning strategy, especially in mathematics, which is often considered difficult and boring. With empirical evidence that gamification can improve HOTS, schools and teachers can consider using this technology more widely in everyday learning activities [25].

4. CONCLUSION

The Higher Order Thinking Skills (HOTS) of eighth-grade students at Harapan 3 Junior High School showed significant improvement after the implementation of gamified learning using the Wordwall application. This can be seen in the average pretest score of the experimental class, which was 13.93 and increased to 19.57 on the post-test, yielding an NGain of 0.65, which is in the moderate category. Improvements in abilities were also seen in each HOTS indicator according to Bloom's Revised Taxonomy. Indicator C4 (analysing) experienced the largest increase, reflected in students' ability to identify important information and determine the appropriate solution strategy. Indicator C5 (evaluating) also increased as students were able to compare and assess solutions more logically based on mathematical concepts. In addition, indicator C6 (creating) also showed progress, as

https://doi.org/10.58421/gehu.v5i1.985 evidenced by students' ability to develop new strategies or produce similar questions with different approaches. Overall, wordwall-assisted gamified learning improved students' critical, analytical, evaluative, and creative thinking skills. The results of the Mann-Whitney U Test showed a significance value of 0.000 < 0.05, indicating a significant difference in the increase in HOTS abilities between students who learn using Wordwall-assisted gamification and those who learn using conventional methods. Thus, the Wordwall-assisted gamification method has a positive, significant effect on students' HOTS abilities.

REFERENCES

[1] Sani, M. M. R., Meha, A. M., & Nenotek, S. A. (2020). Penerapan Model Siklus Belajar 5E Untuk Meningkatkan Kemampuan Berpikir Tingkat Tinggi (HOTS) Siswa di SMP Adhyaksa 2 Kupang Tahun Ajaran 2018/2019. Jurnal Sains Dan Edukasi Sains, 3(1), 15–23. https://doi.org/10.24246/juses.v3i1p15-23

[2] Abraham, I., Tjalla, A., & Indrajit, R. E. (2021). HOTS (High Order Thingking Skill) dalam Paedagogik Kritis. Jurnal Ilmu Sosial Dan Pendidikan, 5(3), 2598–9944. https://doi.org/10.36312/jisip.v5i3.2211/http

[3] Jasaputri, D., Rakhmawati, F., & Maysarah, S. (2023). Relevan: Jurnal Pendidikan Matematika Yayasan Amanah Nur Aman Pengembangan Instrumen Tes Hots Berbasis Pendekatan Etnomatematika Di Kelas Ix Smp N 1 Pakantan. 3(2).

[4] Wardani, N., & Siregar, T. J. (2023). Indonesian Journal of Science and Mathematics Education The Development Of Hots (Higher-Order Thinking Skills) Assessment Instrument Based On Numeration Literacy In Mathematics For Junior High School.

https://doi.org/10.24042/ijsme.v5i1.17433 [5] Maysarah, S., Armanto, D., Dewi, I., & Saragih, S. (2024). 16 Analysis of numeracy literacy skills in elementary school students. 13(1), 52–64. https://doi.org/10.30821/axiom.v13i1.16006 [6] Yusuf. (2024). 1 HOTS (High Order Thinking Skills): Pembelajaran & Evaluasi. UIN Mataram Press. CV. Pustaka Egaliter. https://pustakaegaliter.com/ [7] Maysarah, S., Saragih, S., & Napitupulu, E. (2023). Peningkatan Kemampuan Literasi Matematik 8 Dengan Menggunakan Model Project-Based Learning. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 12(1), 1536. https://doi.org/10.24127/ajpm.v12i1.6627 [8] Wahyuningsih, A., Sumardjoko, B., Minsih, A, D., & Widyasari, C. (2023). Lesson Plan for Elementary School Learning Based on 20 Higher Order Thinking Skills. Jurnal Ilmiah Sekolah Dasar, 7(1), 159–169. https://doi.org/10.23887/jisd.v7i1.56642 [9] Handayani, P. (2021). Study Literature 14 Applying Higher Order Thinking Skills (HOTS) Oriented Learning with the PBL Model. 4(5), 205–211. https://jurnal.uns.ac.id/shes [10] Melawati, Y., R, R., & N , N. (2022). A needs analysis of HOTS-based assessment instruments for elementary school mathematics learning. Asian 3 Journal of Educational Technology, 1(2), 90–95. https://doi.org/10.53402/ajet.v1i2.41 [11] Putri Harahap, R. A., & Hasibuan, E. K. (2023). Analisis Kemampuan Berpikir Kritis Matematis 9 Siswa Kelas VIII SMP Melalui Pendekatan Open- Ended pada Materi Sistem Persamaan Linear Dua Variabel. Jurnal Cendekia : Jurnal Pendidikan Matematika, 7(1), 874–888. https://doi.org/10.31004/cendekia.v7i1.2167 [12] Lubis, M. S., & Br Ginting, S. S. (2025). Development of a Mathematics Module Based on 1 HOTS Questions on Social Arithmetic Material. Jurnal Riset Pendidikan Matematika, 12(1). https://doi.org/10.21831/jrpm.v12i1.66161 [13] Salsabila, F., & Aslam, A. 22 (2022). Pengembangan Media Pembelajaran Berbasis Web Google Sites pada Pembelajaran IPA Sekolah Dasar. Jurnal Basicedu, 6(4), 6088–6096. https://doi.org/10.31004/basicedu.v6i4.3155 [14] Kusnadi, E., & Azzahra, S. A. (n.d.). Vol 12 No 2 : Juli 2024 JDPP 7 Penggunaan Media Pembelajaran Interaktif Berbasis Wordwall dalam Meningkatkan Motivasi Belajar Peserta Didik Pada Mata Pelajaran PPKn di MA Al Ikhlash Padakembang Tasikmalaya. https://journal.umpo.ac.id/index.php/dimensi/index

https://doi.org/10.58421/gehu.v5i1.985 378

[15] Sri Rezeki, P., & Maysarah, S. (2022). Perbedaan Kemampuan Pemecahan Masalah Dan Berpikir Kritis Menggunakan Whatsapp Dan Google Classroom. Yayasan Amanah Nur Aman, 2(3). https://yana.web.id/index.php/relevan

[16] Sugiyono.(2011). Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif. Bandung: Alfabeta.

[17] Lenaini, I. (2021). Teknik Pengambilan Sampel Purposive Dan Snowball Sampling. Historis : Jurnal Kajian, Penelitian Dan Pengembangan Pendidikan Sejarah, 6(1), 33–39. https://doi.org/10.31764/historis.v6i1.4075

[18] Sugiyono. (2013). Metode Penelitian Kuantitatif. Alfabeta.

[19] Jusuf, H. (2016). Penggunaan Gamifikasi dalam Proses Pembelajaran. In Jurnal TICOM (Vol. 5, Issue 1).

[20] Lubis, M. S., & Rangkuti, A. N. (2024). Analysis of Student's Mathematical Problem Solving Ability on HOTS Questions at MTS Ar-Raudhatul Hasanah Medan. In Jurnal Kependidikan (Vol. 13, Issue 2). https://jurnaldidaktika.org

[21] Mukhid, A. (2021). Metodologi Penelitian Pendekatan Kuantitatif. Surabaya : Jakad Media Publishing.

[22] Umami, N., Saleh, S., Khairani Hasibuan, E. (2022). Kemampuan Berpikir Kritis Dan Pemecahan Masalah. RELEVAN: JURNAL PENDIDIKAN MATEMATIKA Yayasan Amanah Nur Aman. 2(6).

[23] Agustina,W., Bambang, S., Anatri,D., Minsih, & Choiriyah,W. (2023). Lesson Plan for Elementary School Learning Based on Higher Order Thinking Skills. Jurnal Ilmiah Sekolah Dasar, 7(1), 159– 169. https://doi.org/10.23887/jisd.v7i1.56642

[24] Yustina, A.F., Yahfizham. (2023). Game Based Learning Matematika dengan Metode Squid Game dan Among us. Jurnal Cendikia: Jurnal Pendidikan Matematika, 7(1), 615-630.

[25] Maysarah, S., Armanto, D., Dewi, I., & Saragih, S. (2024). Analysis of numeracy literacy skills in elementary school students. 13(1), 52–64. https://doi.org/10.30821/axiom.v13i1.16006

Sources

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