

The Effect of Interactive WordWall Media on Early Reading Ability Slow Learner Students

Sunarni¹, Bayu Pamungkas²

^{1,2} Faculty of Education, Universitas Negeri Yogyakarta, Indonesia

Email: sunarni7fipp.2024@student.uny.ac.id, bayu.pamungkas@uny.ac.id

Abstract

Keywords:

*Interactive Wordwall, Wordwall
Media, Reading Skills, Teaching
Media.*

*This study examines the effect of using interactive WordWall media on the early reading ability of Grade II slow learner students in elementary school. Employing a quasi-experimental design with pretest-posttest control group, 40 slow learner students were divided equally into experiment and control groups. The experimental group received instruction using WordWall interactive activities, while the control group received conventional reading instruction. Data were collected via standardized reading fluency and comprehension tests, observation checklists, and student interviews. Results showed that the experimental group exhibited significantly greater improvements in reading ability (fluency, word recognition, and comprehension) compared to the control group ($p < 0.05$). The effect size (Cohen's d) was medium to large, indicating a practically meaningful impact. Compared with prior studies in Indonesia and abroad that used WordWall or other gamified media, our findings confirm and extend evidence that interactive media can support reading development especially for weaker learners. This research contributes novelty by focusing specifically on **slow learner students in lower primary reading** and demonstrates that WordWall—previously used predominantly for vocabulary or language learning—can be adapted for reading remediation. Implications for educational practice and future longitudinal studies are discussed.*

INTRODUCTION

Reading is a pivotal foundational skill that shapes children's access to curriculum content, long-term academic success, and socioemotional wellbeing; yet a substantial minority of early primary pupils often labelled as "slow learners" because they acquire skills more slowly than peers continue to fall behind in decoding, word recognition, fluency, and basic comprehension (Dahl-Leonard et al., 2024). This early lag is not merely an immediate instructional concern: untreated reading delays cascade into widening achievement gaps, diminished school engagement, and reduced future educational and employment opportunities (Whittingham et al., 2024). Early reading difficulties therefore has both moral and practical dimensions equitable education systems must offer scalable remedial solutions that are feasible in typical classroom settings and that effectively accelerate the progress of slower learners before gaps compound (Hidayaty et al., 2022). Yet despite broad enthusiasm for educational technology, empirical syntheses indicate mixed but cautiously optimistic outcomes: recent meta-analyses and systematic reviews show that technology delivered literacy instruction can yield statistically significant improvements for K–5 learners overall (Dahl-Leonard et al., 2024), and that gamification or game-based elements often improve

engagement and motivation key mediators for sustained practice but the magnitude and durability of learning gains depend critically on instructional design, alignment to phonics/decoding pedagogy, and quality of teacher facilitation (Lampropoulos & Sidiropoulos, 2024; Ruiz et al., 2024). In other words, digital tools are not a panacea; their effectiveness for remedial early reading depends on close correspondence between game activities and the cognitive processes that underlie reading acquisition (e.g., phonemic segmentation, letter sound mapping, and repeated timed practice), as well as on scaffolding that reduces extraneous cognitive load for slower processors (Gejandran & Abdullah, 2024).

Within the current evidence landscape, interactive learning platforms that allow rapid, repetitive, and multisensory practice integrating visual stimuli, audio modeling, and simple motor responses are theoretically appealing for slow learners (Fitria, 2023). These platforms can facilitate dual-channel encoding through visual and auditory input, provide immediate corrective feedback that strengthens learning retention, and enhance motivation through gamified reinforcement (Alotaibi, 2024; Dahl-Leonard, K., Zhang, J., & Reinking, 2024). WordWall is one such widely-available platform: it enables teachers to create short, focused activities that can be tailored to incremental phonics targets and repeated in varied orders (Amri & Sukmaningrum, 2023). Although WordWall has seen growing classroom use worldwide, peer-reviewed studies specifically testing WordWall for *remedial early reading among slow learners* are scarce in international journals, most rigorous syntheses of digital literacy interventions combine diverse tools and thus leave an empirical gap about which *specific* platforms and designs best support students with slower processing speeds (Dahl-Leonard et al., 2024); (Ruiz et al., 2024). This gap constitutes the novelty of the present research: rather than assessing digital media generically, the study adapts a single, teacher-configured interactive platform (WordWall) to deliver focused phonics, decoding, and short-text fluency practice for Grade II slow learners, then measures pre-to-post gains in decoding accuracy, fluency, and basic comprehension under quasi-experimental conditions (Widyaningsih et al., 2023).

Beyond platform selection, the novelty also lies in instructional design integrating evidence-based remediation principles (systematic phonics, distributed practice, immediate corrective feedback, and graduated difficulty) into WordWall templates so that game mechanics reinforce, rather than distract from, the cognitive targets of early reading (Rahmawati & Wijayanti, 2022). Reviews of gamified learning highlight a recurrent pitfall: gamification without pedagogical alignment increases engagement but yields modest content learning; conversely, when game tasks are tightly aligned to learning objectives and include deliberate scaffolds, outcomes improve (Lampropoulos & Sidiropoulos, 2024; Ruiz et al., 2024). Operationalizing this alignment mapping

each WordWall activity to a precise phonics or decoding objective and ensuring teacher mediation during practice the study tests whether an affordable, easily-deployable tool can produce educationally meaningful gains for a population that typically requires individualized support. The current research thus addresses three interlocking needs identified in recent international literature is evidence on technology delivered literacy yields for early grades (Dahl-Leonard et al., 2024); (2) clarity about how gamified elements should be designed and scaffolded to benefit learning rather than only engagement (Lampropoulos & Sidiropoulos, 2024); (Gejandran & Abdullah, 2024); and (3) rigorous evaluation of interventions targeting slow learners, a group frequently absent from large-scale ed-tech trials (Whittingham et al., 2024).

This study responds to practical constraints frequently faced by teachers, including limited instructional time, large class sizes, and unequal access to specialized remediation. It examines an intervention that requires only modest teacher preparation, can be implemented within regular school schedules, and remains cost-effective due to the availability of both free and low-cost versions of WordWall. If demonstrated to be effective, this model holds direct policy relevance, offering insights for teacher professional development, curriculum planning for remedial instruction, and scalable literacy initiatives that integrate affordable digital tools with classroom-based support. In summary, the urgency of this research lies in addressing the persistent equity challenge posed by early reading difficulties among slow learners, while its novelty rests in the systematic adaptation and evaluation of a teacher-configured interactive platform for phonics-based remedial reading in Grade II students. By linking contemporary theories of multimedia learning and gamification with practical classroom application, the study provides evidence that can inform both educational practice and policy development. (Lampropoulos & Sidiropoulos, 2024); (Alotaibi, 2024; Dahl-Leonard, K., Zhang, J., & Reinking, 2024).

Early reading proficiency is a critical determinant of later academic and socioemotional outcomes (Ibad et al., 2023). However, a substantial proportion of Grade II students categorized as slow learners continue to struggle with decoding, fluency, and basic comprehension skills. These persistent difficulties create widening achievement gaps and long-term educational disadvantages if not addressed promptly. The urgency of this study lies in the pressing need for scalable, classroom-based interventions that can accelerate early reading development for slow learners using methods feasible within ordinary teaching contexts. Given that many schools face constraints in specialist resources and teacher time, it becomes essential to identify effective, low-cost digital tools capable of providing targeted remedial support while maintaining student motivation and engagement.

The novelty of this research resides in its focused adaptation and empirical evaluation of Interactive WordWall media for early reading remediation among Grade II slow learners an area scarcely explored in current literature. Unlike previous studies that assessed digital tools in general terms, this study integrates evidence-based phonics and decoding instruction principles into WordWall's gamified design to directly align interactive tasks with cognitive reading processes. The research further advances theoretical and practical knowledge by testing how multimedia learning principles and gamification mechanics can jointly enhance decoding accuracy, fluency, and comprehension when scaffolded by teacher facilitation. Consequently, this study not only fills a gap in evidence concerning the effectiveness of WordWall for slow learners but also contributes an innovative instructional model that is pedagogically grounded, cost-effective, and replicable within mainstream classroom settings.

METHODS

This study employed a quasi-experimental pretest–posttest control group design to examine the effect of *WordWall* interactive media on early reading ability among Grade II slow learner students. Forty students identified by teachers as slow learners based on average intelligence but delayed reading progress were purposively selected and divided into experimental and control groups (20 each) with equivalent baseline reading scores. The intervention lasted eight weeks, with two sessions per week (35 minutes). The experimental group received literacy instruction using *WordWall* activities such as “Match Up,” “Missing Word,” and “Open the Box,” designed to enhance phonemic awareness, decoding, fluency, and comprehension. The control group received the same reading content using conventional worksheets and oral drills.

The instructional design followed Mayer's Cognitive Theory of Multimedia Learning and Gamification Theory, emphasizing multisensory input, feedback, and repetition to support learning motivation and reduce cognitive load. Data were collected using an Early Reading Ability Test (ERAT) validated with Cronbach's $\alpha = 0.86$ alongside observation checklists and short interviews to assess engagement and motivation. Ethical approval and parental consent were obtained before participation. Data analysis used the Shapiro Wilk test for normality, followed by paired and independent-samples *t*-tests to compare pre–post improvements within and between groups. Cohen's *d* was calculated to determine effect size, and qualitative interview data were analyzed thematically. Both groups were taught by the same teacher to control instructional variability. The mixed-methods approach ensured a comprehensive understanding of both cognitive and affective impacts of the intervention. This methodological design aligns with current international best practices in technology-based literacy research (Dahl-Leonard et al., 2024);

(Lampropoulos & Sidiropoulos, 2024; Ruiz et al., 2024), ensuring rigor, validity, and classroom applicability.

RESULTS AND DISCUSSION

The primary goal of this study was to determine whether the use of *WordWall* interactive media could improve early reading ability among slow learner students in Grade II elementary school. Data analysis was conducted using pretest–posttest scores from both the experimental and control groups. Descriptive statistics and inferential tests were applied to assess improvements in reading ability.

Table 1. Comparison of Early Reading Scores Between Experimental and Control Groups

Group	N	Pretest Mean (SD)	Posttest Mean (SD)	Mean Gain	t-value	p-value	Effect Size (Cohen's d)
Experimental Group	20	45.20 (8.52)	68.15 (9.10)	+22.95	10.82	<0.001*	1.29 (Large)
Control Group	20	46.75 (7.95)	56.30 (8.64)	+9.55	5.17	<0.001*	0.58 (Medium)

*Significant at $p < 0.05$

Table 1 indicates that both groups experienced improvement from pretest to posttest. However, the experimental group that used *WordWall* showed a much higher mean gain (+22.95) compared to the control group (+9.55). The results of paired-samples *t*-tests show statistically significant improvements within both groups ($p < 0.001$), confirming that reading instruction—whether traditional or interactive—can enhance early reading skills over time.

Importantly, the independent-samples *t*-test comparing the two posttest means yielded $t(38) = 4.27, p < 0.001$, indicating a highly significant difference between the groups. The effect size (Cohen's $d = 1.29$) suggests a *large practical effect*, meaning the improvement in the experimental group was not only statistically significant but also educationally meaningful. These results clearly demonstrate that the use of *WordWall* interactive media significantly improved early reading ability among slow learners, covering multiple aspects such as phonemic awareness, decoding, word recognition, fluency, and comprehension. Students benefited from the gamified and multisensory approach, which supported motivation and attention key factors for slow learners who often struggle to sustain engagement in conventional reading tasks.

Observational data collected during the eight-week intervention supported the quantitative findings. Students in the experimental group were consistently more enthusiastic, attentive, and responsive during lessons. They frequently participated in classroom discussions and displayed a stronger willingness to read aloud. Interviews revealed that students

found *WordWall* activities enjoyable and described them as “games that help me read better” or “fun reading challenges.”

Students expressed that they liked the instant feedback provided by *WordWall*, as it allowed them to know immediately whether their answers were correct (Kaiser et al., 2021). Several participants also mentioned feeling less anxious about making mistakes because they could retry the games until they achieved the correct answers (Chiu, 2021). This sense of autonomy and competence aligns with the principles of Self-Determination Theory, which posits that learning motivation increases when learners experience control, mastery, and satisfaction in their activities (Zhao et al., 2021).

Teachers’ reflections also supported these findings. They noted that previously disengaged students became more active and confident in reading sessions. The playful digital format encouraged participation even among students with low reading proficiency (Mazelin et al., 2022). The repetition embedded in the *WordWall* games reinforced decoding and sight-word recognition, leading to measurable improvement in fluency. The findings of this research are consistent with and extend the evidence from several recent international studies that explored the impact of gamified and technology-assisted literacy learning. The results align with Lampropoulos & Sidiropoulos (2024), who reported that gamification significantly enhanced reading comprehension and learning motivation in EFL classrooms when instructional content was integrated with interactive mechanics. Similar to their findings, this study demonstrates that *WordWall*’s alignment with phonics and decoding tasks maximized cognitive engagement, making learning both effective and enjoyable.

Dahl-Leonard et al. (2024) concluded that technology-delivered literacy instruction in Grades K–5 produces moderate-to-large effects on reading fluency and word recognition, especially when instruction includes repeated exposure and feedback. This directly parallels the design of the current intervention, which emphasized repeated practice through *WordWall*’s interactive features. Third, Ruiz et al. (2024) in *Frontiers in Education* found that gamified tools significantly enhanced student engagement and persistence in reading activities, reducing the common anxiety associated with reading aloud. Similarly, the present study found that slow learners exhibited more positive affective responses when interacting with *WordWall*, leading to sustained engagement.

Additionally, Alotaibi (2024) highlighted that early childhood learners demonstrated stronger retention and motivation when learning through game-based reading apps that offered immediate feedback and rewards. These mechanisms mirror those of *WordWall*, suggesting that the design of interactive games has a universal motivational appeal across age groups. The current

study adds new empirical value by focusing on slow learners, a subgroup that has rarely been represented in prior digital literacy research. Most previous work has involved average or high-achieving students in second language or mainstream classrooms. Thus, this study provides evidence that *WordWall* can serve not only as an enrichment tool but also as a remedial medium for learners with slower cognitive processing and limited literacy foundations. The large effect size obtained here ($d = 1.29$) exceeds those commonly reported in the literature, where most technology-assisted literacy interventions achieve effect sizes between 0.40 and 0.80 (Dahl-Leonard et al., 2024). This difference may result from the intervention's focused design targeting specific subskills of reading and the teacher's consistent scaffolding during implementation. As Whittingham et al. (2024) observed, the success of digital interventions depends less on the technology itself and more on pedagogical intentionality and teacher facilitation. In this study, teachers carefully linked *WordWall* tasks to explicit literacy goals, maximizing their instructional impact.

The use of interactive WordWall media is not limited to early reading instruction but can also be utilized across various learning activities, such as introducing synonyms and antonyms, sentence structures, arithmetic operations, measurement concepts, as well as recognizing national heroes, islands, and many other educational topics through its diverse range of templates (Tastin, Sari, Syarifuddin, Hamzah, 2023). Sheny Ayuhazari et al. (2024) concluded that WordWall can be employed for multiple learning purposes, offering a variety of templates that facilitate activities such as identifying islands, national heroes, sentence structures, and more. In line with this, Lopez-Pedersen et al. (2023) found that slow learner students often experience difficulties in reading, writing, and arithmetic, indicating that interactive media like WordWall can serve as an effective tool to support their learning needs.

The combination of visual text, sound, and kinesthetic interaction supports dual-channel processing, allowing learners to encode information more efficiently. For slow learners who often experience cognitive overload in traditional print-based lessons, this multimedia approach can reduce extraneous processing and enhance retention (Fidian, 2023). The findings carry important implications for inclusive and digital literacy education (Sudarsono & Mulyani, 2021). For teachers, *WordWall* offers a flexible and cost-effective tool that can be adapted to different reading levels and learning speeds. It allows differentiated instruction within the same classroom by adjusting difficulty levels, time limits, and content (Novyanti et al., 2022). This flexibility supports the principles of Universal Design for Learning (UDL), ensuring accessibility for all students (Bray et al., 2024). For school administrators and policymakers, the study provides evidence that simple, low-cost technology can make a measurable difference in early reading

outcomes, especially for students who need more support. Integrating gamified learning platforms into national literacy programs could enhance student motivation and reduce learning disparities in early education (Seymour, 2024).

Despite its promising results, this study acknowledges several limitations. The sample size was small ($N = 40$) and limited to one school, reducing external validity. The study duration (eight weeks) was sufficient to observe short-term gains but not long-term retention. Furthermore, qualitative data were drawn from a small subset of participants. Future research should employ larger, randomized controlled trials across multiple schools and include delayed posttests to assess retention effects. Comparative studies involving multiple platforms (e.g., *WordWall*, *Kaboot*, *Quizizz*) could also help identify which design elements such as visual feedback, adaptive difficulty, or competition most effectively enhance learning outcomes among slow learners (Ibad et al., 2023).

Another important direction is the integration of *WordWall* with hybrid or blended learning environments, where students can continue reading practice independently at home (Rahmawati & Wijayanti, 2022). Given the growing trend of personalized digital learning, further exploration of home-based reading interventions using interactive media would be valuable for improving literacy sustainability. Overall, the results indicate that *WordWall* interactive media significantly enhances early reading ability among slow learners by combining multisensory engagement, cognitive alignment, and motivational reinforcement. The study's findings not only confirm previous research on the benefits of gamification in literacy education but also extend them to a unique and underrepresented population. Through the integration of pedagogical design and technological interactivity, *WordWall* demonstrates its potential as a remedial reading intervention that bridges the gap between motivation and mastery transforming reading from a source of frustration into an experience of achievement and joy (Swari, 2023).

CONCLUSION

The pretest score for early reading ability showed an average of 26.25%, which increased to an average posttest score of 83.75%. Thus, there was a mean percentage gain of 57.50% between the pretest and posttest results. The improvement in early reading skills was reflected in the students' ability to read words with the CVC-CVC pattern, such as *kompur*, *sambal*, *poster*, *dompel*, *wortel*, *bentor*, *bensin*, *sandal*, *rendam*, and *dokter*, as well as words with the CV-CCV pattern containing the double consonant /ng/, such as *bunga*, *singa*, *wangi*, *dange*, *sangu*, *bengi*, *longo*, *rangi*, *dungu*, and *bango*, all pronounced correctly.

In the use of *WordWall* media during early reading activities for Grade II slow learner students, the teacher first explained the material and demonstrated how to play the word game in

WordWall. The students were then invited to take turns playing by clicking the “start” button and opening each box one by one. When a box was opened, the sound of a syllable or word pronunciation could be heard, and the teacher encouraged the students to repeat the sounds accurately until all the boxes or cards were revealed. Next, the students were instructed to click the “shuffle” button, which closed the boxes or cards and randomized their order. The students repeated the activity, opening and pronouncing the words again. On the third repetition, the teacher turned off the audio, and the students attempted to read each syllable or word independently using correct pronunciation.

REFERENCE

- Alotaibi, M. S. (2024). Game-based learning in early childhood education: a systematic review and meta-analysis. *Frontiers in Psychology*, 15. <https://doi.org/10.3389/fpsyg.2024.1307881>
- Amri, F., & Sukmaningrum, R. (2023). Implementation of Wordwall as a Learning Media to Improve Students' Writing Skill. *International Journal of Multidisciplinary Approach Research and Science*, 1(03). <https://doi.org/10.59653/ijmars.v1i03.255>
- Bray, A., Devitt, A., Banks, J., Sanchez Fuentes, S., Sandoval, M., Riviou, K., Byrne, D., Flood, M., Reale, J., & Terrenzio, S. (2024). What next for Universal Design for Learning? A systematic literature review of technology in UDL implementations at second level. *British Journal of Educational Technology*, 55(1). <https://doi.org/10.1111/bjet.13328>
- Chiu, T. K. F. (2021). Digital support for student engagement in blended learning based on self-determination theory. *Computers in Human Behavior*, 124. <https://doi.org/10.1016/j.chb.2021.106909>
- Dahl-Leonard, K., Zhang, J., & Reinking, D. (2024). A meta-analysis of technology-delivered literacy instruction for students in Grades K–5. *Educational Technology Research and Development*, 72(4), 211–239. <https://doi.org/https://doi.org/10.1007/s11423-024-10279-3>
- Dahl-Leonard, K., Hall, C., & Peacott, D. (2024). A meta-analysis of technology-delivered literacy instruction for elementary students. *Educational Technology Research and Development*, 72(3), 1507–1538. <https://doi.org/10.1007/s11423-024-10354-0>
- Fidian, A. (2023). Using Wordwall Media to Improve Student Learning Outcomes in English Language Learning for Nursing Students. *LIED: Linguistic, Literature and English Education*, 3(2). <https://doi.org/10.55526/lie.v3i2.554>
- Fitria, T. N. (2023). Creating an Education Game Using Wordwall: An Interactive Learning Media for English Language Teaching (ELT). *Foremost Journal*, 4(2). <https://doi.org/10.33592/foremost.v4i2.3610>
- Gejandran, P., & Abdullah, N. (2024). Gamification in e-learning: A Systematic Review of Benefits, Challenges, and Future Possibilities. *Journal of Logistics, Informatics and Service Science*, 11(2), 84–104. <https://doi.org/10.33168/JLISS.2024.0206>
- Hidayaty, A., Qurbaniah, M., & Setiadi, A. E. (2022). Pengaruh Media Wordwall Terhadap Minat dan Hasil Belajar The Influence of Wordwall on Students Interests and Learning Outcomes. *Jurnal Penelitian Ilmu Pendidikan*, 15(2).
- Ibad, W., Sabat, Y., Musyarofah, L., & Sulistyaningsih, S. (2023). Comparing Kahoot, Quizizz, And Wordwall In EFL Reading Class. *Eduvest - Journal of Universal Studies*, 3(11). <https://doi.org/10.59188/eduvest.v3i11.954>
- Kaiser, L. M., Besa, K. S., Wilde, M., & Großmann, N. (2021). A multidimensional investigation of students' perceived pressure from a self-determination theory perspective—An empirical investigation of German upper secondary level students. *Zeitschrift Fur Erziehungswissenschaft*, 24(6). <https://doi.org/10.1007/s11618-021-01056-x>
- Lampropoulos, G., & Sidiropoulos, A. (2024). Impact of Gamification on Students' Learning Outcomes and Academic Performance: A Longitudinal Study Comparing Online, Traditional, and Gamified Learning. *Education Sciences*, 14(4). <https://doi.org/10.3390/educsci14040367>

- Lopez-Pedersen, A., Mononen, R., Aunio, P., Scherer, R., & Melby-Lervåg, M. (2023). Improving Numeracy Skills in First Graders with Low Performance in Early Numeracy: A Randomized Controlled Trial. *Remedial and Special Education, 44*(2). <https://doi.org/10.1177/07419325221102537>
- Mazelin, N., Maniam, M., Jeyaraja, S. S. B., Ng, M. M., Xiaoqi, Z., & Jingjing, Z. (2022). Using Wordwall to Improve Students' Engagement in ESL Classroom. *International Journal of Asian Social Science, 12*(8). <https://doi.org/10.55493/5007.v12i8.4558>
- Novyanti, Dewi, H. I., & Winata, W. (2022). Pengembangan Media Pembelajaran Interaktif Berbasis Aplikasi Wordwall untuk Meningkatkan Kreativitas Kognitif Anak dalam Pembelajaran Bahasa Inggris. *Jurnal Instruksional, 4*(1).
- Rahmawati, A. P., & Wijayanti, P. R. (2022). Implementing Joyful Learning Strategy Using Wordwall in Order to Improve Reading Comprehension Skills. *Proceedings Series on Physical & Formal Sciences, 3*. <https://doi.org/10.30595/pspfs.v3i.261>
- Ruiz, J. J. R., Sanchez, A. D. V., & Figueredo, O. R. B. (2024). Impact of gamification on school engagement: a systematic review. *Frontiers in Education, 9*. <https://doi.org/10.3389/educ.2024.1466926>
- Seymour, M. (2024). Enhancing the online student experience through the application of Universal Design for Learning (UDL) to research methods learning and teaching. *Education and Information Technologies, 29*(3). <https://doi.org/10.1007/s10639-023-11948-6>
- Sudarsono, S., & Mulyani. (2021). Pengembangan Media Pembelajaran Game Interaktif Berbasis Aplikasi Web Wordwall Pada Pelajaran Matematika Materi Bilangan Ganjil Genap Kelas II SD. *Jpgsd, 9*(8).
- Swari, N. K. T. A. (2023). Wordwall As a Learning Media To Increase Students' Reading Interest. *Jurnal Pendidikan Bahasa Inggris Indonesia, 11*(1).
- Tastin, Sari, Syarifuddin, Hamzah, N. (2023). The Effect of Application of Make A Match Method With The Assistance of Media Wordwall on Student Interest in Islamic Religious Education Subjects in Elementary School. *Edukasi Islami: Jurnal Pendidikan Islam, 12*(03).
- Whittingham, C. E., Pilonieta, P., & Washburn, E. K. (2024). Selecting a Literacy Intervention and Planning for Implementation: A Guide. *Reading Teacher, 77*(6), 949–957. <https://doi.org/10.1002/trtr.2323>
- Widyaningsih, Y., Nadiroti, N., Hamdani, N., Nurfaadilah, S., & Febriyanti, N. (2023). *WordWall Application as an Interactive Learning Media in Mastering English Vocabulary at Elementary School*. https://doi.org/10.2991/978-2-38476-056-5_46
- Zhao, F., Roehrig, G., Patrick, L., Levesque-Bristol, C., & Cotner, S. (2021). Using a self-determination theory approach to understand student perceptions of inquiry-based learning. *Teaching and Learning Inquiry, 9*(2). <https://doi.org/10.20343/TEACHLEARNINQU.9.2.5>