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The Effect of The Problem-Based Learning Model Assisted by Wordwall Media on Students' Activeness in Indonesian Language Learning

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ABSTRACT

This study aims to determine the effect of the Problem Based Learning (PBL) model assisted by Wordwall media on the learning activeness and learning outcomes of third-grade students at SD Negeri 28 Kelakik. The research employed a quantitative approach with a pre-experimental design using a one-group Pretest-Posttest design. The sample consisted of 20 students selected through total sampling technique. The research instruments included multiple-choice tests, observation sheets of student activeness, interviews, and documentation. Data analysis was conducted using normality test, paired sample t-test, and N-Gain analysis. The results showed that the data were normally distributed, and there was a significant effect of the PBL model assisted by Wordwall on learning outcomes (Sig. 0.000 < 0.05). The N-Gain value was categorized as moderate (0.63). The average student score increased from 58 to 84. Therefore, it can be concluded that the PBL model assisted by Wordwall is effective in improving students' activeness and learning outcomes.

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1. Introduction

Learning problems in Indonesia are still characterized by the dominance of less varied and monotonous teaching methods. This condition indicates that classroom learning practices have not fully accommodated the diverse learning needs of students. Less innovative learning has an impact on the low level of student engagement in the learning process and the decline in the quality of learning outcomes. This shows that efforts are needed to improve the quality of learning, particularly in encouraging student activeness as part of a meaningful learning process.

Pedagogically, teacher-centered learning remains the dominant practice in classrooms. This condition causes students to act more as recipients of information rather than as subjects of learning. As a result, students' learning activities tend to be passive and are not yet able to encourage deep cognitive engagement. Learning that only emphasizes the delivery of material without actively involving students has an impact on low conceptual understanding and the underdevelopment of higher-order thinking skills. Therefore, a learning model that is capable of optimally activating students is needed. One learning model that can be used to increase

student activeness is Problem-Based Learning (PBL). This model emphasizes the use of contextual problems as learning stimuli, thereby encouraging students to think critically and actively engage in the problem-solving process. PBL has been proven to improve critical thinking skills, conceptual understanding, and student engagement in learning. In addition, the implementation of PBL can create a more interactive and meaningful learning atmosphere because students are directly involved in the process of knowledge construction.

However, the implementation of PBL in learning is not free from challenges. Students often experience difficulties in understanding problems at the initial stage of learning and require more time in the problem-solving process. Therefore, supporting strategies are needed to help increase the effectiveness of PBL implementation in the classroom. One strategy that can be applied is the integration of digital technology-based learning media.

In the context of 21st-century learning, the use of interactive digital media has become one alternative to increase student engagement. One medium that can be utilized is Wordwall, which provides various game-based (gamification) features, making learning more interesting. The use of Wordwall has been proven to increase students' motivation, participation, and activeness. In addition, the integration of Wordwall in PBL-based learning can also help students understand the material more easily and enjoyably (Marniati et al., 2024).

Previous studies have shown that the combination of the PBL model and Wordwall media has great potential to improve the quality of learning. The implementation of PBL assisted by Wordwall has been proven to significantly improve students' learning outcomes and conceptual understanding (Ayunopiasari et al., 2024; Hidayah & Aeni, 2025). However, most studies still focus on learning outcomes, while student activeness as an indicator of the learning process has not been widely examined in depth.

Based on the empirical studies described above, there appears to be a research gap in studies related to Problem-Based Learning (PBL) assisted by Wordwall media on student activeness, particularly in the use of Wordwall. Most previous studies have tended to focus on cognitive learning outcomes. Therefore, this study aims to examine the effect of implementing the Problem-Based Learning (PBL) model assisted by Wordwall media on students' activeness in Indonesian language learning. This study is expected to provide an empirical contribution to the development of innovative learning that is not only oriented toward learning outcomes but also toward the quality of the learning process.

2. Research Methodology

This study employed a quantitative approach with a pre-experimental research design. The research design used was the *one-group pretest-posttest design*, which involves conducting research on a single group without a control group by providing treatment in the form of implementing the *Problem-Based Learning* (PBL) model assisted by *Wordwall* media. This design aimed to determine changes in students' activeness and learning outcomes before and after the treatment.

The study was conducted at SD Negeri 28 Kelakik during the even semester of the 2025/2026 academic year. The population of this study consisted of all third-grade students, totaling 20 students. The sampling technique used was total sampling, meaning that the entire population was used as the research sample. The variables in this study consisted of independent and dependent variables. The independent variable was the *Problem-Based Learning* (PBL) model assisted by *Wordwall* media, while the dependent variables included students' activeness and learning outcomes in the Indonesian language subject. Students' activeness was measured through indicators such as participation in discussions, asking questions, answering questions,

and involvement in learning activities. Learning outcomes were measured through cognitive tests that included the ability to understand and apply learning materials. In general, the research procedures consisted of several stages, namely problem identification, formulation of research problems, and determination of research objectives.

The research instruments used included learning outcome tests, observation sheets of students' activeness, and documentation. The learning outcome test was in the form of multiple-choice questions arranged based on learning indicators. Observation sheets were used to measure the level of students' activeness during the learning process, while documentation was used to complement the research data.

Before being used, the research instruments were first tested for validity through *expert judgment* by lecturers acting as validators. This validation aimed to assess the suitability of the instrument contents with the learning indicators and the feasibility of using the instruments in the research. The validation results were used as the basis for revising the instruments to make them more representative and aligned with the research objectives. After being declared feasible by the validators, the instruments were used in the data collection process.

Data collection techniques were carried out through three stages, namely *pretest*, treatment, and *posttest*. The *pretest* was administered to determine students' initial abilities before the implementation of the PBL model assisted by *Wordwall*. Furthermore, the treatment was conducted through the implementation of the PBL model with the assistance of *Wordwall* media in several meetings. After the treatment, a *posttest* was conducted to determine students' learning outcomes after participating in the learning process.

The data analysis technique was conducted quantitatively using statistical tests. The analysis began with a normality test to determine the distribution of the data. Furthermore, a *paired sample t-test* was conducted to determine the differences in students' activeness before and after the treatment. In addition, *N-Gain* analysis was used to determine the level of students' activeness after the treatment was given. The results of the analysis showed that the increase in students' activeness was categorized into low, moderate, and high categories according to the *N-Gain* values obtained by each student.

3. Findings

The results of the study showed a fairly significant improvement in students' activeness and learning outcomes after the implementation of the Problem-Based Learning model assisted by *Wordwall* media. The improvement was evident from the students' pretest and posttest results. Based on the *N-Gain* analysis, the increase in students' activeness was categorized as moderate to high. In addition, students' activeness during the learning process also increased, such as their courage to ask questions, group collaboration, and participation in completing learning tasks. These activities were reflected in students' involvement in asking and answering questions, participating in discussions, expressing opinions, and using the *Wordwall* media. The distribution of students' activeness is presented in the following table.

Table 1. Distribution of Students' Activeness

Activeness Category	Number of Students	Percentage
Very Active	7	35%
Active	7	35%
Moderately Active	6	30%
Less Active	0	0%
Total	20	100%

Based on the table above, it can be seen that 70% of students were categorized as active to very active. This condition indicates that the implemented learning process was able to create an interactive and collaborative learning atmosphere while encouraging equal student participation. The dominance of the active category also indicates that students not only received information passively, but were also involved in thinking processes, discussions, and problem-solving activities.

In terms of learning outcomes, there was a significant improvement before and after the treatment. The comparison of students' pretest and posttest scores can be seen in the following table.

Table 2. Students' Pretest and Posttest Results

Test Stage	Average Score	Category	Difference
Pretest	58	Fair	
Posttest	84	Good	+26

The increase of 26 points indicates an improvement in students' understanding of the learning material after the implementation of the PBL model assisted by *Wordwall*. Almost all students experienced an increase in scores, indicating that the learning process had an equal impact and did not only affect a small number of students.

Before conducting the hypothesis test, the data were first tested for normality using the Shapiro-Wilk test. The results of the normality test are presented in the following table.

Table 3. Results of the Shapiro-Wilk Normality Test

Data	Sig.	Description
Pretest	0.175 (>0.05)	Normal
Posttest	0.150 (>0.05)	Normal

The test results showed that the significance values were greater than 0.05, indicating that the pretest and posttest data were normally distributed. This means that the data met the requirements for conducting parametric tests. Furthermore, hypothesis testing was carried out using the *Paired Sample t-Test* to determine the effect of the treatment on students' learning outcomes.

Table 4. Results of the Paired Sample t-Test

Variable	Sig. (2-tailed)	α	Decision
Pretest–Posttest	0.000	0.05	H_0 Rejected

The test results showed a significance value of 0.000 < 0.05, meaning that H_0 was rejected and H_1 was accepted. This indicates that there was a significant effect of the Problem-Based Learning model assisted by *Wordwall* on the learning outcomes of third-grade students at SD Negeri 28 Kelakik. Statistically, these results indicate that the improvement in students' scores did not occur by chance, but was a direct impact of the implementation of the learning model used.

The analysis of learning outcome improvement was also conducted using the *N-Gain Score* to determine the level of learning effectiveness.

Table 5. Results of the N-Gain Score Analysis

Indicator	Score	Category
Average N-Gain	0.63	Moderate

The *N-Gain* score of 0.63 indicates that the improvement in learning outcomes was categorized as moderate. This finding suggests that the implementation of the PBL model assisted by *Wordwall* was quite effective in improving students' learning outcomes, although it could still be enhanced through the optimization of learning strategies and the use of more varied digital media.

Overall, the results of the study indicate a consistent relationship between students' activeness and the improvement of learning outcomes. Students who were more active during the learning process tended to have a better understanding of the material being studied. This finding demonstrates that problem-based learning provides opportunities for students to think critically, collaborate, and solve problems actively. In addition, the use of *Wordwall* media contributed to creating a more engaging, interactive, and enjoyable learning atmosphere. This media helped increase students' motivation and focus, making the learning process more meaningful and effective.

4. Discussion

The results of the study indicate that the implementation of the Problem-Based Learning (PBL) model assisted by *Wordwall* media had a positive impact on students' activeness and learning outcomes. Students' activeness demonstrates that the implemented learning process was able to create a student-centered learning environment, enabling students to actively engage in the learning process both cognitively and socially. Conceptually, this condition reflects a shift in roles from the teacher as the primary source of information to a facilitator of learning, while students become the main subjects who construct their own knowledge through interaction and learning experiences.

The increase in students' activeness is consistent with the findings of Sailer and Homner (2020), who stated that the implementation of gamification in learning has positive effects on students' engagement and learning motivation. Gamification encourages active participation through elements such as challenges, points, and direct feedback. In the context of this study, the use of *Wordwall* as a game-based learning medium strengthened students' engagement by providing interactive and enjoyable learning experiences. Furthermore, this engagement was not only behavioral engagement, but also included cognitive engagement, where students were encouraged to think, respond, and make decisions during the learning process. This explains why students were not only physically active, but also demonstrated deeper mental involvement.

Students' activeness also indicates a substantial shift in students' conceptual mastery. Therefore, it should not merely be interpreted as an increase in scores, but rather as an indication of cognitive transformation among students, from the dominance of recall abilities toward understanding and application of concepts. Conceptually, this achievement indicates that the learning process successfully facilitated more meaningful knowledge construction rather than merely transferring information.

This effectiveness is closely related to the characteristics of Problem-Based Learning (PBL), which places contextual problems as the primary trigger of students' cognitive activities.

Balemen and Yenice (2021) emphasized that PBL is more effective than conventional learning in improving students' activeness because it encourages active involvement in the inquiry process. Furthermore, Asmiyunda and Hardeli (2023), through a meta-analysis, showed that PBL not only has a significant impact on learning outcomes but also consistently improves critical thinking skills through mechanisms of analysis, synthesis, and evaluation. Therefore, the increase in students' activeness in this study can be positioned as a logical consequence of the facilitation of higher-order thinking skills (HOTS), which are the main indicators of successful 21st-century learning.

However, the effectiveness of PBL in this study did not stand alone, but was strengthened by the integration of gamification-based digital media, namely *Wordwall*. This integration is important to highlight because one criticism of PBL implementation is the potential lack of student engagement if it is not supported by attractive learning stimuli. In this context, Sari et al. (2022) demonstrated that technology-based gamification has a significant impact on increasing motivation and learning engagement, which ultimately contributes to academic performance. *Wordwall* functions as a cognitive engagement trigger capable of increasing students' attention and interest in learning. From a cognitive perspective, this increased attention directly affects the optimization of working memory capacity in processing information, thereby increasing the possibility of deeper encoding (*deep processing*). In other words, *Wordwall* not only serves as a supporting medium, but also as a strategic component that strengthens the effectiveness of PBL.

From an inferential perspective, the significance value of 0.000 (< 0.05) provides strong empirical evidence that the improvement in learning outcomes was not a random phenomenon, but rather a direct result of the implemented learning intervention. This indicates that the learning model possesses sufficient explanatory power regarding learning outcome variables. In addition, the *N-Gain* value of 0.63, which falls into the moderate category, should be interpreted critically. On the one hand, this value indicates that the intervention was effective and substantial. On the other hand, it also suggests that the potential for improvement has not yet been fully optimized. This opens room for interpretation that the implementation of PBL assisted by *Wordwall* still requires reinforcement, for example through the optimization of scaffolding, the implementation of differentiated learning, or increasing the complexity of the problems provided to make them more cognitively challenging.

Furthermore, the findings of this study confirm a strong relationship between students' activeness and learning outcomes. This relationship can be explained through the *depth of processing theory*, which states that the quality of learning is determined by the extent to which individuals are actively involved in processing information. Students who are actively engaged tend to elaborate, organize, and integrate information, thereby producing more stable and meaningful knowledge representations. In this context, PBL acts as an instructional framework that encourages cognitive and social engagement, while *Wordwall* serves as an engagement enhancer that maintains the intensity of students' participation throughout the learning process.

Therefore, the main contribution of this study lies not only in the quantitative improvement of students' activeness, but also in strengthening empirical evidence that the integration of the PBL model with digital gamification media is an effective approach to developing student-centered, interactive learning oriented toward the development of higher-order thinking skills. These findings also reinforce the urgency of pedagogical transformation toward learning that is adaptive to the demands of the 21st century.

5. Conclusion

Based on the results of the study, it can be concluded that the implementation of the Problem-Based Learning (PBL) model assisted by *Wordwall* media had a significant effect on students' activeness and learning outcomes. This was indicated by the increase in the average score from 58 to 84, as well as the results of the *paired sample t-test*, which showed a significance value of 0.000 (< 0.05). In addition, the *N-Gain* value of 0.63 was categorized as moderate, indicating that the learning process was sufficiently effective in improving students' understanding. Students' activeness, which was dominated by the active and very active categories, demonstrates that the learning process was able to create an interactive and student-centered learning environment. Therefore, the use of the PBL model combined with *Wordwall* media can serve as an effective learning alternative in improving students' activeness.

References

Arikunto, S. (2019). *Prosedur penelitian: Suatu pendekatan praktik*. Rineka Cipta.

Asmiyunda, A., & Hardeli, H. (2023). The effect of Problem-Based Learning (PBL) on learning outcomes: Meta-analysis. *Pedagogia, 21*(2), 161–172. https://doi.org/10.17509/pdgia.v21i2.65061

Ayunopiasari, A., Pratiwi, V. U., & Antana, A. S. (2024). Meningkatkan hasil belajar peserta didik dengan model pembelajaran Problem Based Learning berbantu media Wordwall pada mata pelajaran IPAS kelas IV SD Negeri Pengkol 01. *Jurnal Pendidikan Tambusai, 8*(2), 35986–35989. https://jptam.org/index.php/jptam/article/view/19339

Balemen, N., & Yenice, N. (2021). The effect of Problem-Based Learning on students' achievement: A meta-analysis study. *International Journal of Curriculum and Instruction, 13*(1), 1–17. 10.15390/EB.2015.4429

Creswell, J. W. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Herdiansa, R. H., & Putra, L. V. (2024). Pengaruh model pembelajaran Problem Based Learning berbantuan permainan Wordwall terhadap kemampuan pemecahan masalah matematika siswa kelas V. *Jurnal Basicedu, 8*(4). https://doi.org/10.31004/basicedu.v8i4.8247

Hidayah, S. R., & Aeni, K. (2025). Keefektifan Problem Based Learning berbantuan Wordwall ditinjau dari pembelajaran berdiferensiasi dan hasil belajar siswa sekolah dasar. *Pedagogik: Journal of Islamic Elementary School, 9*(1). https://doi.org/10.24256/pijies.v9i1.10035

Jannah, M., Pravitasari, A. P., Astuti, Y. D., Utami, R. D., & Surapti. (2025). Peningkatan keaktifan siswa kelas III sekolah dasar pada pembelajaran IPAS melalui media interaktif Wordwall. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 10*(1), 1639–1651. https://journal.unpas.ac.id/index.php/pendas/article/view/23144

Marniati, M., Tahir, M., & Rahmatih, A. N. (2024). Pengaruh model pembelajaran Problem Based Learning berbantuan media Wordwall terhadap pemahaman konsep IPA kelas IV. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 10*(2). https://doi.org/10.23969/jp.v10i02.28722

Nisa, N. L., & Kusumadewi, R. F. (2024). Pengaruh model Problem Based Learning berbantuan Wordwall terhadap kemampuan berpikir tingkat tinggi pada pembelajaran matematika. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 10*(2). https://doi.org/10.23969/jp.v10i02.25623

Permata Sari, I., Nanto, D., & Putri, A. A. (2022). Pengaruh hasil belajar pendidikan fisika siswa menggunakan teknik meta-analisis dengan model PBL (Problem Based Learning).

Jurnal Mentari: Manajemen, Pendidikan dan Teknologi Informasi, 1(1), 20–28. https://doi.org/10.33050/mentari.v1i1.124

Regaganis, M., Subekti, E. S., & Sumiyanti. (2024). Peningkatan keaktifan belajar peserta didik melalui media pembelajaran Wordwall pada mata pelajaran Bahasa Indonesia kelas IV SDN Peterongan. *COLLASE (Creative of Learning Students Elementary Education), 7*(2), 274–281. https://doi.org/10.54371/collase.v7i2.22448

Rusman. (2018). *Model-model pembelajaran mengembangkan profesionalisme guru*. Rajawali Pers.

Sa'idah, N. U., Handoyo, E., Supriyadi, S., Dirwanto, D., & Akanto, B. (2024). Pengembangan e-modul berbasis Problem Based Learning terintegrasi Wordwall untuk meningkatkan kemampuan kognitif siswa. *ELSE (Elementary School Education Journal), 8*(2). https://doi.org/10.30651/else.v8i2.20967

Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. *Computers & Education, 149*, 103819. https://doi.org/10.1016/j.compedu.2020.103819

Salsabila, S., Caska, C., & Hendripides, H. (2025). Implementasi model pembelajaran Problem-Based Learning berbasis Wordwall untuk meningkatkan hasil belajar peserta didik. *JIIP: Jurnal Ilmiah Ilmu Pendidikan, 8*(7), 8447–8456. https://doi.org/10.54371/jiip.v8i7.8854

Sari, A. R., Rahmawati, D., & Nugroho, A. (2022). The effect of gamification on student motivation and learning outcomes: A systematic review. *Journal of Educational Technology Systems, 51*(2), 223–245. https://doi.org/10.1177/00472395221080215

Sugiyono. (2021). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif, dan R&D*. Alfabeta

Wordwall. (n.d.). *Wordwall official website*. https://wordwall.net