



Significant Improvement of Students' Conceptual Understanding in Indonesian Language Learning through the Flipped Classroom Model

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Abstract: This study examines the effectiveness of the flipped classroom model in improving students' conceptual understanding in Indonesian language learning. A quantitative quasi-experimental study with a non-equivalent control group design was conducted among 50 eleventh-grade students at a private senior high school in Tangerang, Indonesia. Twenty-five students participated in the flipped classroom group, while 25 received conventional instruction. Data were collected through pre-test and post-test assessments developed to measure the application, analysis, and interpretation of Indonesian language concepts. The findings showed that the experimental group's mean score increased from 63.84 to 84.00, whereas the control group increased from 63.68 to 69.48. An independent-samples t-test indicated a significant post-test difference between groups ($t = 10.012$, $df = 48$, $p < 0.001$), with a mean difference of 14.52. The findings indicate that the flipped classroom model provides a promising student-centered strategy for strengthening conceptual understanding in Indonesian language learning.

Abstrak: Penelitian ini mengkaji efektivitas model flipped classroom dalam meningkatkan pemahaman konseptual siswa pada pembelajaran Bahasa Indonesia. Penelitian kuantitatif dengan desain kuasi-eksperimental kelompok kontrol nonekuivalen melibatkan 50 siswa kelas XI di sebuah SMA swasta di Tangerang, Indonesia. Sebanyak 25 siswa mengikuti pembelajaran flipped classroom, sedangkan 25 siswa menerima pembelajaran konvensional. Data dikumpulkan melalui tes awal dan tes akhir yang dirancang untuk mengukur penerapan, analisis, dan interpretasi konsep Bahasa Indonesia. Hasil penelitian menunjukkan bahwa rata-rata skor kelompok eksperimen meningkat dari 63,84 menjadi 84,00, sedangkan kelompok kontrol meningkat dari 63,68 menjadi 69,48. Uji independent-samples t-test menunjukkan perbedaan skor tes akhir yang signifikan antara kedua kelompok ($t = 10,012$, $df = 48$, $p < 0,001$), dengan selisih rata-rata sebesar 14,52. Temuan ini menunjukkan bahwa flipped classroom merupakan strategi pembelajaran berpusat pada siswa yang menjanjikan untuk memperkuat pemahaman konseptual dalam pembelajaran Bahasa Indonesia. Temuan ini relevan bagi pengembangan pembelajaran bahasa aktif.

A. Introduction

The growing emphasis on student-centered learning has encouraged educators to reconsider instructional practices that position students primarily as passive recipients of information. One model that has gained attention is the flipped classroom, which reorganizes conventional instruction by moving initial content exposure outside the classroom and using face-to-face sessions for interactive learning activities (Astra & Khumaeroh, 2019). Students typically study videos or digital materials before class, while classroom time is redirected toward discussion, collaboration, problem-solving, and application. This arrangement is particularly relevant to language education because Indonesian language learning requires more than memorizing linguistic rules. Students need to understand linguistic and cultural concepts, interpret information, communicate ideas, and apply language knowledge in different situations (Gustian et al., 2023). However, lecture-centered instruction may encourage students to memorize facts without adequately understanding their meanings, relationships, or applications, creating a need for approaches that promote critical thinking, active participation, and meaningful conceptual development (Hediani, 2024).

This challenge is especially important because conceptual understanding in Indonesian language learning involves interconnected cognitive and communicative abilities. Students are expected to understand syntax and grammar while also analyzing texts, constructing arguments, interpreting meanings, and applying linguistic concepts across contexts (Febriati et al., 2022). Conventional instruction may not consistently provide sufficient opportunities for these higher-level processes, making it difficult for students to transform information into integrated knowledge. Students therefore require learning environments that facilitate active knowledge construction rather than simple transmission of content (Sukerti et al., 2020). The flipped classroom offers a potentially suitable alternative because it separates initial knowledge acquisition from deeper classroom processing. Students can access materials at their own pace and revisit difficult content, while classroom sessions can focus on applying and clarifying what they have learned (Safiyeh & Farrah, 2020). Such active engagement may support students in connecting, analyzing, and synthesizing information (Prasetya, 2025).

Previous research has reported positive outcomes of flipped classroom approaches across foreign languages, science, mathematics, and other fields (Rapi et al., 2022). In language education, the model can create greater opportunities for communication and active practice because students enter class with preliminary exposure to learning materials. Classroom time can then be devoted to discussion, text analysis, writing tasks, and peer evaluation, which can strengthen practical language abilities and conceptual understanding (Makruf et al., 2021). Digital technology further supports this structure through videos, online tests, and digital texts that enable students to revisit content according to their needs (Ramadoni, 2023). Digital resources can also provide contextualized language input through examples and explanations (Basriyah et al., 2020). Nevertheless, successful implementation

depends partly on students' access to learning resources and digital competence, suggesting that technology should support pedagogy rather than replace it.

The theoretical foundation of this study is constructivist learning theory, which views knowledge as actively constructed through interaction, experience, reflection, and engagement with new information (Ristanto et al., 2022). From this perspective, students develop stronger understanding when they connect new concepts with prior knowledge, discuss ideas, receive feedback, and apply knowledge to meaningful situations. The flipped classroom reflects these assumptions by encouraging learner independence, peer cooperation, and active participation while positioning teachers as facilitators of learning (Rusnayati et al., 2023). This perspective is particularly relevant to conceptual understanding, which extends beyond factual recall to explaining relationships, recognizing linguistic patterns, interpreting semantic connections, and applying language appropriately across contexts (Khasanah & Anggoro, 2022). Such understanding supports effective communication and higher-order thinking, whereas surface-oriented learning may leave students with fragmented knowledge (Novitri et al., 2022).

Despite increasing interest in flipped learning, an important gap remains in Indonesian language instruction. Existing studies have largely focused on other disciplines or foreign language learning, while empirical research on mother-tongue education remains comparatively limited. Indonesian studies have also tended to emphasize general achievement, motivation, participation, or specific language skills rather than conceptual understanding as a distinct cognitive outcome (Pratiwi et al., 2022; Putri et al., 2019). Although Hediani (2024) examined flipped classroom implementation in Indonesian language learning, further empirical evidence is needed to determine whether the model produces measurable differences in students' conceptual understanding. This gap is important because meaningful mastery of Indonesian language concepts requires students to move beyond factual recognition toward interpretation, synthesis, critical examination, and application.

The present study addresses this gap by examining the flipped classroom specifically in Indonesian language learning and by focusing on conceptual understanding as the principal cognitive outcome. The instructional design combines pre-class digital materials with structured classroom activities involving discussion, collaboration, critical reflection, and language application. This approach is consistent with contemporary digital pedagogy, in which technology is used to facilitate meaningful participation rather than simply deliver content (Purnomo et al., 2025). Accordingly, the study asks: (1) Is there a significant difference in conceptual understanding between students taught using the flipped classroom model and those taught using traditional methods? and (2) How does the flipped classroom model influence the depth of students' comprehension and application of Indonesian language concepts?. The study therefore aims to determine the effectiveness of the flipped classroom model in strengthening conceptual understanding and to provide context-specific evidence for student-centered, technology-supported Indonesian language education.

B. Method

This study employed a quantitative quasi-experimental approach with a non-equivalent control group design to examine the effectiveness of the flipped classroom model in developing students' conceptual understanding of Indonesian language learning. The research was conducted at a private senior high school in Tangerang, Indonesia, during a four-week period in the even semester of the 2023–2024 academic year. The school was selected based on its comparable student academic profile and readiness to adopt technology-based learning. All stages of the research, including pre-class preparation, classroom activities, and assessment, were completed within the designated research period.

The participants were 50 eleventh-grade students enrolled in Indonesian language learning. They were divided into an experimental group consisting of 25 students and a control group consisting of 25 students. The experimental group was taught using the flipped classroom model, in which students accessed instructional videos and digital materials before classroom meetings and subsequently participated in collaborative analysis and interactive learning activities. The control group received conventional lecture-based instruction. The primary object of the study was students' conceptual understanding of Indonesian language, which was assessed through their performance on pre-test and post-test measures as well as their involvement in the learning process.

The research procedure consisted of four sequential stages: preparation, pre-test, treatment, and post-test. During the preparation stage, instructional videos and digital learning materials were developed and the assessment instruments were prepared. The pre-test was administered to both groups to measure their initial conceptual understanding before the intervention. During the treatment stage, students in the experimental group studied the assigned materials before class and engaged in collaborative analysis during classroom sessions, whereas students in the control group received traditional lecture-based instruction. After the treatment, both groups completed the post-test to assess their final conceptual understanding.

As shown in Figure 1, the research followed four main stages: preparation, pre-test, treatment, and post-test. During the preparation stage, instructional videos and digital learning materials were developed, and the research instruments were validated. Following the pre-test, students were divided into an experimental group that received the flipped classroom intervention and a control group that received traditional lecture-based instruction. Both groups subsequently completed the post-test, after which the collected data were analyzed and the findings were reported to formulate the study's conclusions. Data were collected using standardized tests based on Bloom's Taxonomy, with emphasis on the application and synthesis of Indonesian language concepts. The instruments underwent expert judgment by specialists in language pedagogy to ensure content accuracy, while internal consistency was assessed using Cronbach's Alpha. Data analysis was conducted using SPSS and involved descriptive statistics, normality testing, paired-samples

t-tests, and independent-samples t-tests. Descriptive statistics were used to summarize pre-test and post-test performance, the Kolmogorov-Smirnov test was used to examine data normality, paired-samples t-tests were employed to examine changes within each group, and an independent-samples t-test was used to compare post-test performance between the experimental and control groups. A significance level of 0.05 was applied to determine statistical differences.

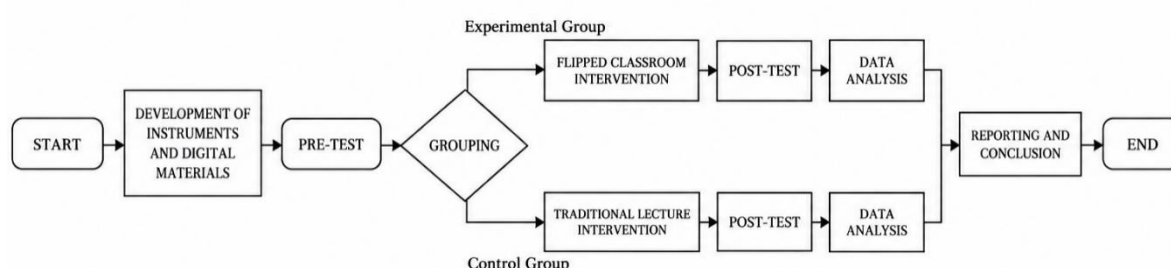


Figure 1. Research Flow

C. Result

The study's findings provide a thorough summary of the ways in which the flipped classroom paradigm affected students' conceptual grasp of the Indonesian language. The experimental and control groups' pre-test and post-test results were compared using statistical techniques. Both the individual group improvements and the relative efficacy of the two teaching strategies were evaluated using descriptive statistics, normality testing, and t-tests. The experimental group had a more significant increase in conceptual comprehension, according to the results, which clearly suggest a difference in the learning outcomes. The interpretation of the educational consequences of flipped learning in language instruction is based on these findings. The quantitative analysis presented in this section is supported by comprehensive tables and significance levels.

Table 1. Descriptive Statistics

Group	N	Mean (Pre-test)	Mean (Post-test)	Std. Deviation
Experimental	25	63.84	84.00	2.74
Control	25	63.68	69.48	2.40

The experimental and control groups' descriptive data, which show the mean scores before and after the intervention, are shown in Table 1. The pre-test mean score for the experimental group was 63.84, while the post-test mean score rose to 84. The control group, on the other hand, began with a comparable mean pre-test score of 63.68 but improved less, reaching 69.48. The data points were closely distributed around the mean, as indicated by the comparatively low standard deviation values for both groups. These results imply that conceptual knowledge increased more noticeably for students in the flipped classroom group.

The two groups' significantly different post-test results highlight how successful the flipped classroom approach is. Despite starting from an identical starting point, the experimental group showed greater academic gains, indicating that the instructional model significantly improved learning outcomes. The premise that a stronger engagement with the topic is fostered by the flipped classroom approach is also supported by the descriptive statistics. This is demonstrated by the experimental group's lower post-test score spread and higher average improvement. These first findings serve as the basis for additional statistical analysis.

Table 2. Normality Test (Kolmogorov–Smirnov Test)

Group	Sig. (Pre-test)	Sig. (Post-test)	Conclusion
Experimental	0.200	0.176	Normally distributed
Control	0.147	0.201	Normally distributed

The Kolmogorov–Smirnov normality test findings for the pre-test and post-test scores of the experimental and control groups are shown in Table 2. Since every significance value (Sig.) is higher than 0.05, the data for both groups are considered to be normally distributed. In particular, the experimental group's pre-test and post-test significance levels were 0.200 and 0.176, respectively, whereas the control group's were 0.147 and 0.201, respectively. This shows that the parametric testing assumptions are satisfied. The use of t-tests in further studies is justified by the data's normality.

The validity of the statistical methods employed in this investigation depends on the validation of the normal distribution. The validity of comparing mean differences using t-tests is strengthened because both groups passed the normalcy test. Additionally, it suggests that the observed gains are not the result of data abnormalities or outliers. As a result, it is possible to understand the results of additional inferential tests with more assurance. Therefore, normality testing is a crucial step in bolstering the validity of the study findings.

Table 3. Paired Sample t-Test

Group	t-value	df	Sig. (2-tailed)	Conclusion
Experimental	10.382	24	0.000	Significant improvement
Control	4.216	24	0.000	Moderate improvement

The results of the paired sample t-test for each group are shown in Table 3. With a significance level of 0.000 and a t-value of 10.382, the experimental group demonstrated a highly significant improvement in post-test scores. A moderate but substantial improvement was also suggested by the control group's t-value of 4.216, which similarly had a significance level of 0.000. These findings show that both instructional strategies

produced quantifiable learning improvements. The experimental group's higher t-value, however, points to a more significant effect.

The flipped classroom model is more effective, as seen by the difference in t-values and significance levels between the two groups. Although there was some improvement with traditional education, it was not as great as with the flipped approach. The significance of instructional design in improving conceptual understanding is highlighted by this disparity. The conclusion that the flipped classroom performed noticeably better than the traditional approach is further supported by the independent t-test result. When taken as a whole, these results offer compelling empirical support for the model's influence on student learning.

Table 4. Independent Sample t-Test (post-test comparison between groups)

t-value	df	Sig. (2-tailed)	Mean Difference	Conclusion
10.012	48	0.000	14.52	Significant difference between both groups

The results of the independent sample t-test used to compare the experimental and control groups' post-test scores are shown in Table 4. A statistically significant difference between the two groups is indicated by the computed t-value of 10.012 at a significance level of 0.000. The experimental group scored significantly higher, as seen by the mean difference of 14.52. This demonstrates that improved post-intervention performance was a result of the flipped classroom strategy. This result is unlikely to have happened by accident, as indicated by the low p-value.

The findings from Table 4 strengthen the argument that the flipped classroom model is more effective in enhancing students' conceptual understanding than traditional instruction. The significant gap in performance indicates that the method of delivery had a meaningful impact on learning outcomes. These results align with previous studies that advocate for active learning and student-centered pedagogies. The effectiveness of the flipped model is especially noteworthy given that both groups started at similar pre-test levels. Therefore, the instructional strategy emerges as the critical factor driving post-test achievement.

Table 5. Independent Sample t-Test and Effect Size

t-value	df	Sig. (2-tailed)	Mean Difference	Effect Size (Cohen's d)
10.012	48	0.000	14.52	5.63 (Very Large)

The calculated t-value of 10.012 with a significance level of 0.000 indicates a statistically significant difference between the experimental and control groups. Furthermore, the Cohen's d value of 5.63 represents a very large effect size, indicating that the flipped classroom model had a substantial practical impact on improving conceptual understanding compared to traditional instruction.

D. Discussion

The findings demonstrate that students who participated in the flipped classroom model achieved higher conceptual understanding of Indonesian language than those who received conventional instruction. The experimental group increased from a pre-test mean of 63.84 to a post-test mean of 84.00, whereas the control group increased from 63.68 to 69.48. The between-group comparison also showed a statistically significant post-test difference, with a mean difference of 14.52, $t = 10.012$, $df = 48$, and $p < 0.001$. These results indicate that the flipped classroom created more favorable conditions for conceptual learning than conventional instruction within the context of this study. The finding is consistent with the rationale of student-centered learning, in which students are expected to participate actively in constructing knowledge rather than primarily receiving information from teachers. The observed difference is also compatible with previous evidence that flipped learning can improve academic performance by increasing students' preparation and engagement before and during classroom learning (Rapi et al., 2022; Prasetya, 2025).

The higher performance of the experimental group may be explained by the instructional sequence embedded in the flipped classroom model. Students were exposed to instructional videos and digital materials before classroom meetings, allowing them to encounter essential concepts in advance and revisit difficult information according to their own learning pace. Classroom time could then be used for collaborative analysis, discussion, problem-solving, and application rather than being dominated by initial content delivery. This arrangement potentially increases the amount of time students spend actively processing linguistic concepts. Safiyeh & Farrah (2020) found that flipped learning allows students to study materials at their own pace and arrive in class better prepared, while Makruf et al (2021) emphasized the value of collaborative and communicative activities in developing language competence. Ramadoni (2023) similarly showed that digital materials allow learners to review content according to their individual needs. Therefore, the advantage observed in the experimental group may be related not simply to the use of technology, but to how pre-class preparation and active classroom learning were combined.

The findings can be explained primarily through Constructivist Learning Theory, which views learning as an active process in which students construct knowledge through interaction, experience, reflection, and engagement with new information (Ristanto et al., 2022). The flipped classroom is consistent with this perspective because students first develop an initial understanding independently and then refine that understanding through interaction with teachers and peers during classroom activities. Rather than positioning the teacher as the sole source of knowledge, the model allows the teacher to function as a facilitator of learning (Rusnayati et al., 2023). This theoretical explanation is particularly relevant to conceptual understanding because understanding a language concept requires students to establish relationships among linguistic forms, meanings, and contexts rather than memorize isolated rules. Khasanah & Anggoro (2022) describe conceptual understanding as the ability to recognize linguistic patterns, understand semantic

relationships, and apply language knowledge for particular purposes. Thus, the higher post-test performance may reflect the greater opportunity provided by the flipped model for students to construct and apply conceptual knowledge.

The results are also compatible with Bloom's Taxonomy because the assessment instrument emphasized the application and synthesis of Indonesian language concepts rather than simple factual recall. The flipped classroom structure provides more classroom time for cognitive processes involving application, analysis, interpretation, and synthesis. Students who encounter basic information before class can use face-to-face time to work with more complex tasks requiring them to explain relationships, analyze language use, and apply concepts to contextual problems. This interpretation is supported by [Rapi et al \(2022\)](#), who reported that flipped classroom-based learning can strengthen critical thinking by allowing students to apply theoretical knowledge in collaborative settings. [Ristanto et al \(2022\)](#) also found that digital materials integrated into flipped learning can facilitate deeper understanding of complex subject matter. In Indonesian language education, these processes are particularly important because conceptual mastery extends beyond grammar knowledge to text analysis, argument construction, interpretation, and contextual language use ([Febriati et al., 2022](#)).

The present findings are also consistent with previous research demonstrating the broader potential of flipped classroom pedagogy. [Heni & Ridlo \(2021\)](#) reported that flipped learning could improve conceptual mastery and self-efficacy, while [Rapi et al \(2022\)](#) found benefits for conceptual understanding and critical thinking. [Prasetya \(2025\)](#) highlighted the contribution of active engagement to academic performance, and [Sukerti et al \(2020\)](#) demonstrated the relevance of flipped learning for language instruction. At the same time, the current study provides a more specific contribution because its outcome is not limited to general academic achievement or motivation. Previous Indonesian research has often focused on participation, motivation, or particular language skills ([Pratiwi et al., 2022](#); [Putri et al., 2019](#)), whereas the present study operationalizes conceptual understanding through assessments emphasizing application, analysis, and interpretation. In this respect, the study extends existing literature by providing context-specific evidence from Indonesian language learning at the senior high school level.

The significant improvement observed in the control group is also noteworthy. Its mean score increased from 63.68 to 69.48, indicating that conventional instruction was still capable of supporting some development in conceptual understanding. However, the larger gain in the experimental group suggests that the organization of learning activities may have provided additional opportunities for students to engage with concepts more deeply. This distinction is important because the findings do not imply that conventional teaching is ineffective, but rather that the flipped classroom may offer a more favorable structure for combining individual preparation with active classroom processing. The result also supports the argument that the effectiveness of flipped learning depends on the quality of the pre-class materials and the nature of the subsequent classroom activities rather than on the technological component alone. Previous research emphasizes that meaningful pre-class

materials and well-designed interactive classroom tasks are essential to successful implementation (Huda et al., 2019; Makruf et al., 2021).

Taken together, the findings answer the first research question by showing a statistically significant difference in conceptual understanding between students taught through the flipped classroom model and those taught through conventional instruction, with the experimental group achieving the higher post-test performance. They also address the second research question by indicating that the flipped classroom supports deeper comprehension and application of Indonesian language concepts through the combination of independent pre-class preparation, collaborative classroom interaction, analysis, reflection, and application. The contribution of this study therefore lies in demonstrating that flipped classroom pedagogy can move Indonesian language learning beyond predominantly lecture-based knowledge transmission toward a more active process of conceptual construction. Nevertheless, the findings should be interpreted within the specific context of one school and a four-week intervention. The evidence supports the effectiveness of the model in the present setting, while broader and longer-term studies are needed to determine whether similar patterns are maintained across different schools, learner populations, language competencies, and educational contexts.

E. Implication

The findings of this study have important implications for Indonesian language teaching, particularly for developing student-centered learning that emphasizes conceptual understanding rather than memorization. The higher post-test performance of students in the flipped classroom group suggests that teachers can provide instructional videos and digital materials before class to introduce essential concepts, while classroom time can be used for discussion, collaborative analysis, problem-solving, interpretation, and application of Indonesian language concepts. This approach can encourage students to become more active in constructing and applying knowledge while allowing teachers to function more effectively as facilitators of learning. The findings also indicate the importance of designing learning activities that target higher-order cognitive processes, particularly application, analysis, interpretation, and synthesis. At the institutional level, successful implementation requires adequate digital learning resources, teacher competence in preparing meaningful pre-class materials and classroom activities, and equitable student access to technology. At the curriculum level, the flipped classroom can support the integration of digital learning with functional and communicative Indonesian language instruction by providing greater opportunities for students to apply linguistic concepts in contextual situations. Overall, the implication is that the value of the flipped classroom does not simply lie in moving instructional content outside the classroom, but in transforming classroom time into a more active environment for conceptual development, interaction, reflection, and application.

F. Limitation and Suggestion for Further Research

This study has several limitations that should be considered when interpreting the findings. First, the research was conducted in only one private senior high school in Tangerang with a relatively small sample of 50 eleventh-grade students, which limits the generalizability of the findings to broader and more diverse educational contexts. Second, the intervention was implemented over a four-week period, making it difficult to determine whether the observed differences in conceptual understanding would be maintained over a longer period. Third, the study relied primarily on quantitative test data, which provided measurable evidence of learning outcomes but offered limited insight into students' experiences, perceptions, and difficulties during the flipped classroom implementation. In addition, differences in students' access to technological resources and levels of digital competence may have affected their participation in pre-class learning activities.

Further research should address these limitations by involving larger samples drawn from multiple schools and different geographical and educational contexts to strengthen the external validity of the findings. Longitudinal studies are also needed to examine whether the benefits of flipped classroom learning on conceptual understanding are sustained over time and transferred to other language learning situations. Future researchers could employ mixed-methods designs that combine quantitative assessments with interviews, classroom observations, or student reflections to provide a more comprehensive understanding of how the model influences learning processes. Further studies may also examine the role of students' digital competence and access to technology as factors that shape the effectiveness of flipped learning, while extending investigation to other Indonesian language domains, including learner autonomy, critical communicative competence, and specific language skills.

G. Conclusion

This study concludes that the flipped classroom model provides a promising approach for strengthening students' conceptual understanding in Indonesian language learning at the senior high school level. The experimental group demonstrated a greater increase in mean scores than the control group, rising from 63.84 to 84.00 compared with an increase from 63.68 to 69.48, while the post-test comparison showed a statistically significant difference between the groups ($t = 10.012$, $df = 48$, $p < 0.001$) with a mean difference of 14.52. These findings indicate that the flipped classroom can create greater opportunities for students to engage with Indonesian language concepts through pre-class preparation and more active classroom activities involving discussion, analysis, collaboration, and application. The study therefore answers the research questions by demonstrating a significant difference in conceptual understanding between the two instructional groups and by indicating that the flipped classroom supports deeper comprehension and application of Indonesian language concepts. Nevertheless, the findings should be interpreted within the context of the study setting, sample, and intervention period.

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