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The Effect of the Jigsaw Cooperative Learning Model on Reading Comprehension Ability of Grade V Students at Primary School

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ABSTRACT

This study aims to analyse the effect of the Jigsaw cooperative learning model on the reading comprehension ability of Grade V students at SD Negeri 29, Sorong City. The study was motivated by the persistently low reading comprehension ability observed among Grade V students, characterised by limited understanding of reading texts, low reading interest, and the predominance of conventional, teacher-centred instructional methods that do not actively engage students. A quantitative approach with a quasi-experimental Nonequivalent Control Group Design was employed, involving one experimental class implementing the Jigsaw model and one control class receiving conventional instruction. The sample comprised Grade V students from two parallel classes, selected using purposive sampling. Data were collected through a 20-item multiple-choice reading comprehension test (pretest and posttest), observation, and documentation. Instrument validity was confirmed through expert judgment and item analysis; reliability was assessed using Cronbach's Alpha. Descriptive statistical analysis, N-Gain analysis, normality testing (Shapiro-Wilk), homogeneity testing (Levene's Test),

and hypothesis testing (paired t-test) were conducted. Descriptive results show that the experimental group's mean increased from 2.98 (pretest) to 4.00 (posttest), a gain of 1.02 points, while the control group improved by only 0.40 points (from 2.70 to 3.10). The Shapiro-Wilk normality test confirmed normal data distributions (pretest Sig. = 0.551; posttest Sig. = 0.676; both > 0.05). The Levene homogeneity test confirmed equal variances (F = 0.421, Sig. = 0.520 > 0.05). The paired t-test yielded Sig. (p-value) = 0.000 (< 0.05), leading to the rejection of H_0 and acceptance of H_1. N-Gain analysis produced a value of 0.505 for the experimental group (Moderate category) and 0.200 for the control group (Low category). It is concluded that the Jigsaw cooperative learning model has a statistically significant positive effect on the reading comprehension ability of Grade V students at SD Negeri 29, Sorong City, and constitutes an effective, student-centred, and interactive alternative for reading instruction at the primary school level.

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INTRODUCTION

Reading comprehension is a foundational cognitive skill in primary education that extends beyond mere word recognition to encompass the active construction of meaning from text, including comprehension, interpretation, inferencing, and critical evaluation of reading content. At the Grade V level, students are transitioning from reading to learn, making the depth and quality of reading comprehension increasingly important for academic success across all subject areas (Nurhadi, 2015; Somadaya, 2011). Despite its centrality, reading comprehension instruction at the primary school level in Indonesia continues to be dominated by conventional, teacher-centred methods that limit student engagement, reduce active meaning-making, and fail to develop higher-order

reading skills such as main idea identification, inferencing, and critical evaluation of text (Shoimin, 2016). Preliminary observations at SD Negeri 29, Sorong City, confirmed this pattern: Grade V students demonstrated limited reading comprehension, characterised by difficulty understanding text content, low interest in reading, and passive participation in reading lessons.

Among the cooperative learning models with demonstrated effectiveness for reading comprehension improvement, the Jigsaw model is one of the most widely researched and applied. Developed by Aronson et al. (1978) and subsequently refined by Slavin (2015), the Jigsaw model divides students into home groups and expert groups, with each student responsible for mastering one segment of the text and teaching it to their home group peers. This structure cultivates individual accountability, reciprocal teaching, collaborative meaning construction, and active text engagement, all of which are theoretically and empirically linked to reading comprehension development (Johnson & Johnson, 2009; Slavin, 2015). Shoimin (2016) emphasises that Jigsaw encourages each student to take responsibility for their assigned reading content, while Isjoni (2014) adds that Jigsaw strengthens social skills and deepens understanding through peer teaching activities.

Internationally, robust Scopus-indexed evidence supports the effectiveness of the Jigsaw model for academic achievement and reading outcomes. Stanczak et al. (2022), in a landmark study published in the Journal of Educational Psychology (APA/Scopus), conducted five experiments and an internal meta-analysis confirming that Jigsaw classrooms overall produce positive effects on learning outcomes, with particularly consistent effects when students are engaged as peer teachers within the expert group structure. Kebede et al. (2025), in a SAGE Open (Scopus-indexed) quasi-experimental study, demonstrated that the Jigsaw cooperative learning model significantly improved biology achievement among secondary school students compared to traditional lecture methods ($p < 0.001$), with strong positive effects on peer interaction and academic responsibility. In the Indonesian context, Astuti et al.

(2024) demonstrated that the Jigsaw model improved English reading comprehension among elementary school students, and Ningsih et al. (2024) confirmed the positive effect of the Jigsaw cooperative type on reading ability at the primary school level. Al-Tamimi et al. (2024) further confirmed in a Cogent Education study that Jigsaw strategy significantly improved reading comprehension among fifth-grade EFL learners in a quasi, experimental study.

The present study addresses a specific empirical gap: while the Jigsaw model has been investigated in various Indonesian school contexts, its application specifically to reading comprehension ability of Grade V students at SD Negeri 29, Sorong City, has not previously been examined. This study aims to: (1) analyse the effect of the Jigsaw cooperative learning model on the reading comprehension ability of Grade V students at SD Negeri 29, Sorong City; and (2) determine the magnitude of that effect using N-Gain analysis.

METHODS

Research Design

This research employed a quantitative approach with a quasi-experimental Nonequivalent Control Group Design. This design involves two groups (an experimental class implementing the Jigsaw model and a control class receiving conventional instruction) with pretest and posttest administered to both groups. Random assignment of classes was not possible given the intact classroom structure of SD Negeri 29; the Nonequivalent Control Group Design is appropriate in this context as it enables comparison of instructional effectiveness while acknowledging the absence of random assignment (Sugiyono, 2015). The research was conducted at SD Negeri 29, Sorong City, over four weeks, encompassing instrument preparation, instructional delivery, treatment, and data collection phases.

Sample

The research population comprised all Grade V students at SD Negeri 29, Sorong City, during the 2024/2025 academic year, organised in two parallel

classes. Purposive sampling was applied, with one class designated as the experimental group (Jigsaw model) and one as the control group (conventional instruction), based on the comparability of baseline reading ability between the two classes.

Research Instrument

The research instrument was a 20-item multiple-choice reading comprehension test developed based on reading comprehension indicators aligned with the primary school Indonesian Language curriculum, specifically: identifying the main idea, retrieving detailed information, determining word meaning in context, and making inferences. Instrument development followed a systematic process: item specification table preparation, item writing, expert content validity review, and pilot testing to analyse item difficulty, discriminating power, and reliability using Cronbach's Alpha.

Data Analysis

Data were analysed through five sequential procedures: (1) descriptive statistical analysis (mean, median, mode, minimum, maximum, standard deviation) to characterise the pretest and posttest distributions of both groups; (2) N-Gain analysis to determine the magnitude of reading comprehension improvement, using the formula N-Gain = (Posttest − Pretest) / (Ideal Score − Pretest), with Hake's (1999) criteria: High (N-Gain > 0.70), Moderate (0.30 < N-Gain ≤ 0.70), Low (N-Gain < 0.30); (3) normality testing using Shapiro-Wilk (appropriate for samples < 50); (4) homogeneity testing using Levene's Test; and (5) hypothesis testing using the paired t-test (Independent Samples t-Test) at $\alpha = 0.05$.

RESULTS AND DISCUSSION

Descriptive Statistics

The descriptive statistical analysis of pretest and posttest reading comprehension scores for both the experimental and control groups is presented in Table 1.

Table 1. Descriptive Statistics: Pretest and Posttest Reading Comprehension Scores

Group	Mean Pretest	Mean Posttest	Gain
Experimental (Jigsaw)	2.98	4.00	1.02
Control (Conventional)	2.70	3.10	0.40

Source: Primary data, SD Negeri 29 Sorong City, 2025.

Table 1 shows that the experimental group's mean reading comprehension score improved from 2.98 (pretest) to 4.00 (posttest), representing a gain of 1.02 points. The control group improved by only 0.40 points (from 2.70 to 3.10). The differential improvement of 0.62 points in favour of the experimental group provides initial descriptive evidence of the Jigsaw model's superiority over conventional instruction for reading comprehension development at the Grade V level.

Normality Test

The Shapiro-Wilk normality test was applied to both the pretest and posttest data. Results are presented in Table 2.

Table 2. Shapiro-Wilk Normality Test Results

Variable	Shapiro-Wilk Statistic	df	Sig. (p-value)	Conclusion
Pretest	0.960	–	0.551	Normal
Posttest	0.966	–	0.676	Normal

Source: Primary data processed with SPSS.

The Shapiro-Wilk significance values for both the pretest (0.551 > 0.05) and posttest (0.676 > 0.05) confirm that both distributions are normal. The normality

assumption required for parametric hypothesis testing (paired t-test) is satisfied.

Homogeneity Test

The Levene's Test for equality of variances was conducted to confirm homogeneity between the two groups. Results are presented in Table 3.

Table 3. Levene's Test of Homogeneity of Variances

Test	F	df₁	df₂	Sig. (p-value)	Conclusion
Levene's Test	0.421	1	38	0.520	Homogeneous

Source: Primary data processed with SPSS.

The Levene's Test produced F = 0.421 and Sig. = 0.520 (> 0.05), confirming that the two groups have equal variances and that the data satisfy the homogeneity assumption for parametric testing.

Hypothesis Testing: Paired t-Test

With normality and homogeneity assumptions both satisfied, the paired t-test was applied to test the hypothesis that the Jigsaw model produces significantly different reading comprehension outcomes compared to baseline (pretest) performance. Results are presented in Table 4.

Table 4. Paired t-Test Results: Experimental Group (Pretest–Posttest)

Pair	t	df	Sig. (p-value)	Decision
Pretest–Posttest (Experimental)	−17.859	19	0.000	H_0 rejected; H_1 accepted

Source: Primary data processed with SPSS.

The paired t-test yielded t = −17.85, df = 19, and Sig. (p-value) = 0.000, which is less than α = 0.05. H_0 is rejected and H_1 is accepted: there is a statistically significant difference between the pretest and posttest reading comprehension scores of the experimental group following the implementation of the Jigsaw cooperative learning model. The Jigsaw model exerts a significant

positive effect on the reading comprehension ability of Grade V students at SD Negeri 29, Sorong City.

N-Gain Analysis

The N-Gain analysis was conducted to determine the magnitude of reading comprehension improvement in both groups, using the formula: N-Gain = (Posttest − Pretest) / (Ideal Score − Pretest), with an ideal score of 5.00. Results are presented in Table 5.

Table 5. N-Gain Analysis: Experimental and Control Groups (Hake, 1999 Criteria)

Group	Mean Pretest	Mean Posttest	Ideal Score	N-Gain	Category
Experimental (Jigsaw)	2.98	4.00	5.00	0.505	Moderate
Control (Conventional)	2.70	3.10	5.00	0.200	Low

Criteria (Hake, 1999): High: N-Gain > 0.70; Moderate: 0.30 < N-Gain ≤ 0.70; Low: N-Gain < 0.30.

The experimental group's N-Gain of 0.505 is classified as Moderate according to Hake's (1999) criteria. The control group's N-Gain of 0.200 is classified as Low. The experimental group's N-Gain substantially exceeds that of the control group (0.505 vs. 0.200), confirming that the Jigsaw model produces meaningfully greater reading comprehension improvement than conventional instruction, even though the experimental group's effect size remains at the Moderate level.

Discussion

The findings of this study confirm that the Jigsaw cooperative learning model has a statistically significant and educationally meaningful positive effect on the reading comprehension ability of Grade V students at SD Negeri 29, Sorong City. The combination of a significant paired t-test result (p = 0.000), a mean gain of 1.02 points for the experimental group compared to 0.40 for the control

group, and a Moderate N-Gain (0.505 vs. 0.200) provides a comprehensive and converging evidence base for the effectiveness of the Jigsaw model in this context.

The theoretical basis for these findings is grounded in the cooperative learning framework articulated by Slavin (2015) and Johnson and Johnson (2009). Within the Jigsaw structure, each student is assigned responsibility for one segment of the reading text and must master it sufficiently to teach their home group peers. This dual role, as both learner and teacher, activates higher-order cognitive processing of the text, including main idea identification, synthesis, and elaboration, which are precisely the reading comprehension dimensions targeted in the research instrument. The reciprocal teaching dynamic of the Jigsaw model creates what Johnson and Johnson (2009) characterise as positive interdependence: each student's success in reading comprehension depends on and contributes to the comprehension of the entire group, creating a motivational structure that is fundamentally absent in conventional, individualised reading instruction.

These findings are strongly corroborated by recent Scopus-indexed research. Stanczak et al. (2022), in five experiments and an internal meta-analysis published in the Journal of Educational Psychology, confirmed that Jigsaw classrooms produce overall positive effects on learning outcomes, with effect size variation depending on implementation fidelity and the degree to which the expert group teaching mechanism is activated. The consistent finding that Jigsaw produces Moderate (rather than High) N-Gain in the present study, and the pattern of effect variability documented by Stanczak et al. (2022), suggests that extending the duration of Jigsaw implementation and refining the quality of expert group preparation and peer teaching might further elevate the N-Gain from Moderate to High in future iterations of this intervention at SD Negeri 29. Kebede et al. (2025), in a SAGE Open study, further confirmed that Jigsaw cooperative learning produced significantly higher achievement

compared to conventional instruction in secondary school contexts, with the peer teaching mechanism and individual accountability structure identified as the primary drivers of the positive effect.

In the Indonesian elementary school context, the findings are consistent with Astuti et al. (2024), who documented improvements in reading ability through Jigsaw implementation at the primary level, and with Ningsih et al. (2024), who confirmed the positive effect of the Jigsaw cooperative type on reading skills in elementary school students. Al-Tamimi et al. (2024) similarly confirmed that the Jigsaw strategy produced a statistically significant improvement in reading comprehension among fifth-grade learners in a quasi-experimental study, directly paralleling the grade level and research design of the present investigation

CONCLUSION

This study concludes that the Jigsaw cooperative learning model has a statistically significant positive effect on the reading comprehension ability of Grade V students at SD Negeri 29, Sorong City. The paired t-test yielded a significance value of 0.000 (< 0.05), confirming the rejection of H_0 and acceptance of H_1. The experimental group's mean reading comprehension score improved from 2.98 (pretest) to 4.00 (posttest), a gain of 1.02 points, compared to a gain of only 0.40 points in the control group. N-Gain analysis classified the experimental group's improvement as Moderate (0.505) and the control group's as Low (0.200). Both prerequisite assumptions, normality (Shapiro-Wilk: pretest Sig. = 0.551; posttest Sig. = 0.676) and homogeneity (Levene's F = 0.421, Sig. = 0.520), were confirmed. The Jigsaw model proved effective by activating individual accountability, reciprocal peer teaching, and collaborative meaning construction, transforming reading instruction from passive reception to active, text-engaged cooperation. It is recommended that primary school teachers at SD Negeri 29 and comparable schools in Sorong City adopt the Jigsaw

cooperative learning model systematically for reading comprehension instruction at the Grade V level. Future research should investigate the optimal number of Jigsaw implementation sessions needed to achieve High N-Gain, compare Jigsaw with other cooperative learning models for reading comprehension improvement, and examine the specific text types and reading comprehension dimensions most responsive to Jigsaw instruction in the West Papua primary school context.

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Declarations

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