JURNAL BORNEO HUMANIORA
e-ISSN 2599-3305
p-ISSN 2615-4331
http://jurnal.borneo.ac.id/index.php/borneo_humaniora

Available online at jurnal.borneo.ac.id
Diterbitkan Agustus 2026
Halaman 70 - 80

JIGSAW-BASED READING INSTRUCTION: DOES IT CHANGE STUDENTS' READING COMPREHENSION IN THE BORDER AREA'S SECONDARY SCHOOL?

PEMBELAJARAN MEMBACA BERBASIS JIGSAW: APAKAH BERPENGARUH TERHADAP PEMAHAMAN MEMBACA SISWA DI SEKOLAH MENENGAH KAWASAN PERBATASAN?

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ABSTRACT

This study examined changes in ninth-grade students' reading comprehension following Jigsaw-based instruction at SMPN 1 Tarakan, Indonesia. A quantitative one-group pretest–posttest design was used with 32 students from class IX-3. Students completed reading comprehension assessments before and after four instructional meetings involving home groups, expert groups, descriptive texts, and narrative texts. The study employed descriptive statistics, the Shapiro–Wilk test, and the Wilcoxon signed-rank test. The statistical descriptive table reported an increase in mean scores from 53.59 (SD = 13.984) to 76.87 (SD = 9.483). All 32 paired observations were positive, and the Wilcoxon test indicated a significant pre–post difference ($Z = -4.955$, $p < .001$). It also reported a normalized gain of 0.4973 in the moderate category. The findings suggest that the learning activities were associated with improved reading test performance and increased opportunities for peer explanation.

Keywords: cooperative learning, Jigsaw, reading comprehension, EFL, junior high school.

ABSTRAK

Penelitian ini mengkaji perubahan kemampuan pemahaman membaca siswa kelas IX setelah pembelajaran berbasis Jigsaw di SMPN 1 Tarakan. Penelitian menggunakan pendekatan kuantitatif dengan desain satu kelompok pretest–posttest pada 32 siswa kelas IX-3. Penilaian pemahaman bacaan dilakukan sebelum dan sesudah empat pertemuan pembelajaran yang melibatkan kelompok asal, kelompok ahli, teks deskriptif, dan teks naratif. Analisis data meliputi statistik deskriptif, uji Shapiro–Wilk, dan uji Wilcoxon signed-rank. Tabel statistik deskriptif dalam skripsi melaporkan peningkatan rata-rata dari 53,59 (SD = 13,984) menjadi 76,87 (SD = 9,483). Seluruh 32 pasangan skor menunjukkan peningkatan dan hasil uji Wilcoxon menunjukkan perbedaan bermakna antara pretest dan posttest ($Z = -4{,}955$; $p < 0{,}001$). Skripsi juga melaporkan N-Gain sebesar 0,4973 dengan kategori sedang. Temuan menunjukkan bahwa kegiatan pembelajaran berkaitan dengan peningkatan skor membaca dan memberikan kesempatan bagi siswa untuk saling menjelaskan materi.

***Kata kunci**: bahasa Inggris, Jigsaw, pemahaman membaca, pembelajaran kooperatif, sekolah menengah pertama*.

INTRODUCTION

Reading comprehension is central to English as a foreign language (EFL) learning because students must construct meaning from written texts rather than merely recognize individual words. At the junior-high-school level, this includes locating explicitly stated facts, connecting information across sentences, interpreting vocabulary in context, identifying the main idea, and drawing inferences. These skills are particularly important in descriptive and narrative texts, which require readers to understand both text-specific details and larger relationships between events or ideas. When students cannot connect vocabulary and textual information, they may struggle with

other academic tasks that depend on reading. Effective reading instruction therefore needs to support comprehension processes and create opportunities for learners to articulate what they understand.

Comprehension is a constructive process involving vocabulary, syntactic knowledge, connections across sentences, and inferences based on prior knowledge. Oakhill et al. (2015) explain how these components jointly influence readers' understanding, while Vaughn et al. (2024) emphasize targeted instructional support, particularly for learners having trouble. A review of English-as-a-foreign-language adolescents by Vettori et al. (2024) likewise identifies language and higher-order skills as relevant to comprehension. The distinctions between explicitly stated content and inferred meaning are also discussed by Kamagi (2020) and Nurjanah and Putri (2022). These perspectives justify assessing more than students' ability to identify isolated facts.

The local context of this research was SMPN 1 Tarakan, North Kalimantan, Indonesia. The current study reported a preliminary documentation review in which students' average reading score was 62.4 out of 100, and only approximately 28% reached the stated minimum competency level. Classroom observations described quiet lessons, frequent requests for translation, low participation, and dependence on teachers or classmates. Interviews indicated that students had trouble with vocabulary and comprehension strategies and were more enthusiastic when given opportunities to interact in small groups. These preliminary observations motivated the search for an instructional approach in which learners could discuss assigned materials rather than complete all reading activities independently. Challenges in the participating class are consistent with the wider Indonesian secondary-school context, although the present school's data must be interpreted on their own terms. Nanda and Azmy (2020) reviewed secondary-school EFL reading difficulties and identified vocabulary, prior knowledge, and motivation as recurring concerns. Such contextual evidence supports the relevance of using an interactive teaching strategy but does not, by itself, establish that any one strategy will be effective in this class.

In the Indonesian border-region context, the quality of classroom interaction and teachers' flexibility in implementing educational policies have been recognized as relevant concerns. Ramli, et al. (2025) investigated English teaching under the Merdeka Curriculum in a border-area school and highlighted the practical significance of adapting instruction to classroom conditions. That study did not investigate Jigsaw or reading comprehension, but it provides contextual support for examining learner-centered practices in Tarakan. The present study responds to a more specific classroom problem: whether a structured cooperative model can accompany improvement in ninth graders' reading comprehension within the selected school.

Jigsaw is a cooperative-learning arrangement in which each student becomes responsible for one portion of material, consults peers studying the same portion in an expert group, and returns to a home group to teach the assigned content. The requirement to explain a text segment may encourage students to identify important details, negotiate vocabulary meanings, organize information, and check their understanding. Evidence from reading classrooms suggests that this structure can make student participation visible and provide opportunities for collaborative meaning making (Hind & Astuti, 2024). Nevertheless, positive classroom experiences should not be confused with proof that Jigsaw alone causes higher test scores; a more precise analysis must consider the design, implementation, and statistical evidence available.

Evidence from different school settings motivates further examination of Jigsaw-based reading. Dwiniasih and Nugraha (2019) examined Jigsaw and learners' reading performance; Rosyidi and Hadi (2024) applied a Jigsaw technique in senior-high-school reading; and Putriani et al. (2024) studied Jigsaw combined with pictures in a junior-high-school classroom. In a study of recount texts, Herman et al. (2020) also considered Jigsaw as an alternative to conventional reading instruction. These studies address

different grade levels, texts, and research designs, so their results should be compared cautiously rather than treated as interchangeable estimates of effectiveness.

The research question was whether students' reading comprehension scores differed significantly before and after Jigsaw instruction in class IX-3 at SMPN 1 Tarakan. The objective was to examine the direction and magnitude of the observed change, describe the classroom process, and identify practical implications for reading instruction.

LITERATURE REVIEW

Reading Comprehension and EFL Learning

Reading comprehension involves simultaneous attention to words, propositions, text organization, and the reader's knowledge of the topic. It distinguished literal comprehension, such as identifying stated facts and details, from interpretive comprehension, such as making inferences and understanding implied messages. Those levels guided the present use of descriptive and narrative texts. In a descriptive passage, the reader may need to associate attributes with a person, place, or object; in a narrative, the reader must also follow characters, settings, sequences, causes, and outcomes. The assessment in this study was organized around ten indicators, including information, main idea, vocabulary, paragraph meaning, communicative purpose, and sequence of events. Literal and interpretive comprehension deserve distinct treatment when designing questions. Kamagi (2020) describes literal comprehension in relation to directly stated content and inferential comprehension in relation to information supplied by readers' reasoning. Nurjanah and Putri (2022) argue that adequate literal comprehension can support more advanced comprehension tasks. Therefore, attention to main ideas, specific details, contextual vocabulary, and inferences is appropriate for the stated assessment objective, while conclusions about subskills should depend on verified item-level data.

Language-learning difficulties involve more than a single skill. Ramli, at al. (2022), studying language development in a university EFL setting, identified linguistic and nonlinguistic factors including vocabulary-related demands and learning opportunities that may shape students' English learning. Their participants and design differed from those of the present school study, so their findings are used here to frame the importance of considering language resources and classroom context, not to predict the size of a Jigsaw-related effect. For ninth graders, vocabulary support remains especially relevant when assigned texts contain unfamiliar expressions that can obstruct interpretation. Alternative cooperative approaches also demonstrate that structured peer work can be combined with explicit reading instruction. Maruf and Anjely (2020) investigated Cooperative Integrated Reading and Composition (CIRC) with mobile learning, and Nasim et al. (2024) examined a web-supported CIRC approach for EFL comprehension. These are CIRC studies, not evaluations of Jigsaw, but they help distinguish the broader cooperative-learning rationale from the specific expert-group and home-group sequence.

Cooperative Learning and The Jigsaw Procedure

Cooperative learning places learners in purposeful interaction with shared goals and individual responsibility. In the Jigsaw procedure, home-group members begin with complementary information, join expert groups to understand their own portion, and then return to share explanations. This sequence can reduce exclusive reliance on teacher explanation while increasing students' need to read carefully enough to communicate information to others. However, successful implementation requires materials of manageable difficulty, clearly demonstrated procedures, sufficient discussion time, and monitoring so that all members contribute.

Student roles and teacher preparation are substantive parts of an effective cooperative lesson. Karmina et al. (2024), in an elementary-school study, reported that clearly structured group roles could support meaningful interaction and collaborative decision-making. Supeno and Suseno (2020), discussing Jigsaw for understanding English

texts, likewise emphasized the organization of expert groups and monitoring of participation. These findings are transferable as implementation considerations, not as proof of the magnitude of score gains in SMPN 1 Tarakan.

Beyond language classrooms, Baken et al. (2022) reported Jigsaw-related improvements in undergraduate biology learning, suggesting possible benefits of peer explanation in other subjects; however, their outcomes cannot be directly generalized to EFL reading. The broader literature does not justify an unconditional claim that Jigsaw always improves achievement. Cochon Drouet et al. (2023), in a systematic review and meta-analyses of 69 Jigsaw studies, found heterogeneous outcomes across achievement, motivation, and social measures. Vives et al. (2025) likewise emphasized how implementation and study context affect observed outcomes. The present study therefore treats Jigsaw as a structured opportunity for interactive comprehension practice rather than an inherently superior technique in every classroom. This cautious position is especially important when a study uses only one participating group.

Implementation constraints warrant particular attention. Effendi Hasibuan et al. (2020) documented how class size, limited time, classroom conditions, and procedural complexity interfered with Jigsaw lessons in a different Indonesian subject area. Goolsarran et al. (2020) and Moin et al. (2024) examined Jigsaw applications in medical education, illustrating the technique's adaptability but also its dependence on preparation and task clarity. Their disciplinary distance limits direct comparison with adolescent EFL reading, although the broader lesson about careful instructional design is relevant.

Previous Research and Conceptual Orientation

Hind and Astuti (2024) documented Jigsaw practices in an Indonesian middle-school EFL reading classroom and reported how cooperative discussion and role assignment supported students' engagement with texts. Their case-study emphasis complements the current study by showing classroom processes that may accompany comprehension work. Zahran (2022) also examined Jigsaw in preparatory-stage reading comprehension and vocabulary learning; this related intervention lends context but does not overcome the present design's lack of a control class. The contribution of the Tarakan study is to pair a documented Jigsaw teaching sequence with pretest and posttest reading scores from an entire selected class. The conceptual orientation is straightforward: learners' initial reading ability is measured, Jigsaw instruction provides repeated peer explanation and teacher guidance, and reading ability is measured again. Any difference between the measurements is an observed change, while alternative explanations remain possible in the absence of a comparison group.

Indonesian research provides additional comparisons for the present setting. Pratami and Dewi (2024) described integrating reading and oral explanation through Jigsaw at university level, while Zulyanis and Natasha (2024) investigated the technique in a junior-secondary reading context. A recent EFL-focused systematic review by Panggabean and Bahri (2026) synthesizes studies of Jigsaw and reading comprehension, drawing attention to the structure of peer interaction and individual responsibility. Across these sources, positive findings should be interpreted alongside methodological differences, including group comparability, assessment instruments, and access to adequate teaching time.

METHOD

Design and Participants

The study used a quantitative pre-experimental, one-group pretest–posttest design. A single class of ninth graders (IX-3) at SMPN 1 Tarakan participated during the 2026 academic year. The source described a school population of 128 students across four Grade IX classes and a final study group of 32 students. Although it labels the selection procedure as cluster random sampling, it also reports selection of IX-3 because that class had identified reading difficulties; the precise sampling procedure must therefore be confirmed by the author. The article reports the actual participating class and size without

making a stronger randomization claim than the source can support.

Creswell and Creswell (2018) distinguish pre-experimental arrangements from stronger comparative designs used to investigate treatment effects. The present design was feasible for one intact class, yet it could not separate effects of Jigsaw from other changes during the same instructional period. The term 'pre-experimental' is therefore retained throughout this article, and statistically significant score change is not equated with causal proof. The independent instructional condition was implementation of the Jigsaw Learning Model; the measured outcome was reading comprehension. The study did not contain a non-Jigsaw control group and did not randomly assign individual students to treatment conditions. Thus, the pre–post contrast addresses score changes over time in one class and should not be interpreted as a controlled estimate of causal effectiveness.

Instrument and Instructional Procedure

The reading assessment comprised 20 items combining 15 multiple-choice items and five true–false items. The materials covered descriptive and narrative texts and assessed areas such as main ideas, details, contextual vocabulary, cause–effect relationships, and conclusions. This describes expert validation of item appropriateness in relation to content, construction, and language; however, it does not report a reliability coefficient in the text summarized for this article. Any claim of internal consistency or equal difficulty of the pretest and posttest forms would require additional documentation.

The reported research sequence included six meetings: a pretest, four Jigsaw treatment meetings, and a posttest. Instruction focused first on descriptive texts, including tourist attractions and animals, and then on narrative texts, including fairy tales and legends. Students worked in home groups, joined expert-group discussions on assigned text portions, and returned to explain what they had learned. The teacher provided guiding questions, worksheets, and occasional visual or interactive media. During later meetings, guessing and clue-making activities helped students revisit story information. These activities constituted the instructional treatment, not additional independently measured outcome variables.

The lesson sequence operationalized Jigsaw through changes between home groups and expert groups and by requiring learners to share assigned text content with peers. Comparable classroom accounts highlight the importance of explicit roles and opportunities to explain information to others (Supeno & Suseno, 2020; Pratami & Dewi, 2024). Because teachers also used multimedia and worksheets, the instructional condition should be viewed as a package of teaching practices rather than as a test of the isolated contribution of group structure.

Data Analysis

The analysis used IBM SPSS Statistics 23 for descriptive and inferential analyses. It reported means, standard deviations, minimum and maximum scores, Shapiro–Wilk normality checks, Wilcoxon signed-rank analysis, and a normalized gain index (N-Gain). Because the posttest distribution failed the reported normality check ($p = .033$), the Wilcoxon signed-rank result is used as the main inferential comparison. A paired-samples t-test was also displayed; it is not treated as the primary analysis here. Software output of $p = .000$ is reported in standard manuscript form as $p < .001$, rather than as a literal zero probability.

FINDINGS

Overall Pretest and Posttest Performance

The descriptive-statistics table reported a pretest mean of 53.59 (SD = 13.984, minimum = 20, maximum = 75) and a posttest mean of 76.87 (SD = 9.483, minimum = 55, maximum = 90) (See **Table 1**). The corresponding gain in mean scores is approximately 23.28 points. Shapiro–Wilk tests gave $p = .321$ for the pretest and $p = .033$ for the posttest. The Wilcoxon signed-rank table showed 32 positive ranks, no negative ranks, and no ties. The test statistic was $Z = -4.955$, with the reported two-tailed significance of .000 ($p < .001$). These results establish a statistically significant paired score difference, with higher posttest ranks. Because no comparison group

was observed, the result remains a within-group association between the instructional period and test performance.

Table 1. Descriptive Statistics

Measure	Pretest	Posttest
Participants (n)	32	32
Mean	53.59	76.87
Standard deviation	13.984	9.483
Minimum	20	55
Maximum	75	90

Table 2. Main Inferential Results Reported

Statistic	Reported value	Interpretation
Shapiro–Wilk: pretest	$p = .321$	No evidence against normality
Shapiro–Wilk: posttest	$p = .033$	Departure from normality
Wilcoxon signed ranks	$Z = -4.955$; $p < .001$	Significant pre–post difference
Positive / negative / tied ranks	32 / 0 / 0	All observed pairs increased
N-Gain (reported)	0.4973	Moderate; recomputation advised

Table 3. Selected Indicators Transcribed from The Source Frequency Tables

Indicator	Pretests Correct (%)	Posttests Correct (%)
Information	82.81	82.81
Detailed information	52.50	86.25
Paragraph meaning	28.13	87.50
Vocabulary	18.75	72.92
Feeling/opinion	28.13	84.38
Sequence of events	40.63	59.38

Selected Reading Comprehension Indicators

Tables 1 and **2** reported correct-answer percentages for ten reading indicators. A selection is shown in **Table 3**. Vocabulary is listed as 18.75% at pretest and 72.92% at posttest, while paragraph meaning is listed as 28.13% and 87.50%, respectively.

Classroom Implementation Observations

The treatment narrative describes initial uncertainty about group responsibilities and the meanings of some text portions. In later sessions, students reportedly became more familiar with home-group and expert-group roles, made better use of worksheets, and participated more actively in explanation activities. The teacher's use of guiding questions and guessing tasks appeared to make the routines easier to follow. These observations are informative for explaining how the lesson was implemented, but they were not independently quantified through a separate validated engagement or collaboration scale and should not be presented as an additional statistically tested finding.

DISCUSSION

The principal finding is a statistically significant improvement in reading test scores across the instructional period. The paired scores were consistently higher after the lessons, and the Wilcoxon analysis showed $p < .001$. This pattern is compatible with the possibility that Jigsaw-supported reading activities contributed to learning. Nevertheless, the design cannot isolate Jigsaw from maturation, increased familiarity with assessment format, ordinary teacher support, or other concurrent influences. One plausible instructional explanation concerns positive interdependence and accountability. Students had to comprehend assigned text sections sufficiently to teach peers when returning from

expert groups to home groups. Rephrasing information for classmates may have promoted attention to main ideas, specific details, and sequence of events. Hind and Astuti (2024) similarly documented how the organization of Jigsaw roles could support participation in EFL reading instruction. Such classroom-process evidence helps interpret the present findings, but it does not substitute for a comparative experimental design.

Several studies in Indonesian EFL classrooms suggest reasons to examine peer explanation more closely. Dwiniasih and Nugraha (2019) associated Jigsaw activities with opportunities for learners to share text information; Putriani et al. (2024) connected Jigsaw and pictorial support to classroom reading tasks; and Herman et al. (2020) assessed the technique using a comparison-class design. These sources suggest hypotheses for further study, but they neither establish a mechanism in the current dataset nor remedy the absence of a control group. The interpretation should also acknowledge the heterogeneous outcomes in the wider research base. Cochon Drouet et al. (2023) reported substantial variability in Jigsaw-related outcomes across studies, and Vives et al. (2025) stressed that effects vary across contexts and types of outcomes. In this light, the observed improvement in the Tarakan class is best viewed as evidence specific to the participating group and to the instructional conditions. It supports further classroom investigation, particularly where group guidance, task clarity, and learners' prior language resources may differ.

Panggabean and Bahri (2026) examined specifically on Jigsaw and EFL reading, while Cochon Drouet et al. (2023) and Vives et al. (2025) cover heterogeneous educational outcomes. This distinction matters: evidence on overall achievement, interaction, or social outcomes should not be automatically translated into a claim about every reading-comprehension indicator. Future studies in Tarakan could also compare group-based models or include a delayed assessment to determine whether gains persist. The indicator percentages indicate that achievement was not uniform across comprehension domains. They also expose an internal reporting problem that should be resolved, not hidden. The posttest table contains high percentages for detailed information, paragraph meaning, and feeling/opinion, yet the narrative immediately it reproduces many pretest values and characterizes these domains as remaining low.

Vocabulary support is another practical consideration. In the first Jigsaw session, learners reportedly struggled with unfamiliar words and the procedural demands of explaining material to peers. The teacher subsequently added guidance and structured worksheets. Ramli, et al, (2022) showed in another EFL context that language development reflects the interaction of linguistic demands and learning opportunities; while the population was different, that observation aligns with the need to provide sufficient language scaffolding before asking students to teach one another. A stronger instructional version of Jigsaw might include explicit vocabulary previews, short model explanations, comprehension-check questions, and targeted feedback during expert-group preparation.

Reading support should address both word-level and discourse-level demands. Oakhill et al. (2015) and Vaughn et al. (2024) provide a rationale for modelling comprehension processes rather than assuming that exposure alone is sufficient. Vettori et al. (2024) likewise emphasize the interplay of language knowledge and higher-order processes in EFL reading. Accordingly, vocabulary glosses, checks for inferred meaning, and short explanation rehearsals may improve the feasibility of expert-group work, but the current study did not experimentally test these components separately.

The reported experiences also illustrate the importance of face-to-face interaction and the intentional use of supporting technologies. Ramli, et al. (2022) documented positive perspectives on blended learning in a university EFL context and discussed the instructional value of combining direct interaction with digital resources. The present study used Wordwall, videos, and teacher-made activities in some lessons, but it did not compare technology-supported Jigsaw with a non-digital condition. Consequently, the argument is only that multimedia tools may

help structure attention and engagement; it provides no basis for estimating a separate digital-media effect on reading scores.

Implementation quality further depends on teachers' preparation and classroom resources. Ramli, et al. (2025) documented the opportunities and constraints of networked technologies among EFL teachers in the Tarakan border area, including issues of facilities and teacher readiness. Those findings provide useful local context for decisions about media and lesson planning, but they do not establish the effect of Jigsaw itself. For teachers working with mixed-ability classes, practical priorities include manageable texts, clear allocation of expert roles, an explicit expectation that each learner contributes, and follow-up questions that reveal misunderstandings rather than allowing group members to remain passive.

Several limitations shape the contribution of this research. First, all 32 participants came from one class at one school, so the findings are not automatically generalizable to other cohorts. Second, there was no control group, random assignment, or delayed posttest; therefore, neither causal attribution nor long-term retention can be established. Third, the instrument-validation narrative reports expert review but not a test-reliability estimate or statistical evidence that pretest and posttest difficulty levels were equivalent.

The practical contribution, despite these limitations, is a documented set of classroom activities linking individual responsibility with collaborative meaning construction. Future research should use a comparison group, check form equivalence, and add delayed measurement. It could also collect systematic observation data about group participation, vocabulary use, and peer explanation to test mechanisms that are only suggested by the present classroom narrative. Such extensions would clarify under what conditions Jigsaw-supported instruction is most effective for EFL reading in schools with diverse learning needs and resources.

CONCLUSION

This study found a significant increase in ninth-grade students' reading comprehension scores after an instructional period using the Jigsaw Learning Model at SMPN 1 Tarakan. The descriptive-statistics table reported mean scores of 53.59 before instruction and 76.87 afterward; all 32 learners had higher posttest scores, and the Wilcoxon signed-rank test showed a significant difference ($Z = -4.955$, $p < .001$). The lessons provided opportunities for students to discuss assigned reading material in expert groups and communicate their understanding within home groups. These findings support further use and investigation of structured cooperative reading activities, but they do not prove that Jigsaw alone caused the score gains. For classroom practice, teachers should demonstrate the grouping procedure, model expected explanations, monitor equal participation, and support vocabulary and text interpretation. Future studies should incorporate a comparison class, more systematic observation measures, and a delayed posttest.

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