

The Effectiveness of the Integrated BBT Method (Read-Tiered-Structured) in Improving Reading Literacy among Elementary School Students: A Quasi-Experimental Study

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Abstract

This study aims to evaluate the effectiveness of the Integrated BBT Method (Reading-Tiered-Structured) in improving elementary school students' reading literacy. The research employed a quantitative, quasi-experimental one-group pre-test-post-test design involving 56 students from Grades I–VI at SD Inpres Bone, South Central Timor Regency, East Nusa Tenggara, using a saturated sampling technique. The intervention was implemented over four weeks in sequential stages: reading letters, words, sentences, and paragraphs. The research instrument consisted of a reading literacy test developed by the Ministry of Education, Culture, Research, and Technology (Kemdikbudristek), and data were analyzed using a paired-samples t-test. The results indicated a significant improvement in reading literacy, with a significance value (2-tailed) of 0.000 (< 0.05). The t-values across the five levels were -18.044, -37.293, -30.529, -15.152, and -13.550, respectively, with 55 degrees of freedom. The effect size values at the five levels were 3.151571, 6.721453, 5.412058, 2.563162, and 2.281976, respectively, with average post-test achievement exceeding 97% across all levels. The limitations of this study include the absence of a control group and the short duration of the intervention. Theoretically, these findings strengthen the effectiveness of a staged literacy approach, while practically, they provide an applicable model for reading instruction. This study recommends implementing the Integrated BBT Method to strengthen reading literacy policy in Indonesian elementary schools.

Keywords: elementary school students, integrated BBT method, quasi-experimental study, reading literacy

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INTRODUCTION

Reading literacy is a fundamental foundation for mastering 21st-century competencies and a prerequisite for elementary school students' success in learning various subjects (Anggraini et al., 2025; Noveliana & Ghani, 2022). However, various national and international evaluations indicate that the reading literacy skills of elementary school students in Indonesia remain low, particularly in understanding textual meaning, connecting information, and drawing conclusions from texts (Juariah, 2024; Tahmidaten & Krismanto, 2020; Sulfa et al., 2023). Data from the Progress in International Reading Literacy Study (PIRLS) place the reading ability of Indonesian fourth-grade students 41st among 45 participating countries. Findings from the Indonesian Student Competency Assessment (Asesmen Kompetensi Siswa Indonesia/AKSI), also known as the Indonesia National Assessment Program (INAP), reveal that 46.83% of students demonstrate weak reading skills, accompanied by weaknesses in mathematics and science (Dayantri & Nasution, 2024; Nirmala, 2025). In line with these findings, the 2023 National Assessment indicates that 61.53% of elementary school students have not yet achieved the minimum competency in reading literacy (Nadda, 2025). This condition indicates that the reading abilities of elementary school students have not yet fully reflected comprehensive and sustainable reading skills.

The problem of low literacy ability is influenced by weak foundational training, learning practices that emphasize theory over practice, and inadequate instructional planning (Santos, 2024; Oliveira et al., 2025). This condition causes the learning process to occur in a fragmented, mechanical manner, thereby hindering students from developing reading and writing skills optimally (Yosoa et al., 2024). In addition, reading instruction still frequently focuses on letter recognition and word pronunciation without being balanced by meaning-making at the sentence and paragraph levels (Crawford et al., 2023). As a result, students can read technically but are not yet capable of comprehensively understanding the content of texts. Limited access to reading facilities (such as libraries, reading corners, and age-appropriate reading materials), as well as the implementation of literacy strategies that are insufficiently structured and lack innovation by teachers, also contribute to weak literacy outcomes (Mutadin, 2024; Susanti, 2025). This situation indicates a gap between early reading skills and reading comprehension abilities, which should ideally develop in an integrated manner.

Theoretically, reading literacy is a gradual, continuous process that begins with letter recognition, progresses to word formation, sentence comprehension, and ultimately to paragraph interpretation (Muñoz et al., 2021). Constructivist theory emphasizes that reading comprehension is formed through an active process in which students construct meaning based on their experiences and systematically learned language structures (Mugambi, 2018). Therefore, reading instruction needs to be designed in an integrated manner so that each stage supports and reinforces the others.

The Integrated “BBT” (*Baca–Berjenjang–Terstruktur* or Reading-Progressive-Structured) Method is grounded in this theoretical framework by positioning reading as a unified, hierarchical process. At the letter-reading stage, students strengthen letter recognition and mastery; this is followed by syllable and word reading, which emphasize word formation and the recognition of word meaning. The first and second stages of reading comprehension focus on understanding relationships among words within sentences and on guiding students to identify main ideas as well as explicit and implicit information in paragraphs. The integration of these stages is expected to foster the development of reading skills holistically.



In line with the theoretical framework that conceptualizes reading as a hierarchical and integrated process, numerous previous studies have examined the effectiveness of specific strategies and methods in improving students' reading abilities. Arifuddin (2025) demonstrated that implementing the PQ4R strategy significantly enhanced students' reading comprehension, particularly in descriptive and narrative texts. Although students' scores varied across learning cycles, the consistent application of the strategy yielded a positive impact on learning outcomes. Similarly, Nurmahanani (2023) reported that a mixed-methods literacy program had a significant effect on all aspects of students' reading abilities, including word-reading efficiency, reading comprehension, and reading fluency. Comparable findings were also reported by Balas and Sambo (2023) using the RARS strategy, which showed an increase in the number of students able to read independently and a decrease in the number experiencing reading difficulties. Therefore, an integrated BBT method remains necessary to bridge all levels of reading in a continuous, coherent manner.

The identified research gap lies in the absence of a reading instruction model that explicitly and hierarchically integrates the stages of letters, syllables, words, sentences, and paragraphs (reading comprehension) within a single, structured methodological approach, particularly in the context of Indonesian elementary schools. The novelty of this study lies in the development and implementation of the Integrated BBT Method, which unifies all stages of reading into a coherent, contextualized instructional framework oriented toward meaning-making from the early stages of reading.

Based on this background, the study is formulated around the following research questions: (1) Does the implementation of the Integrated BBT Method significantly improve elementary school students' reading abilities in terms of letters, syllables, words, sentences, and paragraphs? and (2) How does the pattern of improvement in students' reading abilities at each reading stage manifest after the implementation of the Integrated BBT Method? These questions can be examined through quantitative, structured measures of students' reading achievement at each reading level. This study holds both theoretical and practical significance. Theoretically, it contributes to the development of a reading instruction model that emphasizes the hierarchical integration of reading stages within a single methodological framework. Practically, the study is expected to provide an applicable solution for elementary school teachers, particularly in remote areas, in designing systematic, easily implementable, and effective reading instruction to enhance students' reading literacy.

METHOD

This study employed a quantitative approach using a one-group pretest–posttest design. This design was selected due to field constraints, particularly the limited number of students and the impracticality of forming an equivalent control group. Although no comparison group was included, this design allows the researcher to objectively measure changes in students' reading literacy skills by comparing scores obtained before (pretest) and after (posttest) the intervention.

The study was conducted at SD Inpres Bone, located in South Central Timor (TTS) Regency, East Nusa Tenggara, Indonesia. The sampling technique employed was saturated sampling, in which all members of the population were included as research participants, given the relatively limited population size (Sugiyono, 2017). The total sample consisted of 56 students from Grades 1 to 6, aged 6 to 12 years. Most students came from rural socio-demographic backgrounds, with parents predominantly working



as farmers and having limited access to reading materials. All students were treated as a single experimental group, without subdivision into smaller groups, and were under intensive supervision throughout the intervention to ensure consistent implementation of the method.

The reading literacy instrument comprises several components, as follows: (a) a letter reading test consisting of 30 letters to assess mastery of basic phonemic awareness; (b) a syllable and word reading test consisting of 15 syllables and 20 words to measure early decoding ability; (c) a fluent reading test (Type 4A) consisting of 14 sentences with a total of 85 words, designed to assess fluency in reading simple sentences; and (d) a fluent reading test (Type 4B) consisting of three interrogative sentences with a total of 16 words, aimed at measuring basic reading comprehension. An example item on the word-reading test required students to read simple words aloud in sequence. Scores were assigned based on accuracy and reading fluency. In addition, an observation sheet was used to record students' engagement, reading activities, and responses during the implementation of the BBT method.

The intervention was carried out using the BBT (Read-Tiered-Structured) method for four weeks, with the following procedural details:

- 1) Pre-Intervention Stage (Week 0): Students were administered a reading literacy pretest to identify baseline reading abilities across all grade levels. The test was conducted individually and facilitated by the teacher or a trained facilitator.
- 2) The intervention was implemented over a four-week period, consisting of three to four sessions per week, with each session lasting approximately 30–40 minutes. The intervention followed a structured progression as outlined below: Week 1 focused on letter reading; Week 2 on syllable and word reading; Week 3 on sentence reading; and Week 4 on reading simple paragraphs. The teacher or facilitator served as the primary guide, providing reading demonstrations, leading gradual practice activities, and delivering immediate feedback to students. Instructional materials included letter cards, word cards, simple reading books, a whiteboard, and student worksheets. The entire instructional process was monitored using a fidelity checklist to ensure that the intervention was implemented in accordance with the BBT protocol.
- 3) Post-Intervention Stage: After the completion of the entire intervention sequence, students were administered a reading literacy posttest using the same instrument as the pretest in order to measure improvements in reading ability.

Data were analyzed using descriptive statistics to describe students' reading literacy abilities before and after the intervention. To examine differences between pretest and posttest scores, a paired-samples *t*-test was employed. Prior to conducting the *t*-test, the assumption of normality was assessed using normality tests (Kolmogorov–Smirnov and Shapiro–Wilk). If the data were not normally distributed, the Wilcoxon Signed-Rank Test was applied as a nonparametric alternative. All statistical analyses were performed using IBM SPSS version 25, with a significance level set at $\alpha = 0.05$.

RESULTS AND DISCUSSION

Result

In general, the research results showed an increase in students' reading literacy skills at all levels (Levels 1-5) after implementing the Integrated BBT (Read-Tiered-Structured) method. This improvement was evident in the average scores, achievement percentages, and distribution of student scores at each level.



Description of Students' Reading Literacy Abilities Before Intervention (Pre-test)

The results of the reading literacy pre-test indicate that the reading ability of Bone Inpres Elementary School students remains in the low-to-moderate range. Reading difficulties are evident in letter recognition, word reading, sentence fluency, and paragraph comprehension.

Table 1.
 Student Pre-test Results (n=56)

Student	Level/Test					Total	Student	Level/Test					Total
	I	II	III	IV	V			I	II	III	IV	V	
IS1	10	5	9	30	-	54	IVS5	10	5	9	30	13	67
IS2	8	6	10	33	6	63	IVS6	8	6	10	33	13	67
IS3	5	7	10	32	-	54	IVS7	5	7	10	32	13	100
IS4	7	7	8	30	-	52	IVS8	7	7	8	65	12	98
IS5	8	8	7	26	6	55	IVS9	8	8	7	63	12	104
IS6	9	7	8	31	5	60	IVS10	9	7	8	68	13	104
IIS1	10	5	9	30	7	54	IVS11	10	5	9	67	13	105
IIS2	8	6	10	33	5	62	IVS12	8	6	10	68	13	121
IIS3	5	7	10	32	7	61	VS1	21	7	10	70	13	116
IIS4	7	7	8	30	5	57	VS2	20	8	8	67	13	118
IIS5	8	8	7	26	7	56	VS3	22	9	7	67	13	121
IIS6	7	7	8	30	3	55	VS4	23	9	7	69	13	120
IIS7	9	5	9	20	7	50	VS5	25	7	8	67	13	123
IIS8	5	5	4	25	5	44	VS6	24	8	9	69	13	124
IIS9	7	7	8	20	6	48	VS7	22	9	10	70	13	123
IIS10	8	6	10	33	6	63	VS8	22	10	10	68	13	119
IIIS1	10	5	9	30	7	61	VS9	23	8	8	67	13	117
IIIS2	8	6	10	33	5	62	VS10	22	8	7	67	13	137
IIIS3	5	7	10	32	7	61	VIS1	23	10	14	77	13	135
IIIS4	7	7	8	30	5	57	VIS2	22	7	16	77	13	137
IIIS5	8	8	7	26	7	56	VIS3	22	8	16	78	11	116
IIIS6	7	7	8	30	3	55	VIS4	22	9	7	67	13	121
IIIS7	9	5	9	20	7	50	VIS5	23	9	7	69	13	120
IIIS8	5	5	4	25	5	44	VIS6	25	7	8	67	13	123
IIIS9	7	7	8	20	6	48	VIS7	24	8	9	69	13	124
IIIS10	8	6	10	33	6	63	VIS8	22	9	10	70	13	124
IVS1	20	8	7	42	7	84							
IVS2	15	7	8	52	8	90							
IVS3	17	11	9	50	10	97							
IVS4	19	10	4	40	10	83							



Table 2.
 Recap of Overall Pre-Test Results

Level/Test	Total Value	Grade Average	Percentage (%)
Level 1	738	13,18	43.93 %
Level 2	403	7,20	47.98 %
Level 3	521	9,30	46.52 %
Level 4	2605	46,52	54.73 %
Level 5	502	9,47	56.03 %

Based on the pre-test results of 56 students in grades I-VI, reading ability is generally still in the moderate and developing category. The average score for Levels 1–3 is low to moderate (43.93%–47.98%), indicating that some students still have difficulty with basic reading skills. Meanwhile, Levels 4-5 experienced an increase (54.73% and 56.03%), indicating that the reading ability of upper-grade students is starting to improve, although not evenly. These results indicate the need for gradual, continuous strengthening of reading instruction, especially in lower grades.

Integrated Method Intervention BBT (Structured-Leveled-Reading)

The research intervention was conducted for three weeks using the Integrated BBT (Leveled-Structured Reading) Method, implemented by the researcher and the class teacher. Reading activities were carried out in stages according to the students' abilities, starting with recognizing letters, reading syllables, and reading comprehension, and progressing to answering questions. The learning was structured and implemented routinely under teacher guidance. The implementation of the Integrated BBT (Leveled-Structured Reading) Method showed excellent results, as evidenced by increases in post-test scores across all test levels. The greatest increase occurred in basic reading skills, indicating that gradual, structured reading instruction is effective in improving students' literacy, especially among those with low initial abilities.

Description of Students' Reading Literacy Abilities Before Intervention (Pre-test)

The post-test results on reading ability indicate that the reading ability of Bone Inpres Elementary School students is beginning to improve. The results for each student's improvement are shown in the table below.

Table 3.
 Student Post-test Results (n=56)

Student	Level/Test					Total	Student	Level/Test					Total
	I	II	III	IV	V			I	II	III	IV	V	
IS1	28	13	19	80	14	154	IVS5	30	15	20	85	16	166
IS2	29	13	18	80	14	154	IVS6	30	15	20	85	16	166
IS3	28	13	19	80	14	154	IVS7	30	15	20	85	16	166
IS4	28	13	19	80	14	154	IVS8	30	15	20	85	16	166
IS5	28	13	19	80	14	154	IVS9	30	15	20	85	16	166
IS6	28	13	17	80	14	152	IVS10	30	15	20	85	16	166
IIS1	29	15	18	80	14	156	IVS11	30	15	20	85	16	166
IIS2	29	15	19	80	14	157	IVS12	30	15	20	85	16	166
IIS3	28	15	19	80	14	156	VS1	30	15	20	85	16	166
IIS4	28	15	18	80	14	155	VS2	30	15	20	85	16	166



IIS5	28	15	19	80	16	158	VS3	30	15	20	85	16	166
IIS6	27	15	18	80	16	156	VS4	30	15	20	85	16	166
IIS7	26	15	19	80	16	158	VS5	30	15	20	85	16	166
IIS8	28	15	18	80	16	157	VS6	30	15	20	85	16	166
IIS9	28	15	19	80	16	158	VS7	30	15	20	85	16	166
IIS10	28	15	19	80	16	158	VS8	30	15	20	85	16	166
IIS1	30	15	18	80	16	159	VS9	30	15	20	85	16	166
IIS2	30	15	20	80	16	161	VS10	30	15	20	85	16	166
IIS3	30	15	19	80	16	160	VIS1	30	15	20	85	16	166
IIS4	30	15	20	81	16	162	VIS2	30	15	20	85	16	166
IIS5	28	15	20	80	16	159	VIS3	30	15	20	85	16	166
IIS6	30	15	20	82	16	163	VIS4	30	15	20	85	16	166
IIS7	30	15	20	80	16	161	VIS5	30	15	20	85	16	166
IIS8	28	15	20	82	16	161	VIS6	30	15	20	85	16	166
IIS9	28	15	20	82	16	161	VIS7	30	15	20	85	16	166
IIS10	30	15	20	82	16	163	VIS8	30	15	20	85	16	166
IVS1	30	15	20	83	16	164							
IVS2	30	15	20	83	16	164							
IVS3	30	15	20	83	16	164							
IVS4	30	15	20	83	16	164							

Table 4.
 Recap of Overall Post-Test Results

Level/Test	Total Value	Grade Average	Percentage (%)
Level 1	1644	29,36	97,86%
Level 2	828	14,79	98,57%
Level 3	1094	19,54	97,68%
Level 4	4631	82,70	97,29%
Level 5	876	15,64	97,77%

Based on the post-test results in Tables 3 and 4, the reading ability of 56 students in grades I-VI showed a very significant increase across all test levels. The summary of the results shows that the average score at Levels 1 to 5 is in the very high category, with achievement percentages above 97% at each level, ranging from 97.29% to 98.57%. This indicates that almost all students have mastered the reading skills appropriate to their grade level, including basic reading, comprehension, and reading fluency. The relatively even scores between students and across levels also indicate that the intervention or learning provided is effective in improving students' reading abilities overall. Thus, the post-test results confirm the very good development of reading abilities compared to the students' initial conditions during the pre-test.



Table 5.
 Comparison of Pre-test and Post-test Results of Students' Reading Ability

Level/Test	Pre-test Average	Post-test Average	Increase difference	Percentage Increase
Level 1	13,18	29,36	16,18	122,76%
Level 2	7,20	14,79	7,59	105,42%
Level 3	9,30	19,54	10,24	110,11%
Level 4	46,52	82,70	36,18	77,77%
Level 5	9,47	15,64	6,17	65,15%

Table 5 shows an increase in students' reading ability at all levels after learning, as indicated by the higher average post-test score compared to the pre-test. The highest percentage increase occurred at Level 1 (122.76%), followed by Level 3 (110.11%) and Level 2 (105.42%), indicating the effectiveness of learning, especially for students with low initial abilities. Meanwhile, Level 4 showed the largest absolute difference in improvement (36.18 points), but the percentage increase was lower (77.77%) due to the high initial abilities. Level 5 showed the smallest increase (65.15%), suggesting that at higher levels of reading ability, more intensive learning strategies are needed to achieve optimal results.

Referring to the table, to find out the various simple differences between the pre- and post-test, you can see the figure below:

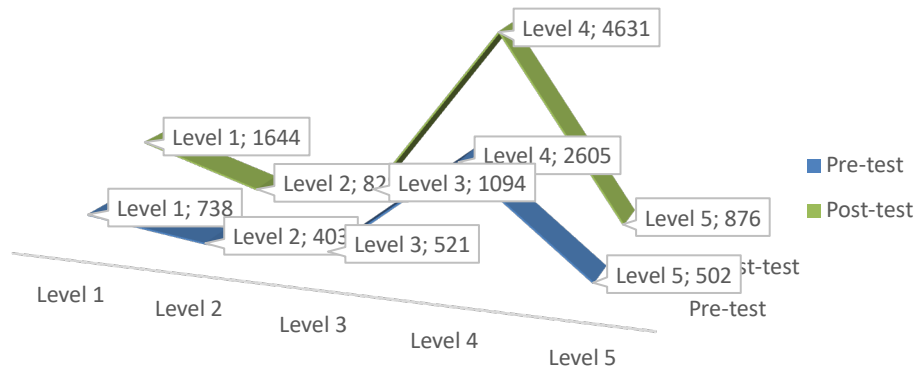


Figure 1. Difference in Total Scores of Pre-Test and Post-Test Results

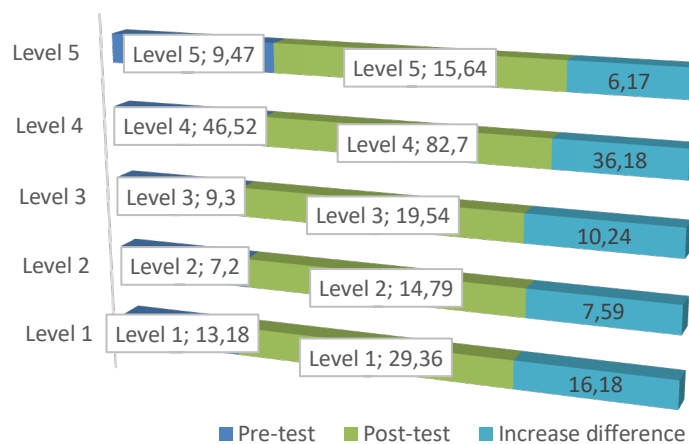


Figure 2. Comparison of Pre-test and Post-test Results



Hypothesis Test Results

The results of the normality test showed that the difference between pre-test and post-test scores was normally distributed ($p > 0.05$). Therefore, the analysis was continued with a paired-samples t-test.

Table 6.
 Result Paired Sample Test & Cohen's Effect Size

Level/Test	t-value	df	Sig. (2-tailed)	Cohen's <i>d</i>
Level 1	-18.044	55	0,000	3.151571
Level 2	-37.293	55	0,000	6.721453
Level 3	-30.529	55	0,000	5.412058
Level 4	-15.152	55	0,000	2.563162
Level 5	-13.550	55	0,000	2.281976

Based on the results of the normality test, the differences between pre-test and post-test scores at all levels were normally distributed ($p > 0.05$); therefore, the analysis was continued with a paired-samples t-test. The results indicated that for Levels 1 through 5, the significance values (Sig. (2-tailed)) were 0.000 ($p < 0.05$), demonstrating statistically significant differences between pre-test and post-test scores across all measurement levels. The negative t-values at each level indicate that the mean post-test scores were higher than the mean pre-test scores, suggesting an improvement in participants' performance following the intervention. Thus, these findings confirm that the implemented intervention was effective in enhancing outcomes across all tested levels. In addition, based on Cohen's effect size values, it can be concluded that the effect of the intervention on the development of children's reading ability is very large across all levels ($d > 0.8-1.2$).

Discussion

The research results showed a significant improvement in elementary school students' reading literacy skills after the learning intervention. This improvement was evident across all test levels, from Level 1 to Level 5, encompassing basic reading, fluency, and reading comprehension. These findings indicate that the intervention addressed the reading literacy challenges previously experienced by students.

The pre-test results indicate that students' reading literacy skills fall within the low to moderate categories, particularly at Levels 1 to 3, which include letter recognition, word reading, and basic comprehension. This condition is consistent with Chall's theory of early reading development, which posits that during the initial stage of reading (learning to read), students often experience difficulties with decoding and word recognition if they do not receive systematic instruction and stimulation (Nugraha & Nurani, 2023). In addition, these findings support the study by Silverman et al. (2021), which explains that weak foundational reading skills in the early grades can lead to difficulties in advanced reading at higher grade levels. The low achievement of students at the initial levels indicates that they require structured, continuous reading instruction to reach the stage of reading to learn (Tomas et al., 2021).

The post-test results demonstrate a very significant improvement across all test levels, with achievement percentages exceeding 97%. Nearly all students reached the very high category, and the improvement occurred evenly across all grade levels. These findings indicate that the implemented instructional intervention was effective in enhancing students' reading literacy skills. This success suggests that students received



learning support aligned with their needs and proficiency levels, thereby optimizing the learning process (Ramdani et al., 2022). Furthermore, students' active engagement during instruction is believed to have played a crucial role in promoting overall improvements in reading ability.

Theoretically, these results are consistent with Vygotsky's constructivist theory, particularly the concept of the Zone of Proximal Development (ZPD). Appropriate instructional interventions provide students with assistance (scaffolding), enabling them to achieve higher levels of reading ability than their initial performance (Wibowo et al., 2025). On the other hand, Sandy and Fidian (2022) argue that effective reading instruction promotes active and meaningful student engagement. The uniform improvement across all levels indicates that the instructional strategies employed not only enhanced students' technical reading skills but also improved their reading comprehension and motivation.

The research findings indicate that the highest percentage gains occurred at Levels 1, 2, and 3. This suggests that the intervention was highly effective for students with low initial reading abilities. These findings are consistent with Bowers (2020) assertion that explicit and systematic reading instruction has a strong impact on beginning readers, as it helps them develop phonological skills and word recognition. Meanwhile, Levels 4 and 5 also demonstrated significant improvement, although with lower percentage gains. This is in line with the Direct and Indirect Effects Model of Reading (DIER), which emphasizes that reading skills develop progressively, whereby higher-level reading abilities require more complex cognitive processes such as making inferences, understanding perspectives, reasoning, and monitoring comprehension (Kim, 2020). This indicates that reading skills evolve hierarchically. Therefore, although the percentage increase was lower, the substantial absolute gain at Level 4 reflects the intervention's success in strengthening reading comprehension among upper-grade students.

The results of the paired-sample t-test indicate a statistically significant difference between students' reading abilities before and after the intervention across all levels (Sig. = 0.000 < 0.05). Theoretically, this finding reinforces the view that reading literacy does not develop naturally without intervention but instead requires systematically designed instruction (Horowitz-Kraus et al., 2017). These findings also support the results of previous research indicating that appropriate reading-learning interventions can significantly improve the literacy of primary school students (Graham & Kelly, 2018; Gersten et al., 2020).

Based on the findings and theoretical review, it can be concluded that structured, progressive, and continuous reading instruction is essential for improving students' reading literacy skills. The intervention was not only effective for students in the lower grades but also capable of strengthening higher-level reading abilities among upper-grade students. Therefore, the implementation of systematic reading instruction strategies should be made an integral part of teaching and learning in elementary schools.

CONCLUSION

Based on the research findings, it can be concluded that the implementation of the Integrated BBT Method (Read-Tiered-Structured) not only improves students' reading literacy scores at SD Inpres Bone but also demonstrates a step-by-step learning approach aligned with students' reading development. The greatest improvement was observed in early reading skills, indicating that this method is particularly effective for students with low initial reading ability. These findings highlight the importance of structured and continuous reading instruction in elementary schools. For future research, it is strongly



recommended to conduct studies using more rigorous designs, such as randomized controlled trials (RCTs), involving larger and more diverse samples from various regions across Timor Island, East Nusa Tenggara, and not limited to South Central Timor (TTS), as well as different socioeconomic backgrounds, and to examine the long-term sustainability of learning outcomes. From a practical perspective, teacher training is necessary to ensure that the BBT Method can be implemented more widely and consistently. In addition, this method should be considered for integration into the national curriculum to support improvements in reading literacy in elementary schools.

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