



Revitalizing Gorontalo Vocabulary through Bilingual Comics in Coastal Environmental Contexts

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Article Info	Abstract
Received: 2026 - 06- 01	<i>The declining use of regional languages among children has become a growing concern in Indonesian communities, including Gorontalo, where intergenerational language transmission is increasingly disrupted by the dominance of national and global languages. Despite existing studies on comic-based learning and bilingual instruction, research integrating bilingual comics with local environmental contexts specifically for regional language revitalization among children remains limited. This study aims to examine the effectiveness of bilingual comic-assisted learning with coastal environmental contexts in improving children's Gorontalo vocabulary acquisition. A pre-experimental one-group pretest-posttest design was employed involving 15 children aged 8–10 years in a coastal community of Gorontalo. Data were collected through validated vocabulary tests administered before and after two learning sessions using the bilingual comic Perahu dan Rahasia Air. The findings revealed substantial improvement: mean pretest score was 3.40, increasing to 8.87 posttest (mean gain = 5.47). A Wilcoxon signed-rank test confirmed the improvement was statistically significant ($Z = -3.41, p < 0.001$). Before the intervention, 73.3% of participants belonged to poor or very poor categories; after the intervention, 93.3% reached good or very good categories. The novelty of this study lies in its integration of bilingual comics, contextual environmental narratives, and regional language revitalization within children's literacy practices. Findings suggest that culturally grounded bilingual visual media can support vocabulary acquisition and contribute meaningfully to regional language revitalization efforts. Limitations related to sample size and intervention</i>
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duration are acknowledged, and directions for future research are discussed.

1. Introduction

Regional languages in Indonesia continue to experience gradual decline due to the increasing dominance of national and global languages in children's daily communication. In many communities, younger generations are becoming less familiar with local vocabulary because regional languages are rarely integrated into contemporary learning media. This condition also affects the Gorontalo language, particularly among children living in urban and coastal environments where Indonesian is more frequently used in educational and social interactions.

The Gorontalo language is spoken by approximately 1 million people and serves as an important marker of cultural identity for the Gorontalo community in Gorontalo Province. However, recent sociolinguistic trends indicate a significant language shift, particularly among younger generations. Urban migration, increased exposure to Indonesian-language digital media, and the marginalization of regional languages in formal education have accelerated vocabulary loss and reduced active use of Gorontalo among children. If this trend continues, the language risks transitioning from active community use to passive cultural symbol within one to two generations (UNESCO, 2003; Ethnologue, 2023).

In the context of regional language preservation, children occupy an

important position because language sustainability depends largely on intergenerational transmission within families and communities. However, many regional languages in Indonesia are increasingly absent from children's learning environments due to the dominance of formal Indonesian instruction and digital entertainment media. As a result, children often recognize regional languages only as passive cultural symbols rather than active means of communication. This condition indicates the urgent need for learning media capable of repositioning regional languages within children's contemporary literacy experiences.

Previous studies have emphasized the importance of innovative learning media in supporting children's vocabulary development and literacy engagement. Comics have been recognized as effective visual learning media because they combine illustrations, dialogues, and narratives that help learners understand vocabulary within meaningful contexts (Nafisa et al., 2021; (Nishonova, 2024). Visual narratives also encourage children's reading motivation because images and storylines help learners process information more naturally and enjoyably (Krashen, 2004; Mayer, 2009). In language learning contexts, vocabulary acquisition becomes more effective when learners encounter words repeatedly through contextualized materials rather than isolated memorization practices (Nation, 2013).

Several studies have also shown that bilingual learning materials can support language comprehension by connecting familiar language forms with unfamiliar vocabulary (Van Horn & Kan, 2016; Saleem & Khan, 2024). Bilingual materials allow learners to construct meaning gradually while reducing anxiety when encountering new linguistic forms. Furthermore, contextual learning environments related to children's surroundings can strengthen vocabulary retention because learners associate language with concrete experiences and social realities (Vygotsky, 1978; (Piaget, 1972).

Language revitalization frameworks emphasize that endangered languages require active community-based interventions that embed the language within meaningful social and cultural practices (Fishman, 1991; (Hinton & Hale, 2001). Effective revitalization efforts for children must go beyond passive exposure and create opportunities for active vocabulary use within culturally familiar and emotionally engaging contexts. In this regard, visual narrative media offer a promising platform because they can present regional language vocabulary within dynamic social situations that children can observe, interpret, and relate to in their everyday experiences.

Despite these developments, previous studies generally focused on comic-based learning, bilingual instruction, or contextual learning separately. Research integrating bilingual comics with local environmental contexts for regional language revitalization remains limited. Existing studies mostly discuss English vocabulary acquisition through digital comics and visual media rather than regional language revitalization grounded in local ecological contexts (Mubarok et

al., 2023); Ariyani & Setyawan, 2024). In addition, regional language learning in Indonesia still relies heavily on conventional textbook-oriented instruction with limited use of contextual visual narratives.

This study introduces bilingual comic-assisted learning using the comic *Perahu dan Rahasia Air* as a contextual medium for Gorontalo vocabulary acquisition among children. The comic combines Indonesian and Gorontalo languages through stories related to rivers, floating objects, waste pollution, and environmental awareness. By integrating visual narratives, bilingual vocabulary exposure, and local environmental contexts, the learning activities create meaningful experiences closely connected to children's daily lives.

The conceptual framework of this study links four interconnected components: (1) bilingual comics as visual multimodal learning media; (2) contextual environmental learning grounded in local coastal settings; (3) Gorontalo vocabulary acquisition through repeated and meaningful exposure; and (4) regional language revitalization through culturally embedded literacy practices. This integration is designed to ensure that vocabulary learning is not only academically effective but also culturally situated and emotionally meaningful for young learners.

Accordingly, this study is guided by the following research questions: (1) To what extent does bilingual comic-assisted learning with coastal environmental contexts improve Gorontalo vocabulary acquisition among children aged 8–10 years? (2) Is the vocabulary improvement statistically significant? (3) How does the intervention shift participants from lower to higher vocabulary mastery categories?

2. Method

This study employed a pre-experimental research design using a one-group pretest-posttest approach (Creswell, 2014). This design was selected because the study constitutes a preliminary, community-based investigation aimed at examining initial evidence of the intervention's effectiveness before a more rigorous experimental design is pursued. Given the limited participant availability in the target community and the exploratory nature of the study, a one-group design was considered appropriate and ethically feasible. The absence of a control group is acknowledged as a methodological limitation that restricts causal inference, and future studies should incorporate comparison groups to strengthen the validity of findings.

The participants consisted of 15 children aged 8–10 years who participated in community-based learning activities in a coastal area of Gorontalo. The participants were selected purposively based on their involvement in the learning program and their limited prior exposure to Gorontalo vocabulary learning materials. While the sample size is acknowledged as a limitation that affects the generalizability of findings, this study is intended as an exploratory investigation

to document preliminary evidence of the intervention's effectiveness in a natural community learning context.

The learning media used in this study was a bilingual comic entitled *Perahu dan Rahasia Air*. The comic presented Indonesian and Gorontalo vocabulary through illustrated narratives related to rivers, floating objects, boats, waste pollution, and environmental cleanliness. Several Gorontalo vocabularies introduced in the comic included *bulotu* (boat), *taluhu* (water), *puputo* (waste), *dutula* (river), and *beresi* (clean). The comic also contained a bilingual glossary section to strengthen vocabulary recognition and recall. The learning material was designed according to principles of contextual language learning and visual literacy development (Tomlinson, 2011); Mayer, 2009).

Before implementation, the comic and vocabulary test instruments were reviewed by two language education practitioners to assess content validity, vocabulary appropriateness, readability, and contextual relevance for children aged 8–10 years. The content validity ratio (CVR) was calculated based on reviewers' evaluations, and all ten vocabulary items retained in the final test met the minimum CVR threshold. To assess instrument reliability, a Kuder-Richardson Formula 20 (KR-20) reliability coefficient was computed using pilot test data, yielding a reliability index of 0.78, which is considered acceptable for classroom-level assessments (Fraenkel et al., 2012). Minor revisions were made regarding wording clarity and vocabulary familiarity prior to the learning sessions.

Data were collected through vocabulary tests administered before and after the intervention. The pretest aimed to identify participants' initial understanding of Gorontalo vocabulary, while the posttest measured vocabulary acquisition after the learning activities. Each test consisted of ten vocabulary items requiring participants to identify and translate Indonesian vocabulary into Gorontalo. Each correct answer received one point, resulting in a maximum score of ten.

The learning activities were conducted through shared comic reading, guided storytelling, vocabulary discussions, matching games, and environmental reflection activities. The intervention was conducted in two learning sessions, each lasting approximately 60 minutes, in an informal community learning setting. The facilitator followed a structured activity sequence: (1) pre-reading vocabulary introduction, (2) shared comic reading, (3) vocabulary discussion and matching games, (4) glossary review, and (5) reflection and oral vocabulary repetition.

The collected data were analyzed using both descriptive and inferential statistics. Descriptively, pretest and posttest scores were compared using mean scores and category distributions. Participants' scores were classified into five categories: very poor (0–2), poor (3–4), moderate (5–6), good (7–8), and very good (9–10). For inferential analysis, a Wilcoxon signed-rank test was conducted to determine whether the improvement from pretest to posttest was statistically significant. The Wilcoxon test was selected as a non-parametric alternative to the paired-sample t-test given the small sample size ($n = 15$) and non-normal

distribution of pretest scores.

3. Result

The findings demonstrated considerable improvement in participants' Gorontalo vocabulary mastery after the implementation of bilingual comic-assisted learning activities. Initial pretest results showed that most participants had limited familiarity with Gorontalo vocabulary. Scores ranged from 2 to 5, indicating that participants generally belonged to poor and very poor categories. Table 1 presents participants' pretest and posttest scores.

Table 1. Participants' Pretest and Posttest Scores

No. Peserta Didik	Pretest	Posttest
1	4	9
2	3	10
3	5	7
4	3	10
5	2	8
6	3	10
7	3	8
8	5	8
9	5	10
10	2	6
11	2	10
12	2	10
13	3	9
14	5	10
15	4	8



Figure 1. The implementation of Gorontalo vocabulary introduction and revitalization activities through bilingual comic-assisted learning media.

Figure 1. Comparison of Pretest and Posttest Scores per Participant

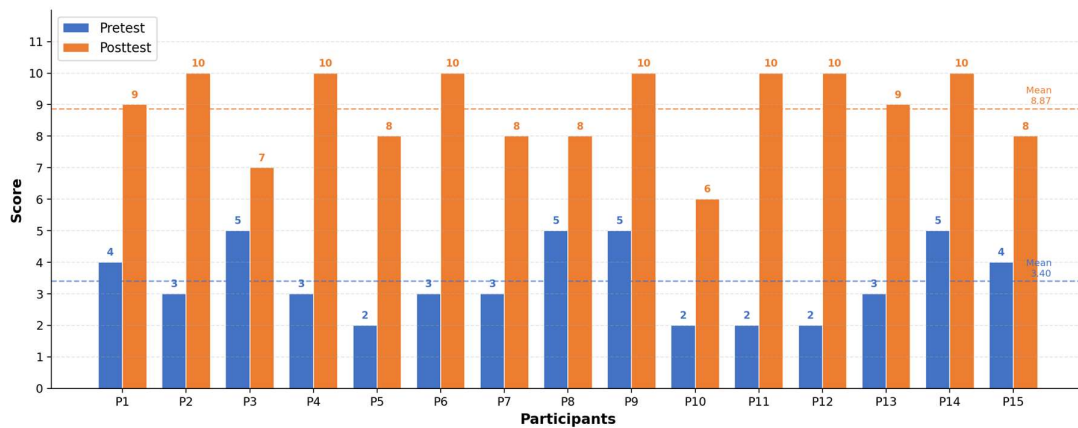


Figure 2. Comparison of Pretest and Posttest Scores per Participant.

The mean pretest score was 3.40, indicating low initial mastery of Gorontalo vocabulary among participants. After participating in bilingual comic-assisted learning activities, the mean posttest score increased to 8.87, representing a mean gain of 5.47 points. A Wilcoxon signed-rank test was conducted to evaluate the statistical significance of this improvement. The test yielded $Z = -3.41$ ($p < 0.001$), confirming that the vocabulary improvement from pretest to posttest was statistically significant at the 0.001 level. Since all 15 participants showed positive gains (no ties or negative differences), the sum of negative ranks was $W^- = 0$, indicating uniform directional improvement across the entire sample.

Table 2. Distribution of Score Categories

Category	Pretest	Posttest
Very Good	0	8
Good	0	5
Moderate	4	2
Poor	7	0
Very Poor	4	0

Figure 2. Distribution of Participants by Vocabulary Mastery Category

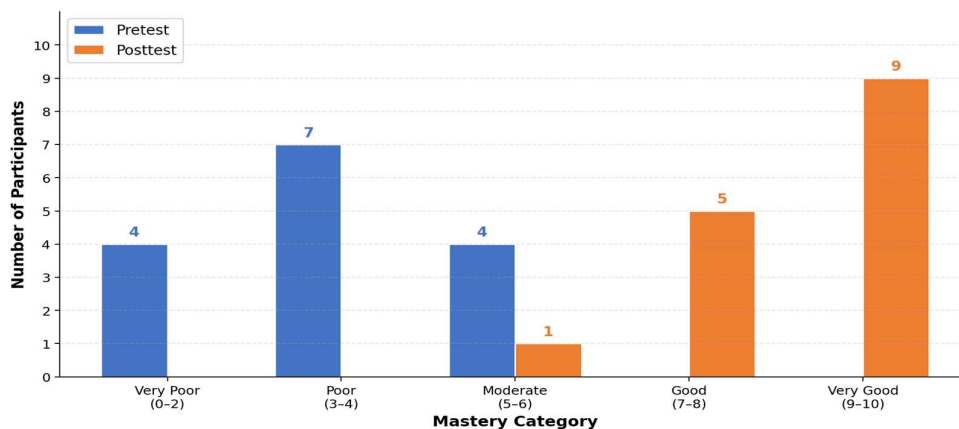


Figure 3. Distribution of Participants by Vocabulary Mastery Category.

The results indicate a clear and substantial shift in participants' vocabulary mastery categories after the intervention. Before the learning activities, no participants achieved good or very good categories, and 73.3% (11 of 15) were classified as poor or very poor. After the implementation of bilingual comic-assisted learning, 93.3% of participants (14 of 15) achieved good or very good categories, while none remained in poor or very poor categories. Only one participant (participant 10) remained in the moderate category with a posttest

score of 6. The statistically significant improvement ($p < 0.001$) confirms that the observed changes were unlikely to be attributable to chance alone.

Individual score analysis reveals meaningful variation in the magnitude of gains. Participants with the lowest pretest scores (2 points, very poor category) demonstrated some of the highest absolute gains: three participants improved from 2 to 10 (gain = 8) and one improved from 2 to 8 (gain = 6). Participants with moderate initial scores (4–5) also showed considerable gains, generally reaching 8–10 in the posttest. The participant with the lowest posttest score (participant 10, score = 6) had a pretest score of 2, suggesting that individual prior vocabulary exposure and reading readiness may have differentially influenced the rate of improvement.

4. Discussion

The pretest findings indicate that participants initially experienced difficulties in identifying and translating Gorontalo vocabulary correctly. Most participants were only able to answer two to four vocabulary items accurately, reflecting the limited exposure of children to Gorontalo language in daily communication and educational settings, consistent with broader patterns of regional language decline in Indonesian communities (Krashen, 2004; Fishman, 1991).

Following the intervention, posttest results revealed significant improvement in vocabulary mastery, confirmed by the Wilcoxon signed-rank test ($Z = -3.41$, $p < 0.001$). The improvement appears closely related to the visual and contextual characteristics of the comic. Illustrated narratives helped children associate vocabulary with concrete situations involving rivers, floating boats, waste, and environmental cleanliness. Visual narratives and contextual images can strengthen vocabulary retention because learners process verbal and visual information simultaneously through dual coding mechanisms (Paivio, 2006; Calisto-Miranda et al., 2018).

Several alternative explanations for the observed improvement should be considered to maintain analytical rigor. First, novelty effects may have contributed to heightened motivation during the intervention, as participants had not previously encountered comic-based regional language learning. Second, repeated testing effects cannot be entirely ruled out, as familiarity with the test format may have contributed to higher posttest scores. Third, group interaction during learning activities, including peer discussion and collaborative vocabulary identification, may have provided additional vocabulary reinforcement beyond the comic itself. Future studies should employ control groups and delayed posttests to disentangle these possible confounding factors.

Another aspect observed during the learning activities was participants' increasing confidence when mentioning Gorontalo vocabulary orally. During the pretest session, several participants hesitated when attempting to answer

vocabulary questions and frequently relied on Indonesian expressions. However, after participating in comic-assisted learning activities, children appeared more willing to repeat and mention Gorontalo vocabulary during discussions and games. This behavioral observation suggests that the visual narrative environment helped reduce learners' affective barriers toward unfamiliar regional language expressions.

Individual analysis of learning differences provides additional insight. Participants with the lowest initial scores demonstrated the highest absolute gains, suggesting that children with minimal prior exposure benefited most from structured bilingual vocabulary exposure. However, participant 10 showed a more modest improvement (from 2 to 6), which may reflect individual differences in reading readiness, attention during activities, or prior familiarity with coastal environments. This variability underscores the importance of considering individual learner factors in future intervention designs.

The bilingual structure of the comic appeared to function as a linguistic bridge, helping participants transition gradually from Indonesian toward Gorontalo vocabulary comprehension. This process supports Cummins' (2001) interdependence hypothesis, which suggests that proficiency in a heritage language can be developed through strategic use of the first language as a scaffold. Rather than positioning Gorontalo as entirely separate from children's dominant language practices, the bilingual presentation enabled participants to compare meanings directly within narrative situations.

The environmental context embedded in the comic narrative also played an important role in supporting learning engagement. Contextual learning environments connected to children's social realities help learners construct meaning more effectively because knowledge is associated directly with everyday experiences (Vygotsky, 1978). In this study, the coastal setting made the vocabulary more relatable because participants were already familiar with rivers, boats, and environmental issues in their surroundings.

From the perspective of language revitalization, it is important to distinguish clearly between the short-term vocabulary acquisition demonstrated in this study and the long-term goal of language revitalization. This study documents measurable vocabulary gains over two learning sessions; it does not claim to have achieved revitalization, which requires sustained community-wide language use across generations (Fishman, 1991). The findings should therefore be interpreted as preliminary evidence that bilingual comic-assisted learning can serve as one component of a broader revitalization strategy, rather than as a standalone revitalization solution.

The study also has methodological limitations that should be acknowledged. The small sample size ($n = 15$) limits the generalizability of findings to broader populations. The one-group pretest-posttest design without a control group restricts causal interpretation. The two-session intervention duration is short and

may not reflect outcomes achievable through sustained engagement. These limitations notwithstanding, the study provides valuable preliminary evidence for the potential of bilingual comic-assisted learning in community-based regional language education.

5. Conclusion

This study examined the effectiveness of bilingual comic-assisted learning with coastal environmental contexts in improving Gorontalo vocabulary acquisition among children. Participants demonstrated substantial and statistically significant improvement after engaging in learning activities using the comic *Perahu dan Rahasia Air*. The mean score increased from 3.40 to 8.87, and the Wilcoxon signed-rank test confirmed the significance of this improvement ($Z = -3.41$, $p < 0.001$). The proportion of participants achieving good or very good mastery categories increased from 0% to 93.3%, with only one participant remaining in the moderate category.

The visual narrative structure, bilingual presentation, glossary reinforcement, and contextual environmental themes collectively contributed to participants' vocabulary improvement. These findings highlight the importance of contextual and culturally relevant learning media in supporting regional language engagement among young learners. Bilingual comics rooted in children's environmental experiences can function not only as literacy media but also as meaningful components of broader regional language revitalization strategies.

This study was limited by the small participant sample, short intervention duration, and absence of a control group. Future studies are recommended to involve larger and more diverse participant groups, longer implementation periods, control group comparisons, and delayed posttest measurements to examine vocabulary retention. Longitudinal designs would further contribute to understanding the long-term effectiveness of bilingual comic-assisted learning in regional language revitalization programs.

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