

Developing Teaching Vocabulary for Students Based on Angkola Mandailing Culture

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ABSTRACT

This study aimed to develop English vocabulary teaching materials based on Angkola Mandailing culture for sixth-grade students at SD Negeri 102 Panyabungan, Indonesia, and to evaluate their feasibility and effectiveness. The study employed a Research and Development (R&D) method using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) with modifications from Sugiyono's procedures. The subjects were 20 sixth-grade students. Data were collected through needs analysis questionnaires, expert validation sheets, and pre- and post-test assessments. The developed materials integrated local cultural elements, including traditional clothing, houses, food, and historical figures. The expert validation results showed that the materials were highly feasible, with material experts scoring 86.25% and design experts 90%. The field testing results indicated a significant improvement in students' vocabulary mastery, with the mean pre-test score increasing from 58.55 to 83.40 in the post-test, representing a 42.44% improvement in the post-test. A paired t-test revealed a calculated t-value of 12.87, exceeding the t-table value of 2.093, leading to the rejection of the null hypothesis. The findings confirm that local culture-based vocabulary materials are effective, contextually relevant, and capable of enhancing students' learning motivation and vocabulary retention.

Keywords: Vocabulary Teaching Materials, Angkola Mandailing Culture, ADDIE Model

I. INTRODUCTION

Indonesia has many different cultures. The culture consists of language, traditional dance, food, drinks, and much more. Language is one of the most important aspects of culture. Language and culture are interlaced and complement each other; language is the vehicle through which "a culture conveys its beliefs, values, and norms" (Mubtadi'in, 2025). Santi et al. (2025) also noted that culture is one of the most important elements in language learning. Language and culture cannot be separated. Students must acquire language and culture. This means that when students learn a language, they automatically learn its culture. It is part of communicative competence, which includes cultural understanding, conversation, norms, and societal values of society (Santi et al., 2025).

Integrating local culture into the process of learning a foreign language has only recently begun to attract attention. Bassaw et al. (2025) stated that local culture is as influential as target culture awareness, as familiarity with local content serves as a motivator and identity builder for students to "construct their meanings and reflect their own culture as well as the culture of the target language (Bassaw et al., 2025). Huszka et al. (2025) stated that both students and teachers bring their own culture into the language classroom, and it is therefore important that both are aware of the interaction between cultures (Huszka et al., 2025).

Vocabulary is a fundamental component of learning a foreign language, especially English as a Foreign Language (EFL). It serves as the foundation for developing the four language skills: listening, speaking, reading, and writing. According to Nation (2013), vocabulary knowledge plays a crucial role in language proficiency because learners cannot communicate effectively without a sufficient vocabulary. Similarly, Tabullo et al. (2023) state that vocabulary acquisition is central to language learning and should be prioritized in teaching practices (Tabullo et al., 2023).

In the context of elementary education, teaching vocabulary requires appropriate materials relevant to students' cognitive development and sociocultural backgrounds. Young learners tend to learn better when the learning materials are concrete, contextual, and closely related to their daily lives (Noviyanti et al., 2025). Therefore, teaching materials should not only focus on linguistic aspects but also incorporate meaningful contexts that students can easily comprehend.

Ideally, English vocabulary teaching materials should be contextualized and culturally relevant to the target audience. The integration of local culture into teaching materials is highly recommended as it helps learners connect new knowledge with their existing cultural understanding. According to Musfidah et al. (2025), effective teaching materials should be meaningful, engaging, and culturally appropriate (Musfidah et al., 2025). Furthermore, local culture-based learning supports students' identities and promotes meaningful learning experiences (Sutiani et al., 2025).

However, in many elementary schools, including SD Negeri 102 Panyabungan, English vocabulary teaching is still dominated by conventional methods and generalized textbooks that lack cultural relevance. The materials used are often not related to students' local culture, particularly Angkola Mandailing culture, which is rich in values, traditions, and vocabulary that can support language learning. As a result, students tend to have low motivation and difficulty understanding and retaining vocabulary because the learning context feels unfamiliar and abstract.

This gap between the expected condition (contextual and culture-based learning) and reality (decontextualized and generic materials) indicates the need to develop appropriate teaching materials. Integrating Angkola Mandailing culture into vocabulary teaching materials is expected to make learning more meaningful, engaging, and effective for students. It can also help preserve local culture while improving students' English proficiency levels.

II. METHODS

This study employed a Research and Development (R&D) design. According to Sugiyono (2019), R&D is a research method used to produce specific products and test their effectiveness. The development procedure followed the ADDIE model, which consists of five phases: Analysis, Design, Development, Implementation, and Evaluation (Susilowati et al., 2025). This model was selected because it provides a systematic, flexible, and iterative framework suitable for developing educational materials (Sugiyono, 2019).

The research was conducted at SD Negeri 102 Panyabungan, located in Sigalayang, Sigalayang Julu, Panyabungan Kota District, Mandailing Natal Regency, North Sumatra, Indonesia. The school was chosen purposively based on preliminary observations indicating a lack of culturally relevant vocabulary materials and low student motivation to learn English. The research was conducted in the second semester of the 2025/2026 academic year. The study subjects were 20 sixth-grade students from class VI-A, comprising 10 male and 10 female students. This class was selected because the students had sufficient English exposure to participate in the material development and testing process.

The research procedure consisted of several stages, as follows. In the Analysis stage, the researcher conducted a needs analysis to identify problems and potential solutions. This involved distributing questionnaires to students, interviewing the English teacher, and observing the classroom activities. The needs analysis questionnaire assessed students' profiles, learning goals, necessities, wants, lacks, and preferred topics. The questionnaire items were developed based on the theories of Graves (2000), Nunan (2004), and Hutchinson and Waters (1987). The teacher interviews provided additional qualitative data regarding existing teaching practices and challenges. Classroom observations confirmed the lack of contextual and culture-based material. In the Design stage, based on the findings from the needs analysis, the researcher designed the vocabulary teaching materials. The materials were organized into four thematic units: traditional clothing, traditional houses, traditional foods, and historical figures of Angkola Mandailing culture. Each unit included vocabulary lists with pictures, bilingual explanations (English and Bahasa Indonesia), pronunciation guides, and various exercises, such as matching words with pictures, fill-in-the-blanks, multiple-choice questions, and translation tasks. The materials were designed to be colorful, engaging, and student-friendly.

In the Development stage, the designed materials were developed into a complete printed module. The module was then validated by two experts: a materials expert and a design expert. The validation instruments were based on the coursebook evaluation criteria from the National Education Standards Agency (BSNP, 2011), covering content, language, presentation, and graphical aspects. Experts used closed-ended questionnaires with a Likert scale (1-4) and open-ended questions to provide comments and suggestions. The validation results were analyzed using percentage scores, and revisions were made based on the expert feedback.

In the Implementation stage, the revised product was implemented with 20 sixth-grade students. The implementation used a one-group pre-test and post-test design. Before the treatment, the students took a pre-test to measure their initial vocabulary mastery. The pre-test consisted of 20 multiple-choice questions and 10 translation items covering vocabulary related to the four cultural themes. After the pre-test, the students received instruction using the developed Angkola Mandailing culture-based vocabulary materials over four sessions, each lasting 70 minutes. Following the treatment, students took a post-test with the same format and difficulty level as the pre-test.

In the Evaluation stage, the effectiveness of the developed materials was evaluated by comparing the pre- and post-test scores. The data analysis techniques included descriptive and inferential statistics. Questionnaire data from the needs analysis were analyzed by calculating the percentage of each response using the formula $P = (F/N) \times 100\%$, where P is the percentage, F is the frequency, and N is the total number of respondents. Scores were interpreted using Riduwan's (2016) criteria: 0-20% (very low), 21-40% (low), 41-60% (sufficient), 61-80% (high), and 81-100% (very high).

The pre- and post-test scores were analyzed by calculating the mean using the formula: $\text{Mean} (\bar{X}) = \Sigma X / N$, where ΣX is the sum of all scores and N is the number of students. The improvement percentage was calculated using the formula $P = [(X_2 - X_1) / X_1] \times 100\%$, where X_2 is the mean post-test score and X_1 is the mean pre-test score. To determine whether the improvement was statistically significant, a paired t-test was conducted using the formula: $t = (Md) / (\sqrt{(\Sigma d^2 - (\Sigma d)^2 / N) / N(N-1)})$, where Md is the mean difference between paired scores, Σd^2 is the sum of squared differences, and N is the number of students. The calculated t-value was compared with the t-table value at a significance level of $\alpha = 0.05$ with degrees of freedom (df) = N-1.

III. RESULTS AND DISCUSSION

A. Analysis

The needs analysis questionnaire was distributed to 20 students. The results revealed important information about students' profiles, goals, necessities, wants, lacks, and preferred topics of study.

Table 1. Students' Profile

No	Description	Frequency	Percentage
1	Male Students	10	50%
2	Female Students	10	50%
Total		20	100%

The teacher interviews and classroom observations indicated that vocabulary learning before the development relied on conventional methods. Students memorize word lists from textbooks without contextual meaning. The teacher identified several problems: students quickly forgot new words, were less motivated, the learning materials lacked local cultural relevance, students had difficulty pronouncing words, and there were limited interesting pictures or media.

Table 2. Goals of Learning English

No	Statement	Frequency	Percentage
1	Students want to master English vocabulary	18	90%
2	Students want to speak simple English	17	85%
3	Students want better English scores	19	95%

The data indicate that most students recognized the importance of vocabulary mastery and had a positive motivation to learn English for academic achievement and communication purposes.

Table 3. Necessities

No	Statement	Frequency	Percentage
1	Need vocabulary with pictures	19	95%
2	Need translation in Bahasa Indonesia	18	90%

No	Statement	Frequency	Percentage
3	Need examples from daily life	17	85%
4	Need pronunciation guide	16	80%

Students clearly needed visual, simple, and contextual materials.

Table 4. Wants

No	Statement	Frequency	Percentage
1	Want colourful book design	19	95%
2	Want games and exercises	18	90%
3	Want local culture topics	16	80%
4	Want group activities	15	75%

Students preferred enjoyable, interactive, and culturally connected materials.

Table 5. Lacks

No	Difficulty	Frequency	Percentage
1	Difficult to memorize words	15	75%
2	Difficult pronunciation	14	70%
3	Lack confidence	13	65%
4	Difficult spelling	12	60%

Most students experienced vocabulary retention problems, difficulty memorizing and pronouncing words, and low confidence.

Table 6. Preferred Topics

No	Topic	Frequency	Percentage
1	Traditional Food	19	95%
2	Traditional Clothes	17	85%
3	Traditional House	16	80%
4	Historical Figures	15	75%

Traditional food was the most preferred topic, and students showed a high interest in cultural themes. Based on these findings, the developed materials included four units: Traditional Clothes (shirt, hat, cloth, and scarf), Traditional House (roof, door, wall, and window), Traditional Food (rice cake, fish, chili, and coconut), and Historical Figures (king, leader, brave, and hero). The exercises included matching words and pictures, fill-in-the-blanks, multiple-choice, pronunciation practice, and translation tasks.

B. Expert Validation Results

The developed materials were validated by a material expert and a design expert based on the BSNP (2011) criteria.

Table 7. Material Expert Validation

No	Aspect	Score	Maximum	Percentage
1	Content suitability	17	20	85%
2	Language accuracy	16	20	80%
3	Presentation	18	20	90%
4	Relevance to curriculum	18	20	90%
Total		69	80	86.25%

The material expert's overall score of 86.25% fell into the "very feasible" category.

Table 8. Design Expert Validation

No	Aspect	Score	Maximum	Percentage
1	Layout	18	20	90%
2	Typography	17	20	85%
3	Illustration	19	20	95%
4	Color harmony	18	20	90%
Total		72	80	90%

The design expert's overall score of 90% also fell into the "very feasible" category. Revisions based on expert suggestions included adding pronunciation guides, improving font size, adding more colorful pictures, and simplifying instructions.

C. Field Testing Results

The product was tested with 20 students using a one-group pre-test and posttest design.

Table 9. Pre-Test Scores

Student	Score	Student	Score
1	60	11	63
2	55	12	58
3	58	13	55
4	62	14	62

Student	Score	Student	Score
5	64	15	59
6	57	16	57
7	59	17	60
8	61	18	61
9	56	19	58
10	60	20	56

Mean Pre-Test Score = 58.55

Table 10. Pre-Test Score Distribution

Category	Score Range	Number of Students
Good	76-85	0
Fair	56-65	20
Poor	36-55	0

Table 11. Post-Test Scores

Student	Score	Student	Score
1	82	11	87
2	80	12	83
3	84	13	81
4	85	14	85
5	86	15	82
6	81	16	80
7	83	17	84
8	84	18	85
9	80	19	83
10	82	20	81

Mean Post-Test Score = 83.40

Table 12. Post-Test Score Distribution

Category	Score Range	Number of Students
Excellent	96-100	0
Very Good	86-95	4
Good	76-85	16
Fair	56-65	0

Table 13. Improvement Percentage

	Mean Score	Improvement	Percentage
Pre-Test	58.55		
Post-Test	83.40	24.85	42.44%

Table 14. T-Test Result

Calculated t-value	12.87
t-table (df=19, $\alpha=0.05$)	2.093
Decision	Ha accepted, H0 rejected

The calculated t-value (12.87) exceeded the t-table value (2.093), indicating a statistically significant difference between the pre- and post-test scores.

D. Discussion

The findings of this study provide several important insights into the development and effectiveness of culture-based vocabulary teaching materials for elementary school students. First, the needs analysis confirmed that existing vocabulary teaching materials at SD Negeri 102 Panyabungan were largely decontextualized and culturally irrelevant. Students expressed difficulties in memorizing words, understanding their meanings, and maintaining motivation. These findings align with Mariya and Kanwal (2025), who reported that existing teaching materials in various Indonesian schools lack local cultural integration. The absence of local content creates psychological and cognitive distance between learners and the learning material, which is particularly problematic for young learners who thrive on concrete and familiar contexts (Mariya & Kanwal, 2025).

The development process systematically followed the ADDIE model, which proved to be an effective framework for creating culturally responsive teaching materials. Each stage—analysis, design, development, implementation, and evaluation—was built logically upon the previous one. The needs analysis stage was particularly crucial because it ensured that the materials were tailored to the specific characteristics, preferences, and cultural backgrounds of the target students. This learner-centered approach is consistent with the principles advocated by Hariyanti et al. (2025). Unlike conventional top-down material selection, this development process places student needs at the center of all decisions (Hariyanti et al., 2025).

The expert validation results demonstrated that the developed materials met high-quality standards. Material experts rated the content suitability at 85%, language accuracy at 80%, presentation at 90%, and curriculum relevance at 90%, resulting in an overall feasibility score of 86.25. Design experts rated the layout at 90%, typography at 85%, illustration at 95%, and color harmony at 90%, resulting in an overall score of 90%. Both scores fell within the “very feasible” category according to Riduwan’s (2016) criteria. These high validation

scores indicate that the materials are culturally appropriate and pedagogically sound. The integration of Angkola Mandailing cultural elements was implemented without sacrificing linguistic accuracy or instructional quality. This finding supports Tomlinson's (1998) assertion that good teaching materials must impact learners emotionally and cognitively (Dewa Made Alit, 2025).

The field-testing results revealed a substantial improvement in students' vocabulary mastery. The mean pre-test score of 58.55 increased to 83.40 in the post-test, representing an improvement of 42.44%. Furthermore, the t-test analysis showed a calculated t-value of 12.87, which significantly exceeded the critical t-table value of 2.093 at $\alpha=0.05$ with 19 degrees of freedom. This statistical result confirms that the improvement was not due to chance but rather the genuine effect of the intervention. Therefore, the alternative hypothesis (H_a) was accepted, and the null hypothesis (H_0) was rejected. These findings are consistent with those of Hafid et al. (2025), who reported that local culture-based materials significantly improve language learning outcomes (Hafid et al., 2025).

Several factors likely contributed to the observed efficacy. First, the use of familiar cultural content reduces Students' cognitive load. When learners encounter vocabulary embedded in contexts they already understand such as traditional foods they eat or traditional clothes they see at ceremonies they can focus their cognitive resources on learning new English words rather than struggling to understand the context itself. This aligns with Krashen's (1982) Affective Filter Hypothesis, which posits that anxiety and unfamiliarity raise the affective filter, hindering language acquisition. Conversely, comfort and familiarity lower the filter, facilitating the acquisition.

Second, the visual and interactive design of the materials—colorful pictures, matching exercises, fill-in-the-blanks, and pronunciation guides—catered to young learners' learning preferences. Silalahi (2022) emphasized that young learners benefit from concrete, visual, and kinesthetic activities. The materials developed in this study incorporate these elements extensively. The inclusion of pronunciation guides addressed one of the specific difficulties identified in the needs analysis, where 70% of the students reported difficulty with pronunciation (Silalahi, 2022).

Third, the thematic organization of the materials around culturally significant topics provided a coherent and meaningful structure for vocabulary acquisition. Rather than presenting isolated word lists, the materials grouped the vocabulary into logical categories (traditional clothes, house, food, and historical figures). This organizational strategy supports the creation of semantic networks in learners' mental lexicons, which facilitates both the storage and retrieval of vocabulary items (Anggraeni et al., 2024).

The positive results of this study have broader implications for EFL education in culturally diverse countries, such as -Indonesia. The success of Angkola Mandailing culture-based materials suggests that similar approaches could be applied to other local cultures across the archipelago in Indonesia. This would not only improve English learning outcomes but also serve the important goal of preserving culture. In an era of globalization, where local traditions are increasingly marginalized, integrating local culture into formal education can help young learners develop pride in their heritage while simultaneously acquiring global competencies.

Nevertheless, this study has several limitations. The sample size was limited to 20 students from a single school, which restricts the generalizability of the findings. The implementation period was relatively short, and long-term retention was not assessed. The materials were developed in a printed format only, without digital or multimedia components. Future research should address these limitations by conducting larger-scale studies, measuring long-term retention, and exploring the digital adaptation of culture-based materials. Future studies should investigate the effectiveness of similar materials for other language skills, such as speaking, reading, and writing.

IV. CONCLUSIONS

This study successfully developed English vocabulary teaching materials based on Angkola Mandailing culture for sixth-grade students at SD Negeri 102 Panyabungan using the ADDIE model. The existing materials used at the school were found to be decontextualized, lacking cultural relevance, and ineffective in supporting vocabulary mastery. The developed materials integrated local cultural elements—traditional clothes, houses, foods, and historical figures—into a visually engaging and learner-centered module. Expert validation confirmed that the materials were highly feasible, with material and design experts scoring 86.25% and 90%, respectively. Field testing with 20 students demonstrated a significant improvement in vocabulary mastery, with mean scores rising from 58.55 in the pre-test to 83.40 in the post-test, a 42.44% increase. A paired t-test yielded a calculated t-value of 12.87, exceeding the t-table value of 2.093, thus confirming that the improvement was statistically significant. Therefore, the alternative hypothesis was accepted and the null hypothesis was rejected. The findings support the integration of local culture into EFL teaching materials to

make learning more meaningful, engaging, and effective for young learners. Future research should explore the application of similar approaches in different cultural contexts and with larger samples.

Funding Statement

"No external funding was received for this study."

Ethical Compliance

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Data Access Statement

A Data Access Statement is a section in a scientific publication or research report that explains how the data used or generated in the study can be accessed by readers or other researchers. This statement aims to promote transparency, support research reproducibility, and comply with open-access policies, where applicable.

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Purpose of a Data Access Statement:

- Reproducibility: Enables other researchers to replicate or verify the findings.
- Collaboration: Encourages further collaboration by sharing data.
- Compliance: Adheres to the policies of funding agencies or journals that require open access to data.

Conflict of Interest Declaration

The authors declare that they have no affiliations or involvement with any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

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