



Enrekang Sociocultural Interactive Multimedia for Strengthening Cultural Literacy in Elementary School

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Abstract: Digital exposure provides elementary students with broad cultural access, but it can also widen the distance between globally circulating culture and students' understanding of their own local heritage. This study developed Enrekang sociocultural-based interactive multimedia for Natural and Social Sciences (IPAS) and examined its feasibility, practicality, and preliminary association with students' cultural literacy. A Research and Development design using the ADDIE model was implemented with one media expert, one subject-matter expert, one classroom practitioner, a nine-student small-group trial, and 35 fifth-grade students in the field implementation. The multimedia was developed with Articulate Storyline 3 and incorporated local cultural content, audio-video resources, interactive navigation, games, and automatically scored evaluation items. The overall expert-validation mean was 4.20/5, while practicality scores were 4.06 in the small-group trial and 4.51 in the field trial. Reanalysis of item-level responses showed that cultural literacy increased from $M = 53.29$ ($SD = 8.90$) to $M = 68.66$ ($SD = 7.14$). Difference scores were normally distributed (Shapiro-Wilk $W = .976$, $p = .619$), and the paired-samples test indicated a significant within-group increase, $t(34) = 10.289$, $p < .001$, 95% CI [12.34, 18.41], $d_z = 1.74$. The multimedia is feasible and practical and is associated with higher cultural-literacy scores; however, the one-group design does not permit strong causal inference.

Keywords: *cultural literacy; interactive multimedia; local culture; Articulate Storyline; elementary education*

Introduction

The rapid expansion of digital media has transformed how elementary-school students encounter information and culture. Digital environments can broaden students' perspectives, but they can also intensify exposure to popular global culture while local traditions remain weakly represented in formal learning resources. In Indonesia, this tension is pedagogically important because cultural diversity is not only a social reality but also a resource for identity formation, social participation, and contextual learning. Wulandari et al. (2023) reported limited interest among elementary students in Indonesian culture, while Iskandar et al. (2024) emphasized that cultural literacy in primary

education is needed to help children understand cultural diversity and develop appropriate ways of engaging with it.

Cultural literacy should therefore be understood as more than the recall of cultural names, artifacts, or ceremonies. It involves knowing one's own culture, recognizing similarities and differences across cultures, interacting respectfully with cultural diversity, valuing cultural heritage, understanding local social norms, and applying cultural values in everyday life. This broader conception is consistent with work that positions local wisdom as a meaningful source for cultural-literacy development in elementary education (Desyandri, 2018). In this sense, local culture becomes pedagogical content through which students can interpret social practices and

construct a more grounded understanding of identity and diversity.

The initial needs analysis at SDN 1 Enrekang identified a specific contextual problem. Fifth-grade students showed limited familiarity with local Enrekang culture when classroom learning was connected to their immediate social environment. Examples included Maccera Manurung and Dangke, a distinctive local food. At the same time, the IPAS materials available at school mainly presented Indonesian cultural diversity in broad national terms and did not sufficiently represent Enrekang-specific sociocultural content. Similar curricular problems have been reported elsewhere: locally grounded IPAS materials can make learning more relevant because they connect disciplinary content with students' lived environments (Duratun et al., 2024; Savera et al., 2025).

Interactive multimedia offers a practical route for addressing this representational gap. Multimedia can combine text, images, sound, video, animation, navigation, games, and feedback in a single environment, allowing students to engage with content rather than receive it only through teacher explanation. Prior studies have shown positive educational potential for interactive multimedia in elementary learning (Kahfi et al., 2021). Articulate Storyline is particularly suitable for this purpose because it supports interactive navigation, multimedia integration, branching, and automated feedback without requiring advanced programming. Previous development studies have used Articulate Storyline for elementary civic learning (Pratama & Batubara, 2021) and for mathematical literacy (Suryani et al., 2024).

Research has also begun to combine digital learning media with local wisdom. Siswoyo et al. (2023), for example, developed an interactive educational game integrated with Madurese local culture for elementary students' cultural literacy. However, the novelty of the present study is not the use of Articulate Storyline itself. Rather, it lies in the contextual integration of Enrekang sociocultural content, IPAS learning, six dimensions of cultural literacy, and an interactive multimedia environment designed for fifth-grade students

in the cultural setting being represented. This local alignment is important because technological sophistication alone does not guarantee meaningful learning; the pedagogical value depends on whether the content and interaction design connect with students' social and cultural experience.

Accordingly, this study aimed to (1) develop Enrekang sociocultural-based interactive multimedia for fifth-grade IPAS learning, (2) examine its feasibility through expert and practitioner evaluation, (3) examine its practicality through student responses, and (4) evaluate changes in students' cultural-literacy scores after using the multimedia. Because the effectiveness evaluation used a one-group pretest-posttest design, the study treats the observed change as preliminary within-group evidence rather than definitive causal proof.

Method

This study employed a Research and Development (R&D) design using the ADDIE framework: analysis, design, development, implementation, and evaluation. ADDIE was selected because it provides a systematic instructional-development sequence in which needs analysis, product design, implementation, and evaluation inform one another (Adeoye et al., 2024). The study was conducted at SDN 1 Enrekang, South Sulawesi, Indonesia, in 2026. The development and validation process involved one media expert, one subject-matter expert, and one fifth-grade classroom practitioner. The small-group trial involved nine fifth-grade students, and the field implementation involved 35 fifth-grade students.

During the analysis phase, classroom observation and teacher interviews were used to identify learning problems, student needs, and the availability of culturally contextualized IPAS materials. The design phase specified learning objectives, selected Enrekang sociocultural content, and produced a storyboard, navigation flow, and data-collection instruments. During development, the multimedia was produced with Articulate Storyline 3. The final product combined text, visual material, audio, instructional video,

interactive navigation, three main content selections, two game levels, and ten evaluation questions with automatic feedback. The product was published in HTML5 format so that it could be accessed through laptops and mobile devices without requiring a separate application installation.

Product quality was evaluated using five-point Likert questionnaires for the media expert, subject-matter expert, classroom practitioner, and student practicality responses. Expert feedback was used for revision before field use. Revisions included shortening overly dense cultural content, improving visual elements, adding a home button, repairing a non-functioning game button, and completing creator-profile information. The small-group trial was used to identify early usability issues before the 35-student field implementation.

Cultural literacy was measured using a 20-item four-point Likert questionnaire. The instrument represented six indicators: (1) knowledge of one's own culture, including customs, food, and language; (2) knowledge of cultural diversity and similarities/differences across cultures; (3) tolerance and positive interaction with different cultures; (4) orientation toward preserving cultural heritage; (5) understanding local rules and social ethics; and (6) application of local cultural values in everyday life. To strengthen measurement reporting, internal consistency was estimated from the available item-level data. Cronbach's alpha was .835 at pretest and .851 at posttest, indicating acceptable-to-good internal consistency for the study sample.

Descriptive analysis was used for expert validation, practicality, and indicator-level cultural-literacy scores. For the pretest-posttest comparison, total cultural-literacy scores were calculated from the 20 items. Because the same students were measured twice, normality was

examined for the paired difference scores using the Shapiro-Wilk test. A two-sided paired-samples t test was then used with $\alpha = .05$. The analysis also reported the 95% confidence interval for the mean difference and Cohen's d_z , calculated as the mean paired difference divided by the standard deviation of the difference scores. This analytic approach corrects the methodological inconsistency in the thesis draft, which described one normality procedure in the method section but reported a different procedure in the results. Research permission was obtained from the relevant local authority and the school before data collection.

Results and Discussion

Product development and refinement

The needs analysis confirmed that the central problem was not an absence of cultural content in the national curriculum, but a lack of locally specific representation. Students encountered cultural diversity largely through general examples, while Enrekang culture was weakly represented in the materials available to the class. The product was therefore designed to make local culture a core learning context rather than an ornamental addition to a generic lesson.

The developed multimedia organized learning through a start page, instructions, learning objectives, material selection, interactive content, games, and evaluation. The final interface combined culturally themed visuals with narrative text, interactive buttons, audio-video elements, and two game levels. Figure 1 presents representative screens from the developed product. The design illustrates the central pedagogical strategy: familiar local references were represented in the same digital format that students commonly encounter in contemporary learning environments



Figure 1. Representative screens of the Enrekang sociocultural interactive multimedia: (a) opening page, (b) cultural-content page, and (c) interactive game menu.

Feasibility and practicality

The expert and practitioner evaluations indicated that the product was suitable for field use after revision. Importantly, the article uses the consistent overall validation mean of 4.20 rather than the 4.08 value that appeared in one

part of the thesis conclusion. The 4.20 value is the mean reported in the expert-recapitulation table and is consistent with the media, material, and practitioner scores shown in Table 1.

Table 1. Expert validation and student practicality results

Assessment source	n	Mean score	Interpretation
Media expert	1	4.04/5	Feasible
Subject-matter expert	1	4.41/5	Very feasible
Classroom practitioner	1	4.16/5	Good
Overall expert/practitioner mean	3	4.20/5	Feasible
Small-group student trial	9	4.06/5	Good
Field student trial	35	4.51/5	Very good

The increase in student practicality ratings from 4.06 in the small-group trial to 4.51 in the field trial should not be interpreted as a statistical improvement between equivalent groups because the samples and stages served different purposes. Rather, the pattern suggests that product revision was followed by strong user acceptance in the larger implementation. The field ratings were particularly high for material presentation and attention, both 4.54, followed by motivation (4.51) and attractiveness (4.49).

These findings are consistent with earlier Articulate Storyline studies showing that interactive structure, multimodal presentation, and navigation can support positive user responses (Pratama & Batubara, 2021; Suryani et al., 2024). However, practicality should

remain conceptually distinct from learning effectiveness. A product can be attractive and easy to use without necessarily improving the intended competence. For that reason, the cultural-literacy outcome was analyzed separately.

Change in cultural literacy

All six cultural-literacy indicators increased descriptively after the multimedia was used. The largest percentage-point increase occurred in knowledge of cultural diversity (21.43 points), followed by understanding local rules and ethics (20.95 points) and tolerance/interaction across cultures (20.71 points). Table 2 summarizes the indicator-level pattern.

Table 2. Cultural-literacy scores by indicator

Cultural-literacy indicator	Pretest (%)	Posttest (%)	Change (pp)
Knowledge of own culture	64.29	80.95	16.67
Knowledge of cultural	65.95	87.38	21.43

diversity			
Tolerance and intercultural interaction	68.04	88.75	20.71
Cultural-heritage preservation	66.96	84.64	17.68
Understanding local rules and ethics	65.00	85.95	20.95
Application of local cultural values	68.81	86.67	17.86
Overall percentage	66.61	85.82	19.21

At the student level, the mean total score increased from 53.29 (SD = 8.90) to 68.66 (SD = 7.14), corresponding to 66.61% and 85.82% of the maximum possible score. The mean paired increase was 15.37 points (SD of differences = 8.84). The Shapiro-Wilk test for the difference scores was non-significant, $W = .976$, $p = .619$, supporting the normality

assumption for the paired t test. The paired-samples analysis showed a statistically significant within-group increase, $t(34) = 10.289$, $p < .001$, with a 95% confidence interval for the mean increase from 12.34 to 18.41 points. Cohen's $d_z = 1.74$ indicated a large standardized within-group change.

Table 3. Pretest-posttest analysis of total cultural-literacy scores

Statistic	Pretest	Posttest / paired result
Mean (SD)	53.29 (8.90)	68.66 (7.14)
Percentage of maximum	66.61%	85.82%
Mean paired difference	—	15.37 (SDdiff = 8.84)
Shapiro-Wilk on difference	—	$W = .976$, $p = .619$
Paired-samples t test	—	$t(34) = 10.289$, $p < .001$
95% CI of mean difference	—	[12.34, 18.41]
Effect size	—	Cohen's $d_z = 1.74$

Interpretation and contribution

The indicator-level pattern suggests that the multimedia did more than increase recognition of local cultural facts. Posttest scores were also higher for tolerance, social ethics, and application of local cultural values. This is important because cultural literacy should not be reduced to factual recall. The broader educational objective is to enable students to recognize cultural identity while engaging respectfully with differences. The pattern is consistent with the view that local wisdom can function as a learning resource for cultural literacy rather than merely as supplementary content (Desyandri, 2018; Iskandar et al., 2024).

The contextual design also aligns with recent IPAS development research. Duratun et al. (2024) showed that locally grounded IPAS materials can be developed as valid and effective learning resources, while Savera et al. (2025) demonstrated strong student responses

to local-wisdom digital comics in IPAS. The present study extends this line of work by embedding Enrekang culture into a more interactive environment that includes navigation, multimedia, games, and automatic feedback. Compared with the Madurese cultural-literacy multimedia reported by Siswoyo et al. (2023), the present product contributes a different local setting and explicitly organizes the outcome around six cultural-literacy indicators.

The contribution should nevertheless be framed carefully. The large within-group effect size does not establish that the multimedia alone caused the observed improvement. Without a control group, alternative explanations cannot be ruled out, including repeated measurement, teacher support during implementation, short-term familiarity with the questionnaire, and other classroom experiences occurring during the intervention. The correct inference is that cultural-literacy scores

increased substantially after the multimedia was used, not that the product has already been proven superior to conventional instruction.

Several limitations are therefore relevant for publication-level interpretation. First, the effectiveness phase involved only one class of 35 students from one school, which constrains external validity. Second, each validation domain was represented by one expert or practitioner; future studies should use a larger panel and report a formal content-validity index. Third, the cultural-literacy outcome was based on a self-report Likert instrument. Although internal consistency was adequate, future research should triangulate questionnaire responses with knowledge tests, performance tasks, observation, or authentic cultural-learning activities. Fourth, the absence of a comparison group limits causal inference. A multisite quasi-experimental design would provide stronger evidence regarding comparative effectiveness and transferability across cultural settings.

Despite these limitations, the study has a practical implication for elementary education. Digitalization and local cultural preservation need not be treated as competing agendas. A digital learning environment can be used to represent local cultural knowledge in forms that are accessible to contemporary students, provided that the technology remains subordinate to pedagogical goals and culturally meaningful content. In this study, the strongest innovation is therefore contextual rather than technological: Enrekang culture is transformed from a peripheral example into an organizing resource for IPAS learning and cultural-literacy development.

Conclusion

The study developed an Enrekang sociocultural-based interactive multimedia product for fifth-grade IPAS learning using the ADDIE model. The product integrated local cultural content with text, visual elements, audio-video resources, interactive navigation, two game levels, and automatic evaluation feedback. The overall validation mean was 4.20/5, and the field practicality score was 4.51/5, indicating that the product was feasible and highly acceptable to students.

Cultural-literacy scores increased from $M = 53.29$ to $M = 68.66$, with significant paired change, $t(34) = 10.289$, $p < .001$, and a large within-group effect size ($d_z = 1.74$). Improvements were observed across all six cultural-literacy indicators. These findings support the use of locally contextualized interactive multimedia as a promising instructional resource for connecting IPAS learning with students' cultural environment. However, the one-group design, single-school sample, limited expert panel, and self-report outcome measure require cautious interpretation. Future research should use controlled or quasi-experimental designs, multisite samples, broader expert validation, and multiple forms of cultural-literacy assessment.

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