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Contextualizing Social Studies with Mandar Culture Boosts Primary Learners' Interest and Achievement

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ABSTRACT

Persistent disengagement in primary Social Studies frequently occurs when instruction is weakly connected to pupils' lived cultural experiences. This study examined the effect of a culturally contextualized pedagogy grounded in Mandar culture on fifth-grade students' interest and achievement in Social Studies. A quasi-experimental pretest-posttest control group design was implemented in two public primary schools over eight weeks. Data were collected using a Likert-type interest scale, curriculum-aligned achievement tests, classroom observations, and implementation fidelity checklists. Descriptive statistics, assumption tests, independent-samples t tests, and multivariate analysis of variance with alpha set at 0.05 were employed. Compared with the control class, the experimental class showed substantially greater gains in both interest and achievement, and posttest differences between groups were statistically significant. These findings indicate that systematically embedding Mandar cultural elements such as Kalindaqdaq and Sayyang Pattu'du within inquiry-based and collaborative learning meaningfully strengthens student engagement and learning outcomes. The study concludes that integrating local culture into primary Social Studies is an effective strategy for improving both affective and cognitive learning indicators and offers a transferable model for culturally responsive curriculum design.

1. Introduction

Contextual learning effectively bridges classroom activities with authentic situations, enhancing the meaningfulness of knowledge, promoting transfer, and elevating motivation across disciplines (Hwang et al., 2014; Rohana et al., 2025; Suryawati & Osman, 2018). Contemporary cognitive science underscores that contextual inference shapes both memory formation and decision making, with knowledge acquired in context rich environments demonstrating higher retention

and applicability (Heald et al., 2023; Umemoto et al., 2017). Neurobiological studies further substantiate this connection, revealing that the processes of contextual memory encoding and consolidation engage hippocampal networks and neuromodulatory systems that are highly responsive to situational cues (Davis et al., 2018; Mitsushima et al., 2011).

In the field of education, the design of context based tasks, the utilization of local resources, and the promotion of inquiry driven activities are all associated with positive impacts on students' scientific attitudes and learning outcomes (Pishtari et al., 2022; Suryawati & Osman, 2018). Editorial commentaries across applied domains similarly identify contextual learning as a vital paradigm for enhancing educational performance (Contextual learning is nearly all you need, 2022). The ongoing digital transformation has further expanded the possibilities for contextual ecosystems through the adoption of educational games, virtual reality, and chatbots that foster meaningful interaction, including quiz based platforms that situate problem solving in playful yet curriculum aligned settings (Chien et al., 2022; Hwang & Chang, 2023; Paristiowati et al., 2019; Sani et al., 2025; Setyowati et al., 2023).

In the context of primary Social Studies, the urgency for contextual approaches is particularly pronounced, as curriculum content often remains disconnected from students' real life experiences, especially in culturally diverse settings such as Indonesia. Incorporating local culture into instructional practice is known to strengthen learners' identity, increase engagement, and enrich cultural literacy and character development (Kharisma et al., 2022; Parmiti et al., 2021; Rahim & Thaba, 2021). Curricula that respond to regional diversity serve to both preserve youth identity and facilitate spaces for intercultural dialogue (Jeon et al., 2024; Ratri et al., 2025). Moreover, embedding local values in subjects such as Economics and Social Studies has been linked to the reinforcement of community values, the promotion of sustainability, and the improvement of academic achievement (Rahmattullah et al., 2021; Samo & Kartasasmita, 2018). In Sulawesi, for example, the "Malaqbiq Tau Mandar" tradition illustrates how local wisdom can be mobilized to foster character education among students (Ramadhana et al., 2023). Beyond cognitive and affective benefits, culture based pedagogical strategies also promote intercultural communication and enhance learners' confidence (Fuadi et al., 2024; Suprijono, 2018).

Despite these potentials, many primary Social Studies classrooms continue to struggle with persistent challenges such as low engagement, fluctuating motivation, and inconsistent mastery of concepts, particularly when instructional delivery is decontextualized from pupils' lived environments (Laely et al., 2020; Winarso & Haqq, 2020). The acceleration of educational technology adoption during and after the pandemic has not always coincided with the integration of cultural and environmental contexts into daily classroom practice (Nabila & Widjajanti, 2020; Paristiowati et al., 2019; Xiao, 2024). In addition, varying levels of teacher preparedness and design support often result in contextual approaches being implemented only partially or treated as supplemental enrichment rather than as core instructional design (Renaldi et al., 2022; Setyowati et al., 2023).

Consequently, the personal relevance of Social Studies content is diminished, and opportunities to connect academic concepts with social practices in students' communities are frequently missed (Shidiq & Nasrudin, 2021; Winarso & Haqq, 2020).

The literature emphasizes the need for a systematic connection between Social Studies concepts and local cultural, social, and economic experiences, employing an orchestrated approach that integrates inquiry, collaboration, and reflection (Afni, 2020; Asrizal et al., 2018; Suryawati & Osman, 2018). Pedagogical models ranging from flipped game based learning to clinical and community simulations consistently demonstrate that situationally relevant tasks lead to improved performance and decision making (Chang et al., 2020; Davis et al., 2018; Hwang & Chang, 2023; Sani et al., 2025). Neuroscientific and memory science perspectives affirm that contextual experiences activate synaptic plasticity and consolidation mechanisms that are fundamental for long term retention (Meng et al., 2021; Mitsushima et al., 2011; Natale et al., 2020). Therefore, contextualizing Social Studies through local culture is not merely a pedagogical preference but is firmly grounded in well established cognitive mechanisms (Heald et al., 2023).

Current research has advanced the development of learning tools and media grounded in ethnomathematics, multiple representations, and design based strategies that connect curricular content with students' everyday experiences (Bakri & Mulyati, 2018; Budi Utami & Aulia, 2019; Suwito et al., 2020). The integration of immersive technologies and intelligent platforms, such as virtual reality, chatbots, and context based educational games, enriches learning environments with real life scenarios (Almeida et al., 2015; Chien et al., 2022; Hwang et al., 2014; Setyowati et al., 2023).

From a design perspective, analytics in mobile learning facilitate the systematic classification of cognitive and contextual elements, supporting the alignment of instructional objectives, activities, and assessments (Pishtari et al., 2022). In parallel, recent work in elementary classrooms has demonstrated the feasibility of contextual learning media such as Lubaku, Mimi Grass, and Pamitung to connect abstract mathematics and science concepts with concrete artefacts and playful, hands on experiences (Damayanti & Prihatna Wati, 2025; Lestari & Prihatna Wati, 2025; Putri & Wati, 2025). These approaches have consistently been shown to increase student participation, curiosity, and conceptual understanding when learning contexts are rich and relevant to learners' lived situations (Hwang et al., 2014; Hwang & Chang, 2023; Paristiowati et al., 2019; Rohana et al., 2025).

Efforts to integrate local culture are also progressing at the policy, institutional, and classroom levels. Institutionalizing local values through governance mechanisms promotes the sustainability of culture based education (Gusti Agung Mas Rwa Jayantiari et al., 2024; Handayani, 2023). Literacy programs that embed local cultural discourse have demonstrated positive effects on reading skills and scientific attitudes (Kharisma et al., 2022; Palennari et al., 2023; Parmiti et al., 2021). At the classroom level, resources such as illustrated dictionaries reflecting local culture and science projects based on traditional practices foster both environmental

awareness and cultural literacy (Parmiti et al., 2021; Rahim & Thaba, 2021). In particular, leveraging Mandar culture for character development provides a robust foundation for integrating cultural context into Social Studies in Indonesia (Ramadhana et al., 2023).

Despite these advances, several critical gaps remain. First, there is a lack of rigorous experimental or quasi experimental evidence evaluating the effectiveness of Mandar culture based contextualization in Social Studies, particularly concerning its impact on primary students' interest and achievement with systematic fidelity monitoring (Begeny et al., 2023; Ramadhana et al., 2023; Renzetti et al., 2021). Second, while many technology supported contextual interventions appear promising, they have not been subjected to robust experimental methodologies in primary, non metropolitan settings (Chikeme et al., 2024; Pieper et al., 2024; Watson et al., 2023). Third, there is a notable scarcity of studies assessing both affective (interest) and cognitive (achievement) outcomes concurrently and detailing the strategies used to ensure implementation fidelity (Barghazan et al., 2023; Begeny et al., 2023). Fourth, teacher readiness and the availability of design support continue to vary, highlighting the necessity for practical and standardized professional development tools (Renaldi et al., 2022; Shidiq & Nasrudin, 2021).

To address these gaps, the present study develops and tests a Mandar culture contextualization model that integrates narratives, artefacts, social practices, and authentic problem solving into inquiry, collaboration, and reflection activities. The hypotheses are supported by evidence indicating that cultural context enhances personal relevance and stimulates cognitive processes conducive to retention and transfer (Samo & Kartasasmita, 2018; Suprijono, 2018; Suryawati & Osman, 2018). The scope of this study includes primary Social Studies within a Mandar cultural environment, employing a structured intervention, contextual lesson plans, local culture media, and mechanisms for monitoring implementation fidelity (Palennari et al., 2023; Rahim & Thaba, 2021).

The evaluation framework combines measures of learning interest and conceptual achievement to capture the simultaneous affective and cognitive impacts (Davis et al., 2018). Accordingly, the objectives of this research are: (1) to evaluate the effect of Mandar culture contextualization on students' learning interest, (2) to assess its influence on Social Studies achievement, and (3) to analyze the relationship between changes in interest and achievement within the designed contextual activities. These research aims are grounded in best practices of contextual learning design (Hwang et al., 2014; Pishtari et al., 2022; Suryawati & Osman, 2018) and in the educational and cultural significance of Mandar culture integration in Indonesian primary education (Kharisma et al., 2022; Ramadhana et al., 2023), while building on JES-based evidence of contextual and game supported learning in elementary classrooms (Damayanti & Prihatna Wati, 2025; Lestari & Prihatna Wati, 2025; Putri & Wati, 2025; Rohana et al., 2025; Sani et al., 2025).

2. Methodology

Design

A quantitative, quasi-experimental pretest–posttest control group design was adopted to examine the impact of Mandar-culture-oriented contextual teaching on the interest and achievement of Grade 5 students in Social Studies. This methodological approach was selected to facilitate causal inference within authentic field conditions, especially where strict individual randomization is not feasible, while maintaining internal validity through procedural controls and assumption testing (Barghazan et al., 2023; Renzetti et al., 2021; Thomas & Liu-Thompkins, 2024).

Setting and Participants

The study population included 201 Grade 5 pupils distributed across nine public primary schools within the Gugus Sipatokko cluster, Pamboang Subdistrict, Majene Regency. Schools were randomly selected at the institutional level, resulting in SDN No. 24 Luaor as the experimental site and SDN No. 28 Inpres Luaor as the control site, with 26 students per class. The intervention was conducted over two months, in alignment with the schools' regular academic calendar, ensuring data were collected under standard classroom conditions.

Intervention

The experimental class engaged in Contextual Teaching and Learning (CTL) that was explicitly integrated with Mandar cultural artefacts, in particular Kalindaqdaq poetry and the Sayyang Pattu'du tradition, in order to establish clear links between Social Studies content, students' daily experiences, and local values. CTL-based interventions in prior studies have been shown to increase student activeness, interest, and academic performance across diverse subject areas and educational levels (Afni, 2020; Asrizal et al., 2018; Davis et al., 2018; Mungawanah et al., 2018; Paristiowati et al., 2019, 2023; Roopa & Hunashyal, 2020; Rohana et al., 2025; Sugiati & Harahap, 2021).

In parallel, culture-based learning has been associated with enhanced meaningfulness of learning experiences and more positive affective outcomes, particularly when local narratives, practices, and artefacts are systematically embedded in instruction (Djiwandono, 2023; Hadiananto et al., 2022; Kleden et al., 2018; Parmiti et al., 2021; Rahim & Thaba, 2021; Ramadhana et al., 2023; Samo & Kartasasmita, 2018; Suprijono, 2018). Studies conducted in Indonesian primary schools further demonstrate that contextual media such as Lubaku, Mimi Grass, and Pamitung can concretize abstract mathematical and scientific ideas and support active participation (Damayanti & Prihatna Wati, 2025; Lestari & Prihatna Wati, 2025; Putri & Wati, 2025), providing an important design precedent for the culture-rich materials used in this intervention. In this study, lesson plans in the experimental class were structured so that key Social Studies topics were introduced, explored, and reflected upon through Mandar cultural media, guided

inquiry, and collaborative activities. The control class, by contrast, received conventional Social Studies instruction that did not explicitly incorporate local cultural content or CTL sequences.

Fidelity Supports

To ensure fidelity of the intervention, two principal steps were undertaken: (a) the experimental teacher participated in brief training sessions and received structured feedback prior to implementation; and (b) periodic classroom observations were conducted using a standardized implementation checklist, followed by reflective coaching conversations (Begeny et al., 2023).

Measures

The primary instrument used to measure affective outcomes was a learning-interest questionnaire employing a 1–4 Likert scale, which was designed to assess attention to content, curiosity, active engagement during lessons, and consistency in participation. Supplementary qualitative data on student behavior and engagement were gathered through process observation sheets and documentation of student activities. Instrument development followed established context-based performance assessment practices that emphasize clarity of indicators, reliability of scoring, contextual relevance of items, and expert content validation (Sugiati & Harahap, 2021; Susilaningsih et al., 2018). Selection of indicators was informed by prior evidence that contextual pedagogies incorporating authentic media and activities, such as instructional videos, project-based tasks, game-based quizzes, and out-of-class assignments, are positively associated with increased affective engagement and participation (Paristiowati et al., 2023; Rachmadina & Pratiwi, 2021; Renaldi et al., 2022; Sani et al., 2025; Sekarini & Arty, 2019). Cognitive outcomes were assessed through achievement tests aligned with the national Social Studies curriculum, ensuring consistency with mandated learning objectives and content coverage.

Procedures

Prior to the intervention, Social Studies syllabi were synchronized between the two groups. Both classes completed a learning-interest pretest. During the intervention phase, the experimental group participated in discussions, inquiry-based tasks, and projects linking Kalindaqdaq and Sayyang Pattu'du traditions to core Social Studies topics (for example, analyzing social values in Kalindaqdaq poetry and relating these to themes of cultural diversity). The control group received conventional instruction without the integration of local cultural content. After the instructional period, both groups completed a posttest, and additional observational documentation was collected.

Data Analysis

Descriptive statistics included the calculation of mean, median, mode, minimum and maximum values, and the categorization of score distributions. Prior to

hypothesis testing, the data were examined for normality using the Shapiro–Wilk test, homogeneity of variance with Levene’s test, and, where appropriate, homogeneity of covariance matrices with Box’s M test. Differences between groups in posttest results were assessed using independent-samples t-tests, with effect sizes reported using Cohen’s d. Simultaneous effects of the intervention on both interest and achievement were analyzed using MANOVA at $\alpha = .05$ (Q. Li & Zhou, 2021; Renzetti et al., 2021; Thomas & Liu-Thompkins, 2024).

Validity and Reliability

Content validity was established through expert review by two Social Studies educators, with a focus on comprehensive indicator coverage and cultural appropriateness for the Mandar context. Internal reliability was estimated through pilot testing and verified prior to the main data collection. Data credibility was strengthened through triangulation across questionnaires, observations, and documentation, as well as by systematic monitoring of implementation fidelity (Asrizal et al., 2018; Begeny et al., 2023; Paristiowati et al., 2019; Sekarini & Arty, 2019).

3. Results and Discussion

At the time of data collection, each participating class consisted of 26 Grade 5 students drawn from similar socioeducational backgrounds within the Gugus Sipatokko cluster. Both schools implemented the national Social Studies curriculum and used comparable textbooks, with instruction predominantly characterized by teacher centered explanation, limited use of visual media, and occasional question and answer sessions. Classroom observations and teacher reports indicated that, prior to the intervention, many students participated only when called upon, displayed fluctuating attention during lessons, and rarely initiated questions or extended discussion. Homework completion and follow up tasks were generally adequate but often procedural, with few opportunities for students to connect Social Studies concepts to their daily lives in the Mandar community.

The gender distribution in both classes was relatively balanced, and students represented a range of prior achievement levels, as reflected in school records and teacher evaluations. In routine lessons preceding the study, activities rarely incorporated local cultural artefacts or contexts explicitly, and local traditions such as Kalindaqdaq and Sayyang Pattu’d� were seldom used as instructional resources in Social Studies. This baseline pattern is consistent with reports that many primary classrooms in diverse settings continue to rely on decontextualized, textbook based approaches that do not fully exploit learners’ cultural resources (Laely et al., 2020; Winarso & Haqq, 2020). The pretest scores for learning interest and achievement in both the experimental and control classes reflected these conditions, with moderate levels of interest and achievement and substantial room for improvement, but without large initial differences between groups.

During the intervention phase, the experimental class received a Mandar culture contextualization model that integrated narratives, artefacts, and social practices into inquiry based and collaborative activities, whereas the control class continued to receive conventional instruction. In the experimental class, three main categories of local cultural media were used systematically, namely Kalindaqdaq lyric cards that were analyzed for their social values (Figure 1), visual sequences and photographs of the Sayyang Pattu'du tradition used to prompt discussion of cultural diversity and community celebrations (Figure 2), and locally produced maps and posters representing Mandar social and economic activities that served as anchors for small group projects (Figure 3). Lessons in the experimental group combined teacher guidance with student discussion, group work, and reflective tasks that explicitly linked these media to the Social Studies syllabus topics. In contrast, the control class followed the same curricular content sequence but relied primarily on textbook explanations, teacher exposition, and short written exercises, without explicit integration of Mandar cultural artefacts.

In response to the research questions, the empirical findings show that a contextual approach anchored in local culture consistently enhances students' learning interest and academic achievement in Social Studies compared with conventional instruction. This pattern is visible in the descriptive profiles from pretest to posttest, in the fulfillment of parametric statistical assumptions, and in both univariate (t test) and multivariate (MANOVA) inferential analyses. These results converge with prior evidence that contextual designs, including flipped learning, game based activities, digital media, and authentic experiential tasks, tend to reinforce cognitive and affective engagement, support sound decision making, and improve academic outcomes (Asrizal et al., 2018; Chang et al., 2020; Davis et al., 2018; Hwang & Chang, 2023).

A clear increase in learning interest was observed in the experimental class following implementation of the local culture contextual model. As presented in Table 1, the mean score increased from 62.00 at pretest to 86.00 at posttest, the median rose from 56 to 88, and the mode shifted from 60 to 88. The score range also moved upward with greater stability, as indicated by an increase in the minimum score from 47 to 75 and in the maximum score from 84 to 97. These changes reflect heightened and more consistent student engagement throughout the instructional period. By comparison, the control class, which received conventional teaching, also showed improvement but to a lesser extent. As summarized in Table 2, the mean increased from 58.00 to 76.00, the median from 53 to 72, and the mode from 56 to 73, while the minimum and maximum scores shifted from 50 to 59 and from 78 to 91, respectively. This pronounced difference between the two classes supports the proposition that meaningful contextualization through local cultural content strengthens intrinsic motivation and encourages deeper elaboration of knowledge than traditional content delivery. These findings are consistent with literature confirming the effectiveness of contextual and ethnopedagogical approaches in promoting curiosity, scientific literacy, and higher order thinking skills (Budi Utami & Aulia, 2019; Paristiowati et al., 2019; Sekarini & Arty, 2019).

Table 1. Descriptive Statistics of Learning Interest—Experimental Class

Descriptive Statistics	Before the Intervention	After the Intervention
Mean	62.00	86.00
Median	56	88
Mode	60	88
Minimum	47	75
Maximum	84	97

Table 2. Descriptive Statistics of Learning Interest—Control Class

Descriptive Statistics	Before the Intervention	After the Intervention
Mean	58.00	76.00
Median	53	72
Mode	56	73
Minimum	50	59
Maximum	78	91

Parametric assumptions were examined prior to hypothesis testing. As shown in Table 3 and Table 4, the Shapiro Wilk tests for learning interest (pretest and posttest) yielded p values greater than 0.05 ($p = 0.084$ and $p = 0.335$), indicating that the interest data were normally distributed. The learning achievement scores also passed normality checks, with p values of 0.123 and 0.069. Levene's tests further confirmed the homogeneity of variance for all comparisons, including posttest learning interest ($p = 0.141$), as indicated in Table 5. The satisfaction of these assumptions justifies the use of parametric procedures and reinforces the validity of the resulting inferences. This level of methodological rigor is consistent with research that combines classroom performance evaluation and authentic assessment within contextual learning frameworks (Roopa & Hunashyal, 2020; Sugianti & Harahap, 2021; Susilaningsih et al., 2018).

Table 3. Normality Test (Shapiro–Wilk)—Learning Interest

Variable	W	p
Pretest Learning Interest	0.929	.084
Posttest Learning Interest	0.975	.335

Table 4. Normality Test (Shapiro–Wilk)—Learning Achievement

Variable	W	p
Pretest Learning Achievement	0.965	.123
Posttest Learning Achievement	0.959	.069

Table 5. Homogeneity of Variance (Levene)

Variable	F	df1	df2	p
Pretest Learning Interest	3.765	1	50	.058
Posttest Learning Interest	2.237	1	50	.141

With respect to learning achievement, the control class also showed progress over the course of the study. As shown in Table 6, the mean score increased from 59.81 to 76.73, the median from 60 to 80, and the mode from 60 to 75, while the minimum and maximum scores rose from 50 to 60 and from 80 to 90, respectively. However,

the magnitude of improvement in the control class was lower than that observed in the experimental group, in line with expectations that rich contextualization should yield stronger gains. The literature indicates that contextual approaches employing multi representational resources, video based tools, and metacognition driven e modules enrich meaning making and the transfer of knowledge, thereby supporting higher academic achievement (Ahdhianto et al., 2021; Bakri & Mulyati, 2018; Mungawanah et al., 2018; Rachmadina & Pratiwi, 2021).

Table 6. Descriptive Statistics of Learning Achievement—Control Class

Descriptive Statistics	Before the Intervention	After the Intervention
Mean	59.81	76.73
Median	60	80
Mode	60	75
Minimum	50	60
Maximum	80	90

Inferential analyses further substantiated the superiority of the local culture contextual approach. As summarized in Table 7, independent samples t tests for posttest scores revealed significant mean differences between the experimental and control classes for both learning interest ($t = 4.635$; $p < .001$; Cohen's $d = 1.285$) and learning achievement ($t = 2.782$; $p < .001$; Cohen's $d = 0.772$). The large effect size for interest and the moderate to large effect for achievement underscore the substantial impact of the intervention on both affective engagement and academic outcomes. These results converge with a growing body of evidence that emphasizes contextual activation, whether situational, cultural, or environmental, as a powerful lever for decision making, critical analysis, and task performance in diverse instructional formats, including flipped and game based learning (Chang et al., 2020; Hwang & Chang, 2023; Paristiowati et al., 2023).

Table 7. Independent-Samples t-Tests

Part A. Test Statistics (Student & Welch)

Variable (Comparison)	Test	t	df	p
Pretest Learning Interest (Exp. vs Ctrl.)	Student	1.473	50.000	< .001
	Welch	1.473	46.114	< .001
Pretest Learning Achievement (Exp. vs Ctrl.)	Student	1.350	50.000	< .001
	Welch	1.350	47.769	< .001
Posttest Learning Interest (Exp. vs Ctrl.)	Student	4.635	50.000	< .001
	Welch	4.635	43.358	< .001
Posttest Learning Achievement (Exp. vs Ctrl.)	Student	2.782	50.000	< .001
	Welch	2.782	49.020	< .001

Part B. Mean Differences and Effect Sizes (Posttest)

Variable	Mean Difference	SE Difference	Cohen's d	SE d
Posttest Learning Interest	10.308	2.224	1.285	0.330
Posttest Learning Achievement	6.923	2.488	0.772	0.297

To assess the joint effect of the intervention on both dependent variables, a MANOVA using Pillai's Trace was conducted. As reported in Table 8, the analysis confirmed a significant multivariate difference between the experimental and control groups ($F \approx 5.413$; $p < .001$; Pillai's Trace = 0.315). This result indicates that the local culture contextual approach exerted a simultaneous influence on

learning interest and learning achievement, not merely independent effects on each outcome. These findings align with research demonstrating that instructional designs integrating contextual and cognitive elements tend to produce broad gains across multiple dimensions of learning (E. Li & Shi, 2019; Pishtari et al., 2022).

Table 8. MANOVA (Pillai's Trace)

Source	df	Approx. F	Pillai's Trace	Num df	Den df	p
Intercept	1	2116.940	0.994	4	47.000	< .001
Class	1	5.413	0.315	4	47.000	< .001
Residuals	50	—	—	—	—	—

Mechanistically, the observed pattern suggests that a local culture contextual approach functions as an attentional anchor, activates relevant schemata, and serves as a meaningful source for student engagement. Through authentic experiences, multiple representations, and collaborative social interactions, this approach enhances interest as an affective outcome while also strengthening conceptual understanding as a cognitive outcome, which in turn translates into higher academic performance. This dual pathway is supported by research in contextual inference, cognitive flexibility, and neurocognitive mechanisms of learning (Heald et al., 2023; Ji et al., 2020; Le Dantec & Seitz, 2020).

The consistency between descriptive and inferential indicators further underscores the robustness of the intervention. Increases in minimum and median posttest scores in the experimental group show that the benefits were distributed across a broad range of students, rather than being confined to those with already high baselines. Such patterns are often observed when educational activities are contextually and personally relevant to learners' lived experiences (Renaldi et al., 2022; Sekarini & Arty, 2019). In contrast, the more modest gains in the control group suggest that conventional instruction that lacks explicit contextual anchors may be insufficient to drive substantial improvements in either interest or achievement over a similar time frame.

From a methodological perspective, rigorous testing of normality and homogeneity assumptions enhances the interpretive reliability of both the *t* tests and the MANOVA. This is particularly important in educational field settings where instructional interventions may interact with background variables such as student readiness, access to resources, and cultural experience. Within contextual learning frameworks, these variables are intentionally incorporated through multiple representations, culture based tasks, and multimedia resources, an approach that is consistently supported by the literature (Bakri & Muliyati, 2018; Mahardika et al., 2020; Paristiowati et al., 2023; Sung et al., 2022). Overall, the statistical evidence in this study is coherent with established theoretical perspectives and practical recommendations for contextual learning design.

In summary, the empirical results provide strong evidence that a local culture oriented contextual approach leads to substantial improvements in learning interest and to moderate to large gains in learning achievement, as indicated by converging descriptive, univariate, and multivariate analyses. The magnitude and direction of

these effects are in line with cross domain literature that advocates integrating authentic context, multiple representations, and meaningful experience into instructional design to optimize both affective and cognitive learning outcomes (Afni, 2020; Ahdhianto et al., 2021; Heald et al., 2023; Ji et al., 2020; Le Dantec & Seitz, 2020; Mahardika et al., 2020; Pishtari et al., 2022; Rachmadina & Pratiwi, 2021; Roopa & Hunashyal, 2020; Sugiyati & Harahap, 2021; Sung et al., 2022).

Discussion

The findings of this study indicate that a local culture oriented contextual approach produces substantial improvements in elementary students' interest and achievement in Social Studies, thereby addressing the core research questions. The consistent gains observed in the experimental class across descriptive and inferential indicators support the theoretical proposition that connecting curricular content to students' lived experiences enhances psychological relevance, promotes deeper engagement, and enriches the construction of meaning. The integration of Mandar cultural elements, such as Kalindaqdaq and Sayyang Pattu'du, provides concrete evidence that contextualizing instruction within local wisdom can foster self efficacy, affective attachment, and problem solving skills, patterns that resonate with earlier studies on culture based education and governance in local cultural ecologies (Gusti Agung Mas Rwa Jayantiari et al., 2024; Handayani, 2023; Kharisma et al., 2022; Parmiti et al., 2021; Rahim & Thaba, 2021; Samo & Kartasasmita, 2018; Suprijono, 2018; Yan et al., 2022). JES-based research on contextual teaching and localized media further demonstrates that culture-rich designs can meaningfully improve language proficiency, mathematics performance, and conceptual understanding in primary classrooms (Damayanti & Prihatna Wati, 2025; Lestari & Prihatna Wati, 2025; Putri & Wati, 2025; Rohana et al., 2025; Sani et al., 2025), reinforcing the generalizability of the present findings.

From a pedagogical standpoint, the results suggest that the combination of structured CTL sequences with context based experiences and digital media broadens opportunities for cognitive elaboration and transfer. Empirical research has shown that contextual educational games, app based mathematics videos, and performance assessments anchored in authentic contexts contribute to improvements in performance, mathematical communication, and science process skills, which is consistent with the elevated interest and achievement documented in the experimental group (Afradisca, 2019; Chang et al., 2020; Hutapea et al., 2019; Rachmadina & Pratiwi, 2021; Susilaningsih et al., 2018).

Metacognition oriented e modules embedded within CTL frameworks have also been reported to facilitate self regulation and active participation, echoing the observed expansion in the lower and upper bounds of student scores in this study (Ahdhianto et al., 2021). Even in virtual and collaborative environments, contextual interaction has been shown to elevate group engagement, underlining the importance of contextual proximity in capturing and sustaining attention (Apostolellis & Bowman, 2014). These pedagogical advantages are corroborated by work linking CTL to increased personal meaning making and higher order thinking skills, and they closely mirror JES reports that contextual, artefact-based

media such as Lubaku, Mimi Grass, and Pamitung are able to transform routine tasks into rich, exploratory learning experiences (Biryukova, 2020; Damayanti & Prihatna Wati, 2025; Lestari & Prihatna Wati, 2025; Mungawanah et al., 2018; Obermeier & Elgort, 2021; Pal et al., 2021; Putri & Wati, 2025; Roopa & Hunashyal, 2020).

At the level of the underlying problem, persistent low interest in elementary Social Studies has frequently been attributed to conventional teaching practices that remain disconnected from students' sociocultural realities. When local culture is treated as peripheral, the identity based bridges that support relevance and persistence are weakened, leading to shallow learning interactions. Cross domain scholarship highlights the role of local culture as a symbolic and normative resource for mobilizing student engagement, a perspective that helps to explain the substantial increase in interest scores among pupils who received culturally contextualized instruction in this study (Handayani, 2023; Stihl, 2024; Yan et al., 2022).

In Indonesia in particular, research on local traditions and cultural literacy in primary education shows that culturally grounded resources, ranging from illustrated dictionaries and culture integrated science projects to artistic practices, can serve as cognitive anchors for internalizing abstract Social Studies concepts, in line with the patterns observed in the experimental class (Parmiti et al., 2021; Rahim & Thaba, 2021; Rahmat et al., 2024). JES findings on game based and contextual media interventions likewise indicate that when everyday artefacts and narratives become central to task design, students' willingness to engage and persist increases markedly (Damayanti & Prihatna Wati, 2025; Putri & Wati, 2025; Rohana et al., 2025; Sani et al., 2025).

The gap between curricular design and students' cultural identities also intersects with broader domains such as religious moderation and social cohesion, which have been shown to benefit from the infusion of local culture into values based curricula and literacy initiatives (Burga & Damopolii, 2022; Fuadi et al., 2024; Hindaryatiningsih et al., 2025; Ratri et al., 2025). In language and intercultural education, the incorporation of local culture has been found to support identity formation and sustain engagement with demanding material, a process mirrored in the positive trends reported for interest and achievement in this study (Ratri et al., 2025). Taken together, these strands of evidence suggest that the central challenge in primary schools is not simply the use of monotonous methods but an epistemic gap between students' cultural experience and the representations found in the curriculum. The locally oriented CTL model tested here can therefore be viewed as a structured attempt to close this gap, with the resulting gains in both interest and achievement providing empirical support for this interpretation.

The mechanisms through which the intervention appears to operate can be further illuminated by linking the present findings to cognitive and neurocognitive theory. First, CTL approaches grounded in local culture are likely to enhance problem solving and confidence by activating familiar schemas, which facilitate conceptual elaboration and strengthen memory traces (Samo & Kartasasmita, 2018; Suprijono,

2018). Second, science learning that integrates cultural artefacts, such as the use of traditional instruments in laboratory activities, has been shown to foster scientific attitudes and process skills, a pattern that parallels the consistent gains in both interest and achievement in this study (Parmiti et al., 2021; Rahmat et al., 2024). Third, the pairing of digital tools, including videos and e modules, with authentic cultural contexts can strengthen critical thinking, communication, and learning personalization, which corresponds to the sizable interest gains observed in the experimental class (Ahdhianto et al., 2021; Chang et al., 2020; Hutapea et al., 2019; Pal et al., 2021; Rachmadina & Pratiwi, 2021).

From a cognitive theoretical perspective, CTL designs that leverage cultural artefacts may promote cognitive flexibility and context driven transfer. Computational modeling of contextual learning suggests that variation in contextual cues enhances strategy adaptation and decision making, a pattern that is consistent with the concurrent improvements in interest and achievement reported here (Ji et al., 2020). Complementary work in second language idiom learning indicates that contextually rich conditions accelerate online processing and deepen comprehension (Obermeier & Elgort, 2021). Together with findings on contextual games in health education, these results support the claim that authentic, culture rich experiences increase both cognitive and affective engagement, which is aligned with the large effect size for interest and the moderate to large effect for achievement found in this study (Chang et al., 2020). The present data therefore not only confirm that the intervention “works” but also cohere with theoretical accounts that emphasize the role of context in shaping learning trajectories (Heald et al., 2023; Le Dantec & Seitz, 2020).

The inferential analyses conducted in this study further reinforce the effectiveness of the approach while also raising methodological considerations. Independent samples t tests revealed significant post intervention differences in both interest and achievement, and MANOVA indicated a significant joint effect on the two dependent variables. The validity of these outcomes is strengthened by the satisfaction of normality and homogeneity assumptions and by systematic monitoring of implementation fidelity. This is consistent with contemporary recommendations that quasi experimental designs in education employ rigorous assumption testing and multivariate models to support credible inferences (Begeny et al., 2023; Q. Li & Zhou, 2021; Renzetti et al., 2021; Van Hell et al., 2021; Watson et al., 2023). At the same time, the absence of individual randomization and the relatively small number of schools limit the generalizability of the findings, suggesting that more powerful designs, such as cluster randomized trials or micro randomized experiments, could be employed in future research to probe the stability of effects across time and context (Pieper et al., 2024; Thomas & Liu-Thompkins, 2024).

When compared with related interventions, the gains in student interest in the present study appear to be at the upper end of those typically reported for CTL and culture based approaches, particularly when culture functions as a unifying theme across activities. Project based studies that incorporate cultural elements have documented significant improvements in scientific attitudes and process skills,

although relatively few have used multivariate models to evaluate simultaneous outcomes as was done here (Rahmat et al., 2024). Contextual videos and e modules have similarly been shown to support sustained attention and metacognitive strategy use, which corresponds to the increases in mean and median interest observed in the experimental class (Ahdhianto et al., 2021; Rachmadina & Pratiwi, 2021). Evidence that CTL enhances mathematical communication and higher order thinking skills suggests that affective gains may be intertwined with expansion of cognitive capacity, in line with the achievement improvements documented alongside interest gains (Budi Utami & Aulia, 2019; Hutapea et al., 2019; Mungawanah et al., 2018; Roopa & Hunashyal, 2020).

Within the framework of interest theory, the substantial post intervention gains in the experimental group can be interpreted as reflecting increased coherence among personal values, cultural identity, and academic tasks. The integration of Kalindaqdaq and Sayyang Pattu'du appears to function as a narrative scaffold that aligns students' cultural schemata with targeted Social Studies competencies, thereby making learning tasks both meaningful and appropriately challenging. Indonesian studies on the inclusion of local culture in schools report similar outcomes, including enhanced cultural literacy, moral engagement, and identity formation, all of which contribute to sustained interest and persistence (Burga & Damopolii, 2022; Fuadi et al., 2024; Handayani, 2023; Hindaryatiningsih et al., 2025; Khalid, 2023; Ratri et al., 2025). In this light, the observed gains in student interest should not be viewed as transient enthusiasm but rather as evidence of a deeper alignment between instructional goals and students' intrinsic values and social experiences.

The role of implementation fidelity is also crucial in interpreting the findings. The substantial increases in interest and achievement indicate that the core components of the intervention, including authentic contextualization, meaningful activities, metacognitive scaffolding, and integration of local culture media, were consistently delivered. Literature on implementation fidelity emphasizes that coaching and structured support for teachers are essential conditions for realizing the full potential of pedagogical innovations, a point reflected in the stability and spread of scores in the experimental class (Begeny et al., 2023; Watson et al., 2023). Nonetheless, sustaining such fidelity at scale may require institutional support in the form of professional development, curriculum resources, and governance structures that normalize culture based CTL practices (Gusti Agung Mas Rwa Jayantiari et al., 2024; Handayani, 2023; Stihl, 2024; Yan et al., 2022).

Finally, the MANOVA results suggest that the locally oriented CTL intervention does not merely exert separate influences on interest and achievement but operates as an integrated system that shapes both constructs simultaneously. Work at the intersection of culture, governance, and educational ecologies indicates that local culture establishes rules, values, and practices that inform students' responses to academic challenges, which helps to explain why joint effects on affective and cognitive outcomes are plausible when culture is embedded as a central pedagogical principle (Gusti Agung Mas Rwa Jayantiari et al., 2024; Handayani, 2023; Stihl, 2024; Yan et al., 2022). In practical terms, media and activities can be conceived as

context amplifiers, with culture based projects, artefact exploration, and performative tasks designed to direct attention and anchor the meaning of abstract concepts. Evidence on the effectiveness of digital tools, performance based instruments, and contextual games affirms both the feasibility and impact of such designs (Chang et al., 2020; Pal et al., 2021; Susilaningsih et al., 2018). Collectively, the convergence of empirical findings, theoretical perspectives, and prior research provides a strong basis for recommending locally oriented CTL as a viable strategy for strengthening both interest and achievement in primary Social Studies.

4. Conclusion

This study concludes that a Mandar-culture-oriented contextual pedagogy is an effective strategy for enhancing both engagement and learning outcomes in primary Social Studies. Compared with conventional instruction, the intervention produced clear improvements in students' interest and meaningful gains in achievement, indicating that the approach successfully addressed the initial problems of low motivation and uneven conceptual mastery. By embedding local cultural narratives and artefacts within sequences of inquiry, collaboration, and guided reflection, the intervention aligned learners' values and prior experiences with curricular goals, thereby fostering sustained attention, richer meaning-making, and more robust transfer of knowledge.

The study contributes to the literature in three main ways. First, it offers school-based quasi-experimental evidence that a culture-rich contextual design can simultaneously strengthen affective and cognitive outcomes, which are rarely examined together in primary Social Studies. Second, it demonstrates how local culture can be systematically operationalized as a task context—through texts, practices, and concrete products—while maintaining curricular rigor and supporting quality of implementation through fidelity monitoring. Third, it proposes a reproducible assessment framework that integrates descriptive profiling, measures of practical significance, and multivariate analysis suited to classroom interventions.

These findings have important implications for curriculum and teacher development. Social Studies units should be contextualized around locally resonant themes, supported by multipresentational tasks that connect cultural artefacts to key concepts and by structured reflection to sustain interest. Future research should examine the durability and scalability of these effects across grades and subjects, and explore underlying mechanisms such as cultural identity, self-efficacy, and metacognition through longitudinal and mixed-methods designs.

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