

Integrating the Contextual Teaching and Learning Model with the Local Wisdom of *Guro-Guro Aron* to Enhance Students' Literacy Skills

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ABSTRACT:

It remains very difficult for students to develop literary skills after finishing high school, solely because of the backwardness of their learning related methods caused by being unconnected with cultural tradition and reality. This study aims to examine the efficacy of combining the Contextual Teaching and Learning (CTL) model with local wisdom Guro-Guro Aron in promoting students' literary skills. Design of quasi-experimental research with pre-test and post-test control groups. The subjects were 64 university students, who were divided into the experimental group (32) and the control group (32). Data were collected using a rigorous measure of reading and writing skills that underwent pilot tests for reliability and validity, then analysed using nonparametric statistics (Kruskal-Wallis test and Mood's median H test) and an independent-samples t-test. Results reveal that the experimental class performed better than its control counterparts ($t=4.87$, $q<0.001$). Their average score went up from 68.45 before the experiment to 82.73 afterwards, whereas in the control group it rose less dramatically, from 69.12 at pre-test to 73.21 afterwards. An N-gain score of 0.62 showed moderate to strong effectiveness of the integration. From these findings, we can say that blending CTL with the local tradition of Guro-Guro Aron significantly enhances students' literary skills. A richer understanding of individual contexts and local cultures should improve the way we approach literacy teaching in higher education..

Keywords: Contextual Learning, Literacy Skills, Local Wisdom

1. Introduction

Literacy skills play an essential role in higher education, as they enable students to access information, construct reasoning, engage in critical thought, and communicate effectively. In the 21st-century academic environment, literacy extends beyond basic reading and writing skills to encompass analytical interpretation, critical reflection, and contextual understanding (Bhowmik & Kim, 2021). Despite the acknowledgment of literacy's significance, there is well-documented evidence that university students face persistent

challenges in understanding academic texts, synthesizing information, and articulating coherent written arguments (Huang, 2021). These difficulties largely stem from traditional instructional methods focusing on rote content delivery rather than meaningful engagement with material, which creates barriers to effective learning and comprehension (Anyichie & Butler, 2023).

One pedagogical approach that addresses these challenges is the Contextual Teaching and Learning (CTL) model, which is grounded in constructivist theory. According to the CTL framework, learning

material should relate to students' real-life experiences, promoting inquiry, collaboration, and authentic assessment (Parhan et al., 2024). The seven components of CTL identified by Harrisah et al., include constructivism, inquiry, and authentic assessment, among others, which collectively aim to foster a deeper engagement with academic content and improve cognitive skills related to literacy (Harrisah et al., 2023). Studies suggest that CTL enhances critical thinking, creativity, communication, and collaboration skills, all integral to successful academic performance and literacy development (Akmal et al., 2023).

However, the implementation of CTL often encounters a critical gap regarding the integration of culturally relevant knowledge systems. Many existing studies reveal that while CTL promotes effective pedagogical practices, it frequently overlooks the cultural contexts that shape students' identities and learning preferences (Safirah et al., 2024). For instance, the principles of culturally responsive teaching can significantly amplify the effectiveness of CTL by linking academic content with students' own sociocultural experiences (Ciampa & Reisboard, 2020). Evidence points to the necessity for integrating local wisdom into CTL frameworks to create more meaningful learning environments that resonate with diverse student populations (Melo et al., 2025).

Local wisdom, such as Guro-Guro Aron, a traditional practice emphasizing communal cooperation and artistic expression, can serve as a valuable asset in creating authentic learning experiences that align with CTL principles (Khaled, 2024). The values inherent in Guro-Guro Aron, collaboration, respect, and responsibility, echo the cooperative and experiential nature of CTL (Calvit & Ford, 2023). By embedding such culturally meaningful practices into academic instruction, educators can enhance student engagement, promote a sense of belonging, and facilitate deeper comprehension, all of which support literacy development (Jaya & Nurqamarani, 2023). This culturally responsive approach not only affirms students' identities but also situates learning within familiar social structures, making it more relevant and accessible (Trinh et al., 2024).

Despite the promising benefits of integrating cultural traditions with CTL, current research remains limited regarding systematic approaches that combine pedagogical models with local cultural practices to bolster literacy skills specifically (Sörensen, 2023). This indicates a significant avenue for further empirical studies to explore the impacts of such integrations on literacy competencies among university students. Improving literacy skills among university students in the contemporary academic landscape necessitates a shift towards pedagogical practices that prioritize contextual learning and cultural relevance. The CTL model, complemented by local wisdom, offers a robust framework for enhancing literacy competencies through engagement that is both meaningful and culturally affirming. Future research should focus on developing methodologies that systematically integrate local cultural traditions within the CTL framework to provide insights into effectively supporting students' literacy development.

Therefore, this study aims to investigate the effectiveness of integrating the Contextual Teaching and Learning model with the local wisdom of *Guro-Guro Aron* to enhance students' literacy skills. Specifically, the research seeks to: (1) examine differences in literacy achievement between students taught using the integrated model and those taught using conventional methods; and (2) analyze the extent to which culturally contextualized learning contributes to literacy improvement. The findings are expected to contribute to the development of culturally responsive pedagogical strategies in higher education and to provide empirical evidence supporting the integration of local wisdom into instructional design.

2. Methodology

2.1 Research Design

The study utilized a quasi-experimental design, specifically a non-equivalent control group pretest–posttest design, where two intact classes were designated as the experimental and control groups without random assignment. Both groups were assessed with a pretest to gauge initial literacy skills prior to the intervention. The experimental group engaged in instruction combining the Contextual

Teaching and Learning (CTL) model with local wisdom of Guro-Guro Aron, while the control group received conventional lecture-based instruction. Post-intervention, both groups undertook a posttest to evaluate any changes in literacy performance. This methodology aligns well

with findings from studies employing similar quasi-experimental designs, which affirm its effectiveness in educational settings when random assignment is not feasible (Yalley et al., 2021). The research design can be illustrated as in Table 1.

Table 1: The research design

Group	Pretest	Treatment	Posttest
Experimental	O ₁	X (CTL + Guro-Guro Aron)	O ₂
Control	O ₁	– (Conventional Learning)	O ₂

2.2 Participants

The study involved 64 undergraduate students from an Arts and Culture course at a public university Medan, Indonesia, utilizing purposive sampling to select two existing classes. Each group comprised 32 students with similar academic backgrounds, confirmed by institutional placement data and pretest scores. This approach aligns with recognized practices in quasi-experimental research, which often employs purposive sampling to select participants, particularly when random assignment is not feasible (Ng’oma et al., 2024). Moreover, utilizing intact classes for matching academic backgrounds aids in mitigating bias, ensuring comparability between experimental and control groups, a method supported by various educational studies (Erkol et al., 2023).

Overall, the participant selection process was designed to create robust and comparable groups for evaluating the effects of the instructional methods employed in this study.

2.3 Research Instruments

This study used several research instruments to collect accurate and valid data. The instruments were adjusted to the research objectives and the quasi-experimental design. They were used to measure students’ improvement in literacy skills and to observe the learning process during the intervention. The main instrument was a Literacy Skills Test, supported by an Observation Sheet and Documentation. Validity testing was conducted to ensure the content was appropriate, and reliability analysis was performed to ensure consistency (see Table 2).

Table 2: Research Instruments and Their Specifications

Instrum ent	Type	Measure d Aspects	Valid ation	Reliab ility
Literacy Skills Test	Essay-based and analytical reading tasks	Reading comprehension, critical analysis, interpretation, argumentative writing	Validated by three educational experts	Cronbach’s Alpha = 0.87 (High reliability)

Observation Sheet	Structured observation checklist	Collaboration, critical questioning, contextual application, participation	Expert judgment validated	Inter-rater agreement ensured
Documentation	Instructional and learning	Lesson plans, student assignments,	Not applicable (support)	Used for triangulation

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2.4 Research Procedure

This study was conducted through a structured quasi-experimental procedure consisting of four main stages: preparation, pretest administration, treatment implementation, and posttest administration. The procedure was designed to ensure systematic implementation of the

instructional intervention and accurate measurement of students' literacy improvement. The experimental group received instruction through the integration of the Contextual Teaching and Learning (CTL) model with the values of *Guro-Guro Aron*, while the control group was taught using conventional lecture-based methods. The following stages describe the research implementation process as shown in Figure 1.

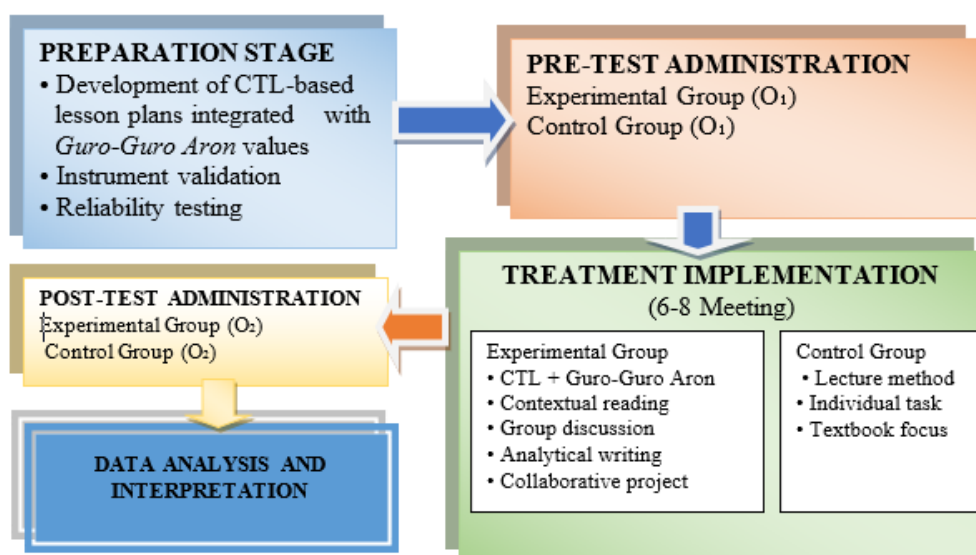


Figure 1: Quasi-Experimental Research Procedure

This visual structure clearly represents the pretest–treatment–posttest flow and highlights the instructional distinction between groups, which is essential in quasi-experimental

reporting. The intervention was conducted over 8 meetings (approximately 8 weeks). The timeline as shown in Table 3 details the instructional sequence in the experimental group.

Table 3: Timeline of Implementation

Meeting	Topic & Focus	CTL Component	Integration of Guro-Guro Aron Values	Learning Activities	Assessment
1	Introduction to Literacy & Cultural Context	Relating	Introduction to communal values	Discussion on local traditions and literacy importance	Participation observation
2	Reading Cultural Texts	Experiencing	Understanding cooperation values	Contextual reading of local cultural texts	Reading worksheet
3	Identifying Main Ideas & Arguments	Experiencing	Collective reflection	Group text analysis	Analytical questions

4	Critical Analysis of Cultural Issues	Applying	Dialogic interaction	Group discussion and critical questioning	Observation rubric
5	Interpretation of Cultural Meaning	Applying	Cultural identity awareness	Short essay writing	Writing task
6	Developing Argumentative Writing	Cooperating	Shared responsibility	Collaborative argumentative writing	Draft submission
7	Project-Based Cultural Analysis	Transferring	Collective learning practice	Group project presentation	Project rubric
8	Reflection & Evaluation	Transferring	Reflection and mutual respect	Reflection discussion	Posttest

Data Analysis

The data analysis for this study was conducted using quantitative statistical procedures with SPSS. Descriptive statistics were calculated, including means, standard deviations, minima, and maxima to summarize the participants' pretest and posttest scores. Assumption testing was performed through the Kolmogorov–Smirnov test for normality and Levene's Test for homogeneity, ensuring the suitability of the subsequent inferential statistical analyses. Within-group improvements were assessed using paired samples t-tests, while independent samples t-tests compared posttest scores between groups, with a significance level set at $\alpha = 0.05$. Additionally, N-gain analysis was utilized to measure the level of improvement in literacy skills, and Cohen's d was calculated to determine the effect size, providing

insight into the magnitude of the treatment effect. This comprehensive statistical framework effectively evaluated the impact of integrating the Contextual Teaching and Learning (CTL) model with local wisdom on students' literacy skills compared to conventional instructional methods (Bartlett et al., 2024).

3. Results

3.1 Descriptive Statistics

Descriptive statistics were calculated to examine the distribution of students' literacy scores before and after the treatment. This analysis provides an overview of the central tendency and variability of scores in both the experimental and control groups. The results include the mean, standard deviation, minimum score, and maximum score for the pretest and posttest as shown in Table 4.

Table 4: Descriptive Statistics of Pretest and Posttest Scores

Group	Test	N	Mean	SD	Min	Max
Experimental	Pretest	32	68.45	6.82	56	80
Experimental	Posttest	32	82.73	5.94	71	92
Control	Pretest	32	69.12	7.01	55	81
Control	Posttest	32	73.21	6.47	60	85

Table 4 shows that both groups had similar average pretest scores (68.45 for the experimental group and 69.12 for the control group). This

indicates that the students' initial literacy skills were relatively comparable before the treatment. After the intervention, the experimental group

showed a significant increase in the mean score from 68.45 to 82.73. In contrast, the control group showed a smaller improvement from 69.12 to 73.21. The standard deviation values slightly decreased in the experimental group, indicating that students' scores became more consistent after the treatment. Overall, the descriptive results suggest that the integration of the CTL model with *Guro-Guro Aron* values contributed to greater improvement in students' literacy skills compared to conventional instruction.

3.2 Assumption Testing

3.2.1 Normality Test

Before conducting inferential statistical analysis, a normality test was performed to determine whether the data were normally distributed. Normal distribution is an important assumption for parametric tests such as the t-test. In this study, the Kolmogorov-Smirnov test was used to examine the normality of pretest and posttest scores in both the experimental and control groups (see Table 5).

Table 5: Normality Test Results (Kolmogorov-Smirnov)

Group	Test	Sig. (p)	Interpretation
Experimental	Pretest	0.200	Normal
Experimental	Posttest	0.134	Normal
Control	Pretest	0.176	Normal
Control	Posttest	0.098	Normal

Table 5 shows that all significance (p) values are greater than 0.05. This means that the pretest and posttest data in both groups are normally distributed. Because the normality assumption is met, parametric statistical tests such as the paired samples t-test and independent samples t-test can be appropriately used for further analysis.

3.2.2 Homogeneity Test

Before conducting the independent samples t-test, a homogeneity of variance test was performed to determine whether the variances of the experimental and control groups were equal. Homogeneity of variance is an important assumption in parametric statistical analysis. In this study, Levene's Test was used to assess whether the distribution of pretest and posttest scores between the two groups had equal variances (see Table 6).

Table 6: Homogeneity of Variance Test

Variable	F	Sig. (p)	Interpretation
Pretest Scores	0.412	0.523	Homogeneous
Posttest Scores	0.587	0.447	Homogeneous

Table 6 shows that the significance (p) values for both pretest and posttest scores are greater than 0.05. This indicates that the variances of the experimental and control groups are equal. Since the homogeneity assumption is met, the independent samples t -test can be conducted to compare the posttest scores between the two groups.

Table 7: **Paired Samples t -Test Results (Within-Group Improvement)**

Group	Mean Difference	t	df	Sig. (p)	Interpretation
Experimental	14.28	12.64	31	< 0.001	Significant Improvement
Control	4.09	4.11	31	< 0.001	Significant Improvement

Table 7 shows that both groups experienced significant improvement because the significance (p) values are less than 0.05. However, the experimental group showed a much larger mean difference (14.28) compared to the control group (4.09). This indicates that students who learned through the integration of the CTL model with *Guro-Guro Aron* values improved their literacy skills more substantially than those who received conventional instruction. Overall, although both teaching methods contributed to improvement, the integrated CTL approach produced a stronger learning impact.

Table 8: **Independent Samples t -Test Results (Posttest Scores)**

Group	Mean	SD	t	df	Sig. (p)	N-Gain	Effect Size Cohen's d
Experimental	82.73	5.94	4.87	62	< 0.001	0.62	1.19
Control	73.21	6.47				0.18	

The analysis revealed a statistically significant difference between the two groups ($t = 4.87$, $p < 0.001$). Since the significance value is less than 0.05, the null hypothesis is rejected. This result indicates that the experimental group achieved a substantially higher improvement level compared to the control group. An effect size of 1.19 indicates a large effect, meaning the treatment

3.3 Within-Group Improvement

To determine whether there was a significant improvement in literacy skills within each group, a paired samples t -test was conducted. This test compares pretest and posttest scores from the same group to examine whether the treatment produced meaningful changes. The analysis was performed separately for the experimental and control groups as in Table 7.

3.4 Between-Group Comparison

To examine whether there was a significant difference in literacy achievement between the experimental and control groups after the intervention, an independent samples t -test was conducted on posttest scores. This analysis determines whether the integrated Contextual Teaching and Learning (CTL) model with *Guro-Guro Aron* values produced significantly better outcomes compared to conventional instruction (see Table 8).

had a strong practical impact on students' literacy skills.

The independent samples t -test confirms that students taught using the integrated CTL and *Guro-Guro Aron* approach achieved significantly higher posttest scores than those taught using conventional methods. The difference is not only statistically significant ($p < 0.001$) but also practically meaningful, as indicated by the large

effect size ($d = 1.19$). Furthermore, the N-gain analysis shows that the experimental group experienced moderate-to-high improvement (0.62), while the control group demonstrated only low improvement (0.18). This suggests that integrating culturally relevant local wisdom into contextual learning substantially enhances literacy development.

Overall, these findings provide strong empirical evidence that the integration of the CTL model with *Guro-Guro Aron* values has a significant and powerful impact on improving students' literacy skills in higher education. The results of the analysis between groups can be illustrated with a graphical bar chart as in Figure 2.

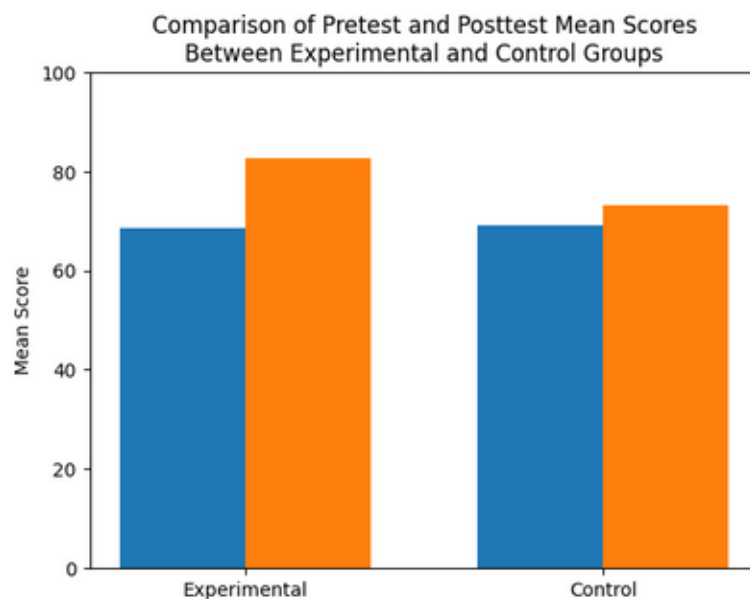


Figure 2: Comparison of Pretest and Posttest Mean Scores Between Experimental and Control Groups

The bar chart illustrates that both groups began with nearly similar pretest mean scores. However, the experimental group shows a substantially greater increase from pretest (68.45) to posttest (82.73) compared to the control group (69.12 to 73.21). This visual evidence supports the statistical findings that the integration of the CTL model with *Guro-Guro Aron* values resulted in a stronger improvement in students' literacy skills compared to conventional instruction.

4. Discussion

Recent research illustrates the effectiveness of integrating the Contextual Teaching and Learning (CTL) model with local wisdom, particularly in enhancing literacy skills among students. This study reveals significant improvements in literacy for students engaged in culturally contextualized education, as evidenced by robust statistical results using the independent samples t-test, where $t = 4.87$ and $p < 0.001$. The large effect size of Cohen's $d = 1.19$ and an N-gain score of

0.62 signify not only statistical significance but also an educational impact of moderate to high effectiveness (Patras et al., 2023).

The findings align with constructivist learning theory, which posits that learning is most effective when students can connect new knowledge to their existing sociocultural contexts. The CTL model, which emphasizes contextual and culturally relevant learning experiences, fundamentally supports this constructivist framework. Incorporating values from the local *Guro-Guro Aron*, such as cooperation and social dialogue, further enriches this process. Students engaged with academic texts within these culturally familiar frameworks were able to interpret, analyze, and reconstruct knowledge more effectively, enhancing their comprehension and critical reasoning skills (Lee & Huruta, 2022).

Furthermore, traditional instructional methods, such as lecture-based teaching, yielded only

modest improvements in the control group, despite statistical significance. The control group's N-gain of 0.18 signifies that while conventional methods have their merits in knowledge retention, they lack the immersive and collaborative qualities that foster deeper literacy skills (Futterman et al., 2024).

This study contributes to the growing body of literature advocating for the integration of culturally contextualized learning in higher education. By empirically demonstrating that structured educational strategies combining CTL with specific local traditions can lead to significant literacy gains, it sets a precedent for future research. Continued exploration into the mechanisms of culturally responsive educational practices could provide further insight into their broad applications across diverse educational contexts, reinforcing the importance of local wisdom in curriculum development (Poland-McClain et al., 2024).

5. Conclusion

This research set out to find out how successfully linking Contextual Teaching and Learning (CTL) with the native Guro-Guro Aron knowledge culture served readers-to-be: in higher education. Results show that the combination of instructional approaches significantly boosted students' literacy compared to conventional lecture-based methods. According to statistical

analysis there was a significant difference between experimental class and control groups (with $t = 4.87$, $p < 0.001$), with invitingly large effect size (Cohen's $d = 1.19$) together with moderate to high N-gain score (0.62). overall!

As these findings show, literacy is enhanced by being embedded in learners' social and cultural contexts. The Guro-Guro Aron values, including collectiveness, dialogue, reciprocity and reflective thought interwoven with wise laughter of course gave rise to the first truly innovative education mode. When literacy tasks were embedded in contexts of cultural relevance, students achieved better comprehension and deeper understanding. Their analytical thinking improved and students' rhetorical skills strengthened. While the control group demonstrated a certain degree of improvement, it was nowhere near as pronounced as the treatment group. Thus, producing some indication that traditional instruction is not itself enough to generate optimal levels of literacy. Therefore context-based, culturally responsive approaches may offer a valuable strategy for higher education in achieving better reading achievement levels.

On its theoretical side, this study enhances the notion that literacy is socially and culturally situated. In practice, however, this research gives you something tangible to work with: an innovative pedagogical model combining local wisdom and modern instructional frameworks.

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8. Author Declaration

The author declares that this manuscript is original, has not been published or submitted elsewhere, and all sources have been properly acknowledged. The author further confirms that the research was conducted ethically and declares no financial, professional, personal, or institutional conflicts of interest related to this study.