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The Impact of Contextual Teaching and Learning on Students' Cognitive Abilities in Material of My Region My Pride

Adelina Br Sembiring[1], Eka Yusnaldi[1]
[1]Universitas Islam Negeri Sumatera Utara Medan, North Sumatra, Indonesia

Corresponding author e-mail: adelina306213090@uinsu.ac.id

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Abstract: This study aims to investigate the impact of the Contextual Teaching and Learning (CTL) model on the cognitive abilities of fifth-grade students in learning the topic "My Region, My Pride" at MIS Maura El-Mumtaz, Binjai City. The research seeks to determine whether CTL, which connects learning material to real-life experiences, enhances students' understanding compared to conventional methods. A quasi-experimental design with a non-equivalent control group was employed. The sample consisted of 40 students divided into an experimental group (taught using CTL) and a control group (taught without CTL). Data were collected through pretests and posttests, and statistical analysis, including N-Gain scores, was used to measure learning improvement. The findings revealed a significant difference in posttest scores between the experimental and control groups (*p* < 0.05), with the CTL group achieving a higher average score (89.95) compared to the control group (75.65). The N-Gain analysis further confirmed greater improvement in the experimental class (82.70) than in the control class (57.16). This study contributes to existing literature by empirically validating the effectiveness of CTL in enhancing cognitive abilities in social studies, particularly in local wisdom-based learning an area that has received limited attention in prior research. The results suggest that educators should consider adopting CTL strategies to make learning more meaningful and engaging, particularly in subjects requiring contextual understanding, such as social studies. This research provides evidence supporting CTL as an effective pedagogical approach, offering insights for curriculum developers and teachers aiming to improve student learning outcomes through experiential and context-based instruction.

Keywords: Contextual Teaching and Learning, My Region My Pride, Student's Cognitive Ability

A. Introduction

Education is a business consciously aimed at creating a legacy passed down from one generation to the next. It shapes the next generation, serving as role models through the teachings of previous generations (Rahman et al., 2022). Education plays a vital role in the nation and state, especially in producing high-quality human

resources (Syarbaini Saleh, Toni Nasution, 2020). The function of education is to enhance abilities as well as shape the character of a nation, instilling values that guide the nation's moral and enlightening life. This is where the foundation for independence is built, enabling individuals to seek livelihoods and preserve the nation's culture (Dihe & Wangdra, 2023). One factor that can contribute to a country's development is its education level. Quality human resources are obtained through higher levels of education (Sapri, 2022). The hope is that through education and the implementation of national educational goals, a smart, moral, and successful next generation can be produced. Classroom learning processes are one way to achieve this goal. Learning is a crucial part of education, essential for encouraging change, both in terms of attitudes and learning outcomes.

Education in modern society, as well as in societies undergoing modernization, essentially plays an important role in connecting students with a cultural environment that is constantly changing (Mirdad Jamal 2020). However, the current reality presents a serious challenge: the inability of some students to connect what they learn in school with what they encounter in the real world. This situation has become a major challenge facing our nation and may persist in the future, as the learning process needs to be improved to provide high-quality learning and outcomes that meet expectations.

Education at Madrasah Ibtidaiyah (MI) aims to shape character and provide adequate foundational knowledge so that students are ready to face life's challenges. MI combines a general curriculum with Islamic religious education in an integrated manner, equivalent to elementary schools (SD), but with a focus on a deeper understanding of Islam. The primary goal of education at MI is to produce students who can harmonize the mastery of knowledge with the application of Islamic values. In this context, educators need to evaluate and improve the quality of learning, as well as encourage the development of critical and creative thinking in students. The right learning model significantly influences student learning outcomes, as it serves as a template for developing a curriculum, teaching materials, and learning implementation that aligns with educational objectives, student characteristics, and learning conditions. By selecting the right learning model, the learning process can proceed more systematically and effectively, achieving the desired educational goals (Susanti et al., 2023).

Learning models can be an alternative that allows teachers to choose the method best suited to educational objectives and subject characteristics. This model is flexible, allowing teachers to adjust it as needed and help students find new ways to learn. Learning also includes the entire process of providing learning resources, both before, during, and after learning, as well as the use of various supporting sources. One of the models used in this study is Contextual Teaching and Learning (CTL), which encourages active student engagement by connecting learning materials to real-world problems they face. This approach emphasizes that the material must be

relevant to students' daily lives so that learning becomes more meaningful (Nata, 2019). The CTL philosophy is rooted in constructivism, which prioritizes learning through direct experience and knowledge development. By linking academic knowledge to everyday life, CTL enriches students' learning experiences and increases their motivation to participate in learning (Tri Mashudi et al., 2021). This model also emphasizes local excellence to motivate students and preserve local culture.

By leveraging prior knowledge and experience to build new understanding, students will be motivated to achieve their learning goals. They will also have the ability to apply this knowledge and skills in a variety of situations outside the school environment to solve real-life problems, both individually and in groups with various structures. Furthermore, learning can be made more meaningful by manipulating and exploiting learning tools, learning resources, and engaging in observation activities. This will make learning more active and faster. To boost motivation and attraction, the use of learning strategies and media such as audio, video, reading materials, and textbooks is very useful (Tri Mashudi et al., 2021).

The CTL model is an educational approach that aims to help students find meaning in subject matter by linking academic learning to their personal, social, and cultural contexts. This approach engages students in activities that connect lessons to real life, making learning materials more meaningful and relevant (Erliana Ajeng et al., 2023). Thus, students can more easily remember and understand the material taught. CTL aligns with the principles of constructivism, which emphasizes skill development through interaction with the surrounding environment (Nirwana Anas 2023). In the context of MI, the material "My Region, My Pride" is very appropriate to be applied with a contextual approach because it can introduce students to the richness of their region, such as typical foods, regional languages, and traditional dances (Gustalia & Setiyawati, 2023). However, some students have difficulty connecting the material to their direct experiences, which hinders deeper understanding.

The implementation of the CTL model in the material "My Region, My Pride" can be a good solution for improving cognitive abilities. Cognitive abilities refer to how students learn to adapt and apply knowledge from their surroundings. It is explained that students can play an active role in linking knowledge with reality, rather than being passive in simply collecting information (Gustalia & Setiyawati, 2023). Cognitive abilities emphasize learning as a process that occurs within the human mind. Learning is essentially a process involving mental activity within humans as a result of active interaction with their environment, leading to changes in knowledge, understanding, behavior, skills, and attitudes that are relatively lasting (Sudirman, Nurul Afifah Herman, 2024).

By implementing the CTL model, it is hoped that students can connect knowledge about their region with real experiences, making it easier for them to understand and remember the material. The application of CTL to the material "My Region, My Pride" is also expected to improve students' cognitive abilities, specifically their ability to adapt and apply knowledge in real life. This model encourages students to think critically, work together, and solve problems independently, ensuring they are not just passive in receiving information. This aligns with the values found in Surah Al-Ghashiyah (88:17-20), which teaches the importance of thinking and understanding reality, guiding students to reflect on God's creation to increase their understanding:

اَفَلَا يَنْظُرُوْنَ اِلَى الْاِبِلِ كَيْفَ خُلِقَتْۗ ﴿١٧﴾ وَاِلَى السَّمَاۤءِ كَيْفَ رُفِعَتْۗ ﴿١٨﴾ وَاِلَى الْجِبَالِ كَيْفَ نُصِبَتْۗ ﴿١٩﴾
وَاِلَى الْاَرْضِ كَيْفَ سُطِحَتْۗ ﴿٢٠﴾

Meaning: "17) So don't they pay attention to the camel, how it was created?, 18) And the sky, how it was raised?, 19) And the mountains how it was raised?, 20. And how the earth was spread out?"

The CTL model aims to encourage students to construct knowledge through observation and experience. With a real-world context-based approach, CTL helps students connect material to their experiences, making concepts such as cultural diversity, customs, and regional potential more relevant and understandable. In the context of the material "My Region, My Pride," this model allows students to not only receive theoretical information but also understand the material through direct engagement with their everyday environment. Although the use of learning models such as CTL can improve students' cognitive abilities, many educators still rely on conventional methods, such as lectures, which tend to make learning interactions teacher-centered. This results in low student participation, hindering the development of their thinking and problem-solving skills. At MIS Maura El-Mumtaz, Binjai City, fifth-grade students faced difficulties in terms of cognitive abilities due to the lack of application of appropriate learning models. Therefore, changes were needed to improve learning effectiveness (Safran et al., 2024). This lecture method is considered very easy, simple, and flexible, without requiring special preparation, similar to what was practiced in the fifth-grade class at MIS Maura El-Mumtaz, Binjai City.

The hope is that teachers can apply the CTL model in social studies subjects, particularly on the topic "My Region, My Pride." By applying the CTL model, teachers relate the subject matter to real situations experienced by students, thereby increasing their desire to understand and master the material. This model encourages students to actively learn information rather than just receive it (Ramadan Lubis 2024). With the CTL model, it is hoped that there will be a paradigm shift in learning, making study results more meaningful for students. The process becomes more natural in the form of student activities and experiences, not just a transfer of knowledge from teacher to student. Instead, students can

independently construct the knowledge they receive, in accordance with their learning styles whether auditory, visual, or kinesthetic (Mazmur, 2021).

The CTL model has many advantages, one of which is that it makes it easier for teachers to deliver material in a way that is more easily understood by students. In addition, CTL also helps the student learning process by positioning the teacher as the center of learning, responsible for designing, implementing, and evaluating lessons to achieve educational goals. It is hoped that this model can improve students' cognitive abilities from a low level to a more optimal level. The material "My Region, My Pride" in social studies learning is very important because it helps students recognize and take pride in their regional culture, which is also included in various curricula such as PPKn, IPS, and Arts Culture (Eka Susanti et al. 2024).

This study offers novelty by applying the CTL model to the social studies topic "My Region, My Pride," which focuses on local cultural aspects such as traditional foods, regional languages, and traditional dances. This material has rarely been the main focus in previous CTL research, even though it has great potential for a contextual approach. This study was also conducted in MI, which integrates Islamic values and highlights students' cognitive abilities as the main variable, rather than just general learning outcomes. It is hoped that the results of this study will serve as a reference in selecting local wisdom-based learning models and encourage the implementation of more meaningful and contextual learning approaches in the classroom.

Various research show that CTL model has an effect positive toward students' learning achievement (Shintia et al., 2023; Safnowandi, 2021; Erni et al., 2020; Isro' Riskiyanto, 2024; Anggriani et al., 2021; Manik & aulina, 2021; Siagian, 2020; Sry Anriyani, et al. 2023). Although various literature mentions that the CTL model can increase student involvement, build meaningful understanding, and make learning more relevant to students' real lives, the reality on the ground shows a different situation. Ideally, students at MI level should be able to understand Social Studies material, especially "My Region, My Pride," with a contextual approach that connects the material with their environment, culture, and daily experiences. However, at MIS Maura El–Mumtaz, Binjai City, many teachers still apply conventional methods such as lectures. This results in learning being less interactive, not relevant to students' experiences, and teacher-centered. As a result, students' cognitive abilities to understand and relate material to real-life situations become low. In fact, the CTL approach emphasizes the active role of students in building knowledge through observation and direct experience.

B. Methods

This study used a quantitative approach with a quasi-experimental design. The aim was to determine the differences in student learning outcomes between classes using the CTL model and those not using it. The study was conducted at MIS Maura El-

Mumtaz in Binjai City, involving two groups of fifth-grade students: an experimental class and a control class, each consisting of 20 students. A pre-test was administered to both classes to measure students' prior knowledge, followed by different treatments. The experimental class used the CTL model, while the control class used conventional learning methods (Abraham & Supriyati, 2022). After the treatments were administered, a post-test was given to both groups to assess changes in student learning outcomes following the implementation of the different models.

The sample used in this study consisted of 40 students, divided into two groups: an experimental group and a control group, with each group consisting of 20 students. The pre-test and post-test were the primary instruments in this study, consisting of questionnaires to measure students' cognitive abilities related to the material being studied. These questionnaires were designed to obtain data on students' knowledge and understanding before and after the treatment. The data obtained were then analyzed using statistical tests such as t-tests to determine whether there were significant differences between the two groups after being given different treatments. Furthermore, normality and homogeneity tests were conducted first to ensure that the data met the assumptions required for further analysis (Veronica et al., 2022). Using a quasi-experimental design, this study aimed to compare two groups given different treatments, thus concluding whether the implementation of the CTL model had a significant positive impact on students' cognitive abilities in the material being taught, compared to conventional learning methods.

C. Results and Discussion

This study uses descriptive analysis to assess cognitive abilities, involving 20 students in each class: the experimental class and the control class. There are 20 students in the experimental class and 20 students in the control class. Each class is given a different treatment. From the results of data processing from each class, the values obtained include the number of students, maximum value, minimum value, mean, and standard deviation, which can be seen in table 1 below.

Table 1. Descriptive Statistics of Pre-test and Post-test Data on the Cognitive Abilities of Experimental and Control Class Students

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Experiment Pre-Test	20	31	55	42.70	6,036
Post-Test Experiment	20	83	96	89.95	3,203
Pre-Test Control	20	34	49	42.45	4,707
Post-Test Control	20	68	82	75.65	3,801
Valid N (listwise)	20				

Based on the descriptive statistics table of the cognitive ability scores of the students, the results in the experimental class show that the pre-test score has an average of

42.70, with a range of values from a minimum of 31 to a maximum of 55. After the application of the CTL model, the post-test score increased significantly, with an average of 89.95, the lowest score of 83, and the highest score of 96. Meanwhile, in the control class, the pre-test average was 42.45, with the lowest score of 34 and the highest score of 49. After the treatment, the post-test average of the control class rose to 75.65, with the lowest score of 68 and the highest score of 82.

Normality Test: This test aims to check whether the pre-test and post-test critical thinking data from the control and experimental classes follow a normal distribution or not. If the data meets the normality assumption, then the t-test can be used. For this purpose, data normality was analyzed using IBM SPSS 25 (for both the control and experimental classes), and the results are presented in the following table.

Table 2. Normality Test Results Cognitive Abilities

		Kolmogorov-Smirnov a			Shapiro-Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
Ability Cognitive	Experiment Pre-Test	,146	20	,200 *	,972	20	,803
	Post-Test Experiment	,156	20	,200 *	,958	20	,511
	Pre-Test Control	,133	20	,200 *	,948	20	,334
	Post-Test Control	,118	20	,200 *	,970	20	,748

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Based on the normality table above, it is known that this study uses the Shapiro-Wilk Test to test the normality of the data. The significance value (Sig.) in the experimental class shows that the pre-test is 0.83 and the post-test is 0.51. Meanwhile, in the control class, the pre-test has a Sig. of 0.33, and the post-test is recorded at 0.74. Because all Sig. values in both classes (pre-test and post-test) are greater than the threshold of 0.05, according to the decision-making criteria, the samples from the experimental and control classes come from a normally distributed population.

Homogeneity Test: This test aims to determine whether two or more groups of sample data come from populations that have the same variance. In this study, homogeneity was tested using Levene's Test in SPSS 25 with a significance level (α\alphaα) of 0.05. The test hypothesis is:
H_0: Variance population between group No same (not homogeneous).
H_a: Variance population between group the same (homogeneous)

Table 3. Results of the Test Homogeneity Thinking Ability

		Levene Statistics	df1	df2	Sig.
Cognitive Abilities	Based on Mean	,927	1	38	,342
	Based on Median	,825	1	38	,370
	Based on Median and with adjusted df	,825	1	37,650	,370
	Based on trimmed mean	,935	1	38	,340

Based on table results test using SPSS 25, the significance value (based on *based mean*) recorded by 0.342 more tall from the threshold 0.05. Therefore, H_0 rejected and H_a accepted, meaning variance between group considered together with Thus, the sample from class experiments and classes control can stated originate from population that has distribution variance homogeneous.

Hypothesis Testing: This study aims to test the influence of the application of the CTL model on the cognitive abilities of students, involving two groups: the experimental class and the control class. After conducting normality and homogeneity tests, the results show that the data from both classes are normally distributed and have homogeneous variance. Therefore, the analysis continued with a t-test using a significance level of 0.05. The type of t-test used is the independent sample t-test, which is used to determine whether there are differences in critical thinking abilities between students in the experimental class, who received the CTL model treatment, and students in the control class, who did not receive the same treatment. Based on the results of the prerequisite tests and statistical analysis, the pre-test and post-test data from both classes meet the assumptions of normality and homogeneity. Thus, hypothesis testing through the independent sample t-test can be implemented. The formulation of the hypothesis is as follows:

Table 4. Results of Independent Testing Sample t -test Data Post Test Class Experiment and Control Cognitive Ability

Group Statistics

Class		N	Mean	Standard Deviation	Std. Error Mean
Cognitive Abilities	Experiment Post-Test	20	89.95	3,203	,716
	Post-Test Control	20	75.65	3,801	,850

Table 5. Student's t-table (two- tailed, α = 0.05)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Standard Error Difference	Lower	Upper
Cognitive Abilities	Equal variances assumed	,927	,342	12,865	38	,000	14,300	1,112	12,050	16,550
	Equal variances not assumed			12,865	36,938	,000	14,300	1,112	12,048	16,552

Based the results analysis *independent sample t- test* shows that degree freedom (df) is 38, with mark significance (2-tailed) of 0.000. Because the value significance the is smaller than 0.05 (0.000 < 0.05), and the calculated t value (12.865) is greater big

compared to the t table (2.024), then can concluded that H_1 accepted and H_0 rejected. With Thus, there are difference which significant in ability think critical between participant educate in class experiments and classes control after application of the CTL model.

Difference This is also supported by the acquisition mean post-test score, where *the* class experiment reach score 89.95, while class control only got 75.65. Because the average value in the class experiment higher, can concluded that the use of the CTL model provides impact positive to improvement ability cognitive students. In other words, the application of the CTL model has been proven effective in develop ability cognitive participant educate class V on material *My area My pride.*

N-Gain Score Test: was performed to determine the effectiveness of using a learning model in the research. The N-gain score test is calculated by determining the difference between the pre-test and post-test scores. The N-gain score values are:

Table 6. N-Gain Score Table

Descriptive	Class			Statistics	Std. Error
NGain_Percent	Experiment	Mean		82,6968	,97424
		95% Confidence Interval for Mean	Lower Bound	80,6577	
			Upper Bound	84,7359	
		5% Trimmed Mean		82,6368	
		Median		81,4751	
		Variance		18,983	
		Standard Deviation		4.35695	
		Minimum		75.36	
		Maximum		91.11	
		Range		15.75	
		Interquartile Range		6.65	
		Skewness		,114	,512
		Kurtosis		-,685	,992
	Control	Mean		57,1579	1.99624
		95% Confidence Interval for Mean	Lower Bound	52,9798	
			Upper Bound	61,3361	
		5% Trimmed Mean		57,2898	
		Median		57,7976	
		Variance		79,699	
		Standard Deviation		8.92744	
		Minimum		39.22	
		Maximum		72.73	
		Range		33.51	
		Interquartile Range		14.43	
		Skewness		-,266	,512
		Kurtosis		-,470	,992

Based on the descriptive table, it is known that the average N-Gain in the experimental class is 82.70, while in the control class, it is only 57.16. This shows a significant difference in the improvement of learning outcomes between the two

classes after the treatment was applied. The experimental class has a minimum value of 75.36 and a maximum of 91.11, with a range of 15.75. Meanwhile, the control class has a minimum value of 39.22 and a maximum of 72.73, with a wider range of 33.51.

The N-Gain is used to measure the effectiveness of a learning treatment or intervention. A high N-Gain value indicates that students have experienced significant improvement in their learning outcomes. In this case, the experimental class shows an average increase of 82.70, which falls into the high category, whereas the control class, with a score of 57.16, falls into the medium category.

This suggests that the treatment applied in the experimental class, which could be a specific learning model, method, or media, has a significantly more positive impact on improving students' understanding compared to the conventional methods used in the control class. Therefore, it can be concluded that the experimental class experienced higher learning outcomes, and the differences in the average values, standard deviation, range, and confidence intervals all point to the conclusion that the experimental class treatment was more effective in increasing students' understanding.

Based on the results of the descriptive statistics analysis of participants' cognitive abilities, the pre-test scores of the experimental class had an average value of 42.70, with the lowest value being 31 and the highest value being 55. After receiving treatment using the CTL model, the post-test scores had an average of 89.95, with the lowest score being 83 and the highest score being 96. Meanwhile, in the control class, the average pre-test score was 42.65, with the lowest value being 34 and the highest value being 49. The post-test average score in the control class was 75.65, with the lowest score being 68 and the highest score being 82.

As for the criteria, it can be determined based on the significance value (Sig.). The general rule is that if the Sig. value < 0.05, the regression model meets the criteria. The data processing results conclude that the Sig. value = 0.000, which means the regression model is significant, and the CTL model influences students' cognitive abilities in the material "My Region, My Pride."

The success of the learning process is not only assessed by how well students perform in class but also by how far they are able to explore the competencies they already have. One of the methods for improving the quality of learning from the performance side and students' ability to apply knowledge in their daily lives is by enhancing students' skills in each subject. This is especially important because social studies lessons include socially structured knowledge in a systematic, methodical, and mutually beneficial way.

The effectiveness of any learning method can only be proven after observing the results in student performance. Unfortunately, the current learning process is still

dominated by the teacher's role, and the methods used tend to be monotonous. This causes students to be less capable of facing real-world situations, as they are not given the chance to solve problems independently and are less actively involved in the learning process. Additionally, the lack of teacher confidence in applying new methods results in the learning process being limited to activities such as lecturing, note-taking, explaining, and assigning tasks. If this pattern continues, the learning environment will remain suboptimal.

Students' cognitive abilities are also greatly influenced by the quality of teaching. A creative teacher can help students understand concepts more quickly and develop their thinking abilities. Therefore, it is crucial for teachers to select the appropriate learning model that aligns with the teaching materials. The alignment between learning activities and the steps in the learning model will contribute to the development of critical thinking skills in students.

This study examined the effect of the CTL model on students' cognitive abilities in the topic "My Region, My Pride" with fifth-grade students at MIS Maura El-Mumtaz in Binjai City. The results showed that the implementation of the CTL model led to a significant increase in students' cognitive abilities. The experimental class' average post-test score reached 89.95, while the control class, using conventional learning methods, achieved only 75.65. The independent sample t-test results showed a significant difference between the two groups, with a t-value of 12.865 and a significance level of 0.000, proving that the CTL model had a positive effect on improving students' cognitive abilities. Additionally, the N-Gain score showed a higher average increase in the experimental class (82.70) compared to the control class (57.16), indicating that the CTL model was more effective in improving student learning outcomes.

Comparing the results of this study with previous research shows similar findings. Research by (Anggriani et al., 2021) regarding the application of the Problem-Based Learning (PBL) model in social studies learning showed that PBL also resulted in significant improvements in students' cognitive abilities, similar to the results found in this study. Both learning models, CTL and PBL, use an active and contextual approach that connects the subject matter to students' real-life experiences, which has been shown to be more effective than conventional methods. Research by (Sari & Rosidah, 2023) also supports these findings, where the application of the PBL model in social studies learning showed significant improvements in learning outcomes and higher student engagement, similar to the findings from the application of the CTL model in this study. Thus, this study is in line with the findings of other studies that show that active-approach learning models, such as CTL and PBL, are more effective in improving students' cognitive abilities compared to conventional learning methods.

Based on the results of the research, the CTL model has been proven to have an influence on students' critical thinking abilities. This is due to the CTL approach, which emphasizes active and independent learning. The findings also show that the CTL model has a positive impact on improving students' cognitive abilities. In other words, there is a significant influence of the CTL model on students' cognitive abilities.

D. Conclusions

Based on the results and discussion, it can be concluded that there is an influence of the CTL model on students' cognitive abilities in the material "My Region, My Pride" in fifth-grade students at MIS Maura El-Mumtaz in Binjai City. This is evident through the significant improvement in students' cognitive abilities before and after the application of the CTL model. The results of the paired sample t-test in the experimental class show a significance value of 0.000 < 0.05, indicating a significant difference between the pre-test and post-test scores after the implementation of the CTL model. Meanwhile, the control class, which used conventional learning methods, did not show significant improvement. This demonstrates that students who study with the CTL model are better able to understand the material in a deeper way because they are actively engaged in the learning process, which is connected to their real-life experiences and local culture. The application of the CTL model also encourages students to think critically, actively participate in discussions, and take pride in their regional culture. Thus, the CTL model has been proven effective in improving students' cognitive abilities in social studies lessons. Therefore, it is recommended that educators consider using the CTL model as an alternative to create more meaningful, contextual, and enjoyable learning, especially in subjects related to culture and the environment around students.

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