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The Use of Contextual Learning Approach to Improve Elementary School Students' Understanding of Science Concepts and Social Awareness

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ABSTRACT

Contextual learning connects instructional content with real-life experiences, promotes active participation, and fosters social interaction among students. This study aimed to analyze the effect of a contextual learning approach on elementary school students' understanding of science concepts and social awareness. The research employed a quasi-experimental design conducted at an elementary school in Pekanbaru, involving two classes: an experimental class taught using the contextual approach and a control class taught using conventional methods. Data were collected through science concept understanding tests and social awareness questionnaires and analyzed using descriptive and inferential statistics. The t-test results indicated that the significance values of post-test scores for both science concept understanding and social awareness were less than $\alpha = 0.05$, leading to the rejection of H_0. This demonstrates a significant difference between the experimental and control classes at the 95% confidence level. Further analysis using N-gain scores showed that the experimental class achieved higher improvement in both science concept understanding and social awareness compared to the control class. These findings indicate that the contextual learning approach has a positive and significant influence on students' conceptual understanding and social awareness.

Keywords*: *contextual learning, science concept understanding, social awareness, science learning, elementary school

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INTRODUCTION

Science learning is very important as it enables students to experience and understand products, processes, attitudes, and technology in science. Particularly, the aspect of scientific attitude is one of the essential elements that need to be developed in science learning. However, many challenges arise in teaching science at the elementary school level, such as students struggling to grasp science concepts due to ineffective and incomplete teaching steps implemented in class (Zahroh et al., 2020). Other issues include numerous foreign terms, overly dense material, limited learning media, lack of student interest in certain topics, teaching methods that do not align with the given material, mismatched lesson content with allocated time, and inappropriate use of learning media. These factors can contribute to low motivation and understanding of science learning among elementary school students (Awang, 2020). To overcome these issues, teachers in elementary schools need to improve their skills and creativity in managing the learning process.

According to research findings, the science learning process is still suboptimal, with a performance rate of only 43.08% in elementary school science education (Dwisetiarezi & Fitria, 2021). Additional challenges identified as contributing to students' difficulties in learning science include interest, motivation, self-confidence, study habits, and aspirations (Awang, 2020). From these findings, it can be concluded that the understanding of science learning cannot be viewed from just one perspective; many factors must be considered to ensure students can successfully engage in science learning, particularly those who struggle with the subject.

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Encouraging students to participate in learning is an activity aimed at activating students in the learning process through well-established interactions between teachers and students. The implementation of learning encompasses three aspects: cognitive, affective, and psychomotor. To achieve this goal, teachers must enhance their creativity in teaching. The teacher plays a crucial role in determining the success of the learning process in schools. Many factors influence students' learning comprehension, with one of the primary factors being the learning process itself. Effective learning should be student-centered, where students are no longer passive recipients but actively engage as partners in the learning process. In this approach, students act as active learners, while teachers function as facilitators and creative mediators. Student-centered learning allows students to understand lessons more easily through firsthand experiences gained during learning activities. Additionally, teachers do not dominate the teaching process; instead, they help create a conducive environment, offer motivation, and provide guidance so that students can develop their potential and creativity through learning activities, leading to optimal learning outcomes (Sardiman, 2011).

The learning process becomes more effective when students actively engage in meaningful tasks and interact intensely with lesson materials. Student involvement in learning significantly increases the likelihood of internalizing knowledge (Benny, 2010). One instructional approach that fosters knowledge exchange between teachers and students, as well as between students themselves thereby enhancing enthusiasm and a sense of responsibility is contextual learning. The application of this approach represents a shift in teaching paradigms within schools. Teachers no longer dominate classroom activities but act more as facilitators and mediators of the learning process. Contextual learning helps develop essential understanding, fostering individuals with empathy who can think critically both for themselves and for their nation. It also enhances students' ability to grasp concepts, encourages teamwork, cultivates critical thinking skills, and promotes social awareness.

Contextual learning provides students with opportunities to share ideas and strengthens their collaboration skills in solving problems. It encourages mutual respect for different opinions both inside and outside of their peer groups, maximizes student participation by creating a fun learning environment, fosters better student interaction, and ensures the learning process is more student-oriented and integrated with their surroundings. Based on the outlined background, this research aims to analyze the effectiveness of contextual learning in enhancing students' understanding of science concepts, assess its impact on improving social awareness, and offer recommendations for teachers on implementing contextual learning as an alternative teaching strategy.

LITERATURE REVIEW

Contextual Learning

Contextual Learning is an instructional method that establishes a strong connection between lesson material and students' real-life experiences. This approach enables students to see the relevance of what they learn in school to their daily lives (Ansya, 2023). Contextual Teaching and Learning (CTL) brings the real world into the classroom, encouraging students to connect their existing knowledge with its application in their everyday lives. Students acquire knowledge and skills gradually from limited contexts and through self-construction, equipping them to solve problems (Sepriady, 2016). Thus, contextual learning is a learning concept that helps teachers link the material being taught to students' real-world experiences and encourages students to relate their knowledge to its practical application in daily life. Learning becomes more meaningful when students experience what they learn first hand rather than merely memorizing it.

Astuti & Najuba (2024) integrate the CTL method through four main activities. The first activity involves teachers and students collaboratively planning lessons that incorporate real-world contexts. The next activity is conducting interactive sessions that encourage active student participation. Following this, teachers observe student engagement to assess their involvement during the learning process. Finally, learning

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outcomes and student activities are evaluated using questionnaires to measure participation. Overall, the CTL method focuses on solving problems relevant to students' lives. Learning does not only occur in the classroom but also involves various contexts outside the classroom. CTL encourages students to become active and independent learners by implementing key steps such as constructivism, inquiry, questioning, modeling, reflection, learning community, and authentic assessment. These steps can be simplified into the following stages: identify, explore, apply, discuss & reflect, and evaluate.

In the identify stage, students are introduced to real-world contexts that can be linked to the lesson material. They are guided to identify relevant problems in their daily lives. At this stage, students engage in constructivism , building their own knowledge through personal experiences and reflections on their surroundings. The next stage is exploration , where students delve into the concepts they are learning. Teachers present lesson concepts related to students' daily lives, allowing them to connect academic content with real-world situations. Indirectly, students apply an inquiry approach, while teachers use questioning to stimulate critical thinking and guide students in investigating and discovering answers.

The approaching stage follows**,** where students use the knowledge they have gained in real-life situations. Here, students engage in activities involving motor, cognitive, and even affective skills. Teachers facilitate learning by using interactive teaching media or providing models as guides. Students who can effectively apply concepts will find it easier to complete assigned tasks.

The next stage is discussion & reflection , where students work in groups to collaborate, share ideas, and reflect on their learning. They may also present their discussions and receive peer feedback, indirectly applying the learning community principle. The final stage is evaluation . To measure the success of learning, assessments are conducted, such as final tests to evaluate students' understanding of the concepts learned. Authentic evaluation is essential to assess students' ability to apply their knowledge effectively.

Understanding Science Concepts

Understanding a concept refers to the ability to receive, absorb, and comprehend information or material acquired through direct observation or experience, which can then be applied in daily life. Conceptual understanding involves interpreting and internalizing the meaning of learned material—how well students can receive, assimilate, and grasp the lessons taught by the teacher, as well as the extent to which they understand what they read, see, do, or experience. A student is considered to have understood a concept if they can explain or describe it further using their own words (Sari et al., 2019)

To measure the depth of students' conceptual understanding, the following indicators can be used: a) Explanation Ability **.** assessing students' ability to explain scientific concepts in their own words; b) Conceptual Linking Ability **,** evaluating whether students can connect learned concepts to their daily experiences or natural phenomena they encounter; c) Application Ability , observing how students apply scientific concepts in real- world situations; d) Analytical Ability , xamining students' capacity to analyze information related to the concepts they have learned; e) Classification Ability , determining whether students can categorize information or objects based on specific characteristics relevant to science learning; f) Critical Thinking Ability , assessing students' ability to process information by questioning sources, evaluating arguments based on evidence, or identifying misconceptions (Hidayati et al., 2023).

Social Awareness

Social awareness is the ability to read, understand, and comprehend what people around us are experiencing. This understanding forms the basis for appropriate action in situations that we and others experience around us. Accuracy in reading is an important basis for every further step. It refers to patterns of interaction, communication skills and awareness to meet the needs of those closest to us. (Hartawati, 2022). Social awareness in students can be measured through several methods that focus on observation, assessment, and social interactions of a person. Social awareness in elementary school students can be interpreted as the

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ability of students to understand and interpret the emotions, needs, and perspectives of others in their social environment.

In the context of science learning, social awareness refers to students' ability to see the relationship between scientific concepts and social reality. They can apply the knowledge they learn to solve problems in society and the environment, and contribute to sustainable development. This includes a deep understanding of how science can be applied to address social and environmental challenges, and improve human well-being. When associated with science learning, social awareness can shape students' character and improve their social skills. Among them are the following: a) being able to read situations. This means that students are able to understand the context of the surrounding environment, for example by being aware of environmental problems around them; b) Critical information. Students who are critical of information mean that students have the ability to analyze, evaluate, and interpret information obtained from both environmental and digital sources carefully and in depth. They do not immediately accept the information, but will conduct further examination to ensure the truth and relevance of the information; c) have empathy for the environment because students are taught to understand environmental issues such as climate change, pollution, resource crises and so on. Science learning must integrate the development of empathy for the environment so that students can understand the interconnection between humans and ecosystems (Sari, 2021); d) communication skills, namely the ability of students to convey ideas, thoughts, or information to others effectively and clearly. Good communication skills indicate that the student has indicated social awareness in himself. One indicator of students who have social awareness can be seen from their attitudes and speech when communicating in accordance with applicable norms and ethics (Diana et.al., 2023); and finally e) the ability to collaborate, namely a person's ability to work together with others effectively in achieving common goals. Collaborating means involving students to work together in science learning activities, for example, collaboration in scientific projects. Collaboration between students can increase their social awareness. Because students will learn to work together in teams, deliberate with each other, and share responsibilities. Collaboration in scientific projects not only increases students' understanding of concepts but also builds social awareness through interaction and cooperation (Hidayati, 2022)

METHOD

This study is a quasi-experimental study, which is a treatment to be used as a change in the conditions of several research subjects (Lestari, et al., 2019). This study is an experiment with a *pretest* and *posttest design* conducted on two class groups, namely the experimental class and the control class. Where the experimental class is applied to learning with a contextual learning approach and in the control class conventional learning. Before the study was conducted, the two classes were first given *a pretest* and then given *a posttest* . This research was conducted at SD Negeri 117 Pekanbaru in the even semester of the 2024/2025 academic year. The population in this study were all 5th grade students of public elementary schools in Pekanbaru in the even semester of the 2024/2025 academic year consisting of two classes. The total number of students in both classes was 4 2 people. The sample in this study were 5th grade students of public elementary schools in Pekanbaru using the *Random sampling technique* , namely all classes in the population have an equal opportunity to be samples, from the two classes one class was selected that studied using a contextual learning approach, and one class using conventional learning methods.

Data collection was carried out by means of tests and questionnaires to measure students' ability to understand science concepts, while for understanding Social Awareness, a questionnaire was given. The test instrument in the form of test questions was used to measure students' ability to understand science concepts. The test questions were in the form of multiple choice questions totaling 17 items. The test questions were given as *a pretest* and *posttest* for the experimental and control classes. The test questions were in the form of multiple choice questions that measured the ability to understand science concepts. The test questions were tested first before being used in the study. The results of the Trial were analyzed to evaluate the quality of the

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questions, considering validity and reliability as assessment criteria. The results of the analysis showed that the test question instrument had met the validity requirements with all questions showing a correlation coefficient above 0.31, and met the reliability criteria which were classified as high with a value of 0.6966. The non-test instrument used was a student social awareness questionnaire. This questionnaire was used to measure the level of student social awareness. The questionnaire consists of statements that will be filled in by students before and after the action. The questionnaire was filled in with four alternative answers, namely 1 to state disagree, 2 to state disagree, 3 to state agree, and 4 to state strongly agree.

This study uses a quantitative approach, so the data analysis used is descriptive analysis techniques and inferential data analysis. Descriptive statistics are used to provide an overview and present a summary of data from the population so that the information as it is from the data can be obtained systematically and clearly. For inferential analysis techniques, a hypothesis test will be carried out with a t-test . The data that has been collected through the science concept understanding test and non- *social awareness test* will be analyzed to answer the research objectives that have been set. IBM SPSS Statistics 25 software will be used to process data in this study.

RESULTS AND DISCUSSION

At the beginning of the meeting, students from class VA and VB were given questions (*pretest*) as an initial evaluation. Students in class VB carried out learning using a contextual learning approach, while class VA carried out learning as usual conventionally. After all the learning series were completed, both were given questions (*posttest*) at the last meeting. *The pretest* and *posttest data* were tested for normality, homogeneity, and the test of equality of two averages, then the researcher analyzed the increase in conceptual abilities and the increase in *social awareness* of students before and after using the contextual learning approach.

Descriptive Analysis

This study was conducted at SDN in Pekanbaru with the aim of analyzing the effect of contextual learning approaches on students' ability to understand science concepts and *social awareness* . Learning in the experimental class using teaching modules that integrate contextual learning approaches. While in the control class, conventional learning was carried out. The treatment in this study was carried out in 5 meetings. The first meeting was a pretest, the second meeting was learning with the material of biological and non-biological natural resources, the third meeting was learning with the material of renewable and non-renewable natural resources, the third meeting was learning with the material of the impact of the use of natural resources and their conservation efforts, the sixth meeting was a posttest, students were given tests in the form of descriptions and questionnaires in both the experimental and control classes. Here are the results of the study. From the results of *the pretest* and *posttest* of students' ability to understand science concepts that have been carried out in the experimental class and control class, it can be analyzed descriptively in Table 1 below.

Table 1. Pretest and Posttest Results Data on Science Concept Understanding Ability of Experimental Class and Control Class

Information	Pretest		Posttest	
	Experiment	Control	Experiment	Control
Number of Samples (n)	22	20	22	20
Average	61.18	52.65	81.82	66.08
Median	58.82	58.82	82.35	67.65
Variance	178.75	293.07	243.56	125.08
Standard Deviation	13.37	17.12	15.61	11.18
Minimum Score	29.41	17.65	41.18	52.94

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Maximum Score	82.35	82.35	100.00	94.12
Range	52.94	64.70	58.82	41.18

The data in Table 1 shows a significant difference in the improvement of science concept understanding between the experimental class (using a contextual approach) and the control class (conventional method). In the experimental class, the average score increased from 61.18 to 81.82 , while the control class only increased from 52.65 to 66.08. The median of the experimental class also jumped from 58.82 to 82.35, much higher than the control class which only increased by 8.83 points. This proves the effectiveness of the contextual approach in improving conceptual understanding. The experimental class showed greater variation in results after the intervention. Its posttest variance increased from 178.75 to 243.56, with a standard deviation of 15.61 and a range of 58.82 , indicating a different impact on each student. In contrast, the control class experienced a decrease in variance (125.08) and standard deviation (11.18), indicating a more homogeneous result. Although the experimental class achieved a perfect maximum score (100), its minimum score (41.18) was still lower than the control class (52.94), suggesting that there were students who were less responsive to this approach. Contextual learning has proven to be superior in increasing averages and highest achievement, but the variation in results requires a more personalized approach to ensure that all students develop optimally. Meanwhile, conventional methods produced more stable, although limited, improvements. This needs to be supported by further statistical analysis to validate the significance of the differences.

From the results of *the pretest* and *posttest* of students' Social Awareness which were carried out in the experimental class and control class, they can be analyzed descriptively in Table 2 below.

Table 2. Pretest and Posttest Social Awareness Results Data for the experimental and control classes

Information	**Pretest**		**Posttest**	
	Experiment	**Control**	**Experiment**	**Control**
Number of Samples (n)	22	20	22	20
Average	76.06	76.92	87.96	80.83
Median	76.67	78.33	87.50	80.00
Information	**Pretest**		**Posttest**	
	Experiment	**Control**	**Experiment**	**Control**
Variance	69.98	57.68	27.37	39.32
Standard Deviation	8.37	7.59	5.23	6.27
Minimum Score	61.67	58.33	78.33	70.00
Maximum Score	95.00	93.33	98.33	90.00
Range	33.33	35.00	20.00	20.00

The pretest and posttest data presented in Table 2, it shows interesting developments in increasing social awareness in both classes. The experimental class using the contextual approach experienced an average increase of 11.90 points, while the control class only increased by 3.91 points . A more significant difference was seen in the median value , the experimental class increased by 10.83 points, while the control class only increased by 1.67 points. This proves that the contextual approach is more effective in increasing students' social awareness than conventional methods. The experimental class showed a decrease in variance from 69.98 to 27.37 and a standard deviation from 8.37 to 5.23, indicating that students' social skills became more homogeneous after the intervention. The control class also experienced a decrease in variance and standard deviation, but not as large as the experimental class. The minimum score of the experimental class increased significantly (16.66 points), exceeding the increase in the control class (11.67 points). Meanwhile, the maximum score of the experimental class reached 98.33 (up 3.33 points), while the control class actually

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decreased 3.33 points to 90.00. This finding reveals that the contextual approach not only improves overall social awareness but also reduces the gap in understanding between students, especially by helping students who initially have lower levels of social awareness. However, descriptive analysis alone is not enough to conclude the significant effect of this approach. Further inferential analysis is needed to test the hypothesis and validate the effectiveness of the contextual approach in improving students' understanding of science concepts and social awareness .

Inferential Analysis

Pretest data analysis consists of prerequisite tests (Normality Test and Homogeneity Test) and average similarity test. The normality test was conducted to determine whether the *pretest data* of the concept understanding of the sample class students were normally distributed or not. The data normality test used the *Kolmogorov-Smirnov test* . The results of the normality test of the sample class data are presented in Table 3.

Table 3. Results of the Normality Test of Sample Class *Pretest* Score Data

Pretest	*Kolmogorov-Smirnov*			Conclusion
	Statistics	*df*	*Sig.*	
Experimental Class	0.152	22	0.200	H_0 accepted
Control Class	0.191	20	0.055	

Based on Table 3, the significance value of the experimental class and the control class is more than $\propto$= 0,05so that H_0it is accepted and H_1rejected. This shows that the *pretest* score data of the sample class is normally distributed at a significance level of 95%. Normality test is conducted to find out the *pretest data social awareness* of students in the sample class is normally distributed or not. Data normality test using the *Kolmogorov-Smirnov test* . The results of the normality test of the sample class data are presented in Table 4.

Table 4. Results of the Normality Test of *Pretest* Score Data *Social Awareness* Sample Class

Pretest	*Kolmo gorov-Smirnov*			Conclusion
	Statistics	*df*	*Sig.*	
Experimental Class	0.137	22	0.200	H_0 accepted
Control Class	0.168	20	0.139	

Based on Table 4 , the significance value of the experimental class and the control class is more than $\propto$= 0,05so that H_0it is accepted and H_1rejected. This shows that the *pretest* score data of the sample class is normally distributed at a significance level of 95%. The homogeneity test is used to determine whether the *pretest data* of students' conceptual understanding of the sample class has homogeneous variance or not. The homogeneity test uses the *Levene- Test.* The results of the homogeneity test of *the pretest data* on conceptual understanding are as in Table 5.

Table 5. Results of the Data Homogeneity Test for *Pretest Scores* of Concept Understanding Sample Class

Levene Statistics	*df1*	*df2*	*Sig.*	Conclusion
1,097	1	40	0.301	H_0accepted

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Based on Table 5, the significance value is more than ∝= 0,05so H_0it is accepted and H_1rejected. This shows that the *pretest* score data of the sample class concept understanding has a homogeneous variance at a significance level of 95%. Homogeneity test is used to determine *pretest data social awareness* of students in sample classes with homogeneous variance or not. Homogeneity test using *Levene-Test. Results of homogeneity test of pretest* data *social awareness* as in Table 6.

Table 6. Results of *Pretest* Score Data Homogeneity Test *Social Awareness* Sample Class

Levene Statistics	*df1*	*df2*	*Sig.*	Conclusion
0.298	1	40	0.588	H_0accepted

Based on Table 6, the significance value is more than ∝= 0,05so H_0it is accepted and H_1rejected. This shows that the pretest score data of the sample class *social awareness* has a homogeneous variance at a significance level of 95%. The results of the homogeneity test show that the *pretest data* of the concept understanding of the sample class has homogeneous variance, therefore a test of the similarity of two means can be carried out using the *Independent Sample T-Test.* The results of the test of the similarity of two means of the *pretest data* of the concept understanding of the sample class are presented in Table 7. The detailed test results are in Appendix 14.

Table 7. Results of the Equality Test of Two Average *Pretests* of Sample Class Concept Understanding

Pretest	N	Average	Standard Deviation	*Sig. (2-Tailed)*	Conclusion
Experimental Class	22	61.18	13.37	0.078	H_0 accepted
Control Class	20	52.65	17.12		

The results in Table 4.8 show that the significance value is more than ∝= 0,05so that H_0it is accepted and H_1rejected. This shows that there is no difference between the average *pretest data of* the sample class concept understanding. at a significance level of 95%. The results of the homogeneity test show the *pretest data social awareness* sample class has homogeneous variance, therefore the test of equality of two means is carried out by *Independent Sample T- Test* with the assumption that both variances are homogeneous. The results of the test of equality of two means of *pretest data social awareness* sample classes are presented in Table 8.

Table 8. Results of the Equality Test of Two *Social Awareness Pretest* Averages Sample Class

Pretest	N	Average	Standard Deviation	*Sig. (2-Tailed)*	Conclusion
Experimental Class	22	76.06	6.57	0.731	H_0 accepted
Control Class	20	76.92	7.59		

The results in Table 8 show that the significance value is more than 0 ∝= 0,05so it $H_0$is accepted and H_1rejected. This shows that there is no difference between the average *pretest data. social awareness* sample class at a significance level of 95%. Posttest data analysis consists of prerequisite tests (Normality Test and Homogeneity Test) and hypothesis tests. The normality test was conducted to determine whether the *Posttest data* of the students' conceptual understanding of the sample class was normally distributed or not. The data normality test used the *Kolmogorov-Smirnov test* . The results of the normality test of the sample class data are presented in Table 9.

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Table 9. Results of the Normality Test of *Posttest* Score Data for Understanding Concepts Sample Class

Posttest	*Kol mogorov-Smirnov*			Conclusion
	Statistics	*df*	*Sig.*	
Experimental Class	0.184	22	0.051	H_0 accepted
Control Class	0.157	20	0.200	

Based on Table 9, the significance value of the experimental class and the control class is more than ∝= 0,05so that H_0it is accepted and H_1rejected. This shows that the *Posttest* score data of the sample class concept understanding is normally distributed at a significance level of 95%. Normality test was conducted to find out the *Posttest data. social awareness* of students in the sample class is normally distributed or not. Data normality test using the *Kolmogorov-Smirnov test* . The results of the normality test of the sample class data are presented in Table 10.

Table 10. Results of *the Posttest* Score Data Normality Test *Social Awareness* Sample Class

Posttest	*Kol mogorov-Smirnov*			Conclusion
	Statistics	*df*	*Sig.*	
Experimental Class	0.167	22	0.111	H_0 accepted
Control Class	0.103	20	0.200	

Based on Table 10, the significance value of the experimental class and the control class is more than ∝= 0,05so that H_0it is accepted and H_1rejected. This shows that the *Posttest social awareness* score data of the sample class is normally distributed at a significance level of 95%. Homogeneity test is used to find out the *Posttest data* understanding of the concept of students in the sample class with homogeneous variance or not. Homogeneity test using the *Levene-Test. Results of the Posttest* data homogeneity test understanding of concepts such as Table 11.

Table 11. Results of the Data Homogeneity Test for *Posttest Scores* of Concept Understanding Sample Class

Levene Statistics	*df1*	*df2*	*Sig.*	Conclusion
1,224	1	40	0.275	H_0accepted

Based on Table 11, the significance value is more than ∝= 0,05so it $H_0$is accepted and H_1rejected. This shows that the *Posttest* score data of the sample class concept understanding has a homogeneous variance at a significance level of 95%. Homogeneity test is used to find out the *Posttest data social awareness* of students in sample classes with homogeneous variance or not. Homogeneity test using *Levene-Test. Results of homogeneity test of Posttest* data *social awareness* as in Table 12.

Table 12. Results of *the Posttest* Score Data Homogeneity Test *Social Awareness* Sample Class

Levene Statistics	*df1*	*df2*	*Sig.*	Conclusion
0.421	1	40	0.520	H_0accepted

Based on Table 12, the significance value is more than ∝= 0,05so it $H_0$is accepted and H_1rejected. This shows that *the Posttest* score data *social awareness* of the sample class has a homogeneous variance at a significance level of 95%.

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The results of the homogeneity test show that the *posttest data* of the sample class concept understanding has homogeneous variance, therefore the test of the similarity of the two means was carried out by *the Independent Sample T-Test* assuming that both variances are homogeneous. The results of the test of the similarity of the two means of *the posttest data of the sample class* concept understanding are presented in Table 13.

Table 13. Results of the Test of Equality of Two *Posttest* Averages of Sample Class Concept Understanding

Pretest	**N**	**Average**	**Standard Deviation**	***Sig. (2-Tailed)***	**Conclusion**
Experimental Class	22	81.82	15.61	0.001	H_0 rejected
Control Class	20	66.08	11.18		

The results in Table 13 show that the significance value is less than $\propto$= 0,05so it $H_0$is rejected and H_1accepted. This shows that there is a difference between the average *posttest data of* the sample class concept understanding. at a significance level of 95%. The results of the homogeneity test show the *posttest data social awareness* sample class has homogeneous variance, therefore the test of equality of two means is carried out by *Independent Sample T- Test* with the assumption that both variances are homogeneous. The results of the test of equality of two means of *posttest data social awareness* sample classes are presented in Table 14.

Table 14. Results of the Equality Test of Two Means *of the Social Awareness Posttest* Sample Class

Pretest	**N**	**Average**	**Standard Deviation**	***Sig. (2-Tailed)***	**Conclusion**
Experimental Class	22	76.06	8.37	0.731	H_0 rejected
Control Class	20	76.92	7.59		

The results in Table 14 show that the significance value is more than 0 $\propto$= 0,05so it $H_0$is rejected and H_1accepted. This shows that there is a difference between the average *pretest data. social awareness* sample class at a significance level of 95%. The results of the *N-gain data analysis* of sample class students can be seen in Table 15.

Table 15. *N-Gain* Data Analysis of Sample Class Students

Statistical Size	**Increasing *Social Awareness***	
	Experimental Class	**Control Class**
Average N-Gain	0.4460	0.1788

Table 15 shows that the average *N-Gain* of conceptual understanding in the experimental class reached 0.4460, categorized as a "moderate" increase. On the other hand, the control class only achieved 0.1788. with the category of "low" improvement. These results indicate that the use of a contextual learning approach provides a higher increase in conceptual understanding compared to classes that use conventional learning. Considering the higher *posttest scores* for conceptual understanding and a more significant increase in conceptual understanding in the experimental class compared to the control class, it can be concluded that there is an effect of using a contextual learning approach on students' conceptual understanding . The results of the *N-gain* data analysis of sample class students can be seen in Table 16.

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Table 16. *N-Gain* Data Analysis of Sample Class Students

Statistical Size	Increasing *Social Awareness*	
	Experimental Class	**Control Class**
Average N-Gain	0.3527	0.0333

Table 16 shows that the average *N-Gain Social Awareness* in the experimental class reached 0.3527, categorized as a "moderate" increase. On the other hand, the control class only reached 0.0333 with a "low" increase category. These results indicate that the use of a contextual learning approach provides a higher increase *in social awareness compared to classes using conventional learning. By considering the posttest score* higher *social awareness and a* more significant increase *in social awareness in the experimental class compared to the control class, it can be concluded that* there is an influence of the use of a contextual learning approach on *social student awareness* .

The results of this study indicate that the use of contextual learning models has a significant effect on improving the understanding of science concepts and social awareness of elementary school students. The statistical findings confirm that students who were taught using the contextual learning approach demonstrated better learning outcomes compared to those who experienced conventional methods. This suggests that learning becomes more meaningful when students are actively involved in connecting the material with their real-life experiences.

These findings are consistent with previous research conducted by Andini and Suhartyaningsih (2025), which reported that the application of the Contextual Teaching and Learning (CTL) model significantly improved students' understanding of science concepts. This alignment strengthens the argument that contextual learning is an effective approach in science education, particularly at the elementary level. Furthermore, this study supports the theory of contextual learning, which emphasizes the importance of linking new knowledge to students' real-life contexts (Nababan and Sipayung, 2023). When students are able to relate abstract concepts to familiar situations, their comprehension becomes deeper and more sustainable.

In addition to improving conceptual understanding, this study also found that contextual learning enhances students' social awareness. This occurs because the learning process encourages students to observe, analyze, and respond to real social situations within their environment. This finding is in line with research by Alimuddin., et al. (2024), which showed that contextual learning can foster better environmental and social awareness among students. Therefore, contextual learning not only supports cognitive development but also contributes to the formation of students' social attitudes and values.

From a pedagogical perspective, the effectiveness of the contextual learning model can be explained by its student-centered nature. Unlike conventional methods that tend to be teacher-centered, contextual learning actively engages students in the learning process through discussion, collaboration, and problem-solving activities. This active involvement allows students to construct their own understanding, which is a key principle of constructivist learning theory. As a result, students are not only passive recipients of information but active participants in building knowledge.

Moreover, the absence of significant differences in pretest scores between the experimental and control groups indicates that both groups started from a relatively equal level of prior knowledge. Therefore, the improvement observed in the experimental group can be attributed primarily to the implementation of the contextual learning model. This strengthens the internal validity of the study and confirms that the treatment given had a real impact on students' learning outcomes. Overall, this study provides strong evidence that contextual learning can be an effective alternative approach to optimize students' understanding of science concepts and their social awareness. However, its successful implementation depends on careful instructional planning, appropriate learning design, and effective classroom management.

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CONCLUSIONS AND RECOMMENDATION

Based on the research results, the contextual learning approach has proven effective in improving elementary school students' understanding of science concepts and social awareness. The t-test results indicated a significant increase in the experimental group, which achieved an "intermediate" category in N-Gain, while the control group remained in the "low" category. These findings demonstrate that the contextual approach is more effective than conventional methods. Moreover, the absence of significant differences in pretest scores between the two groups suggests that the observed improvement was primarily due to the implementation of the contextual learning approach.

The findings of this study highlight the importance of incorporating contextual learning strategies in elementary education to enhance both cognitive understanding and social awareness. This approach supports meaningful learning by connecting academic content with real-life situations, thereby fostering deeper comprehension and student engagement. The results also reinforce constructivist learning theory, which emphasizes active student participation in the learning process.

It is recommended that schools adopt the contextual learning approach as an alternative instructional strategy. Teachers should carefully plan instructional design, learning stages, and time management to maximize learning outcomes. Future research should investigate the application of this approach across different subjects, grade levels, and educational contexts. Additionally, further studies are suggested to examine the long-term effects of contextual learning on students' academic performance and social development.

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