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THE EFFECT OF THE CONTEXTUAL TEACHING LEARNING (CTL) LEARNING MODEL ON THE MATHEMATICS LEARNING OUTCOMES OF GRADE III STUDENTS

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ABSTRAK

Dalam penelitian ini, pendidikan didefinisikan sebagai upaya yang dilakukan dengan kesadaran penuh dan perencanaan yang matang untuk menciptakan lingkungan belajar dan proses belajar-mengajar sehingga siswa dapat secara aktif mengembangkan potensi mereka. Tujuan dalam penelitian ini adalah untuk mengetahui pengaruh model pembelajaran Contextual Teaching and Learning (CTL) terhadap hasil belajar Matematika pada siswa kelas III di UPTD SD Negeri 122399 Pematangsiantar. Jenis penelitian yang digunakan dalam penelitian ini yaitu penelitian Kuantitatif. Desain penelitian yang akan digunakan yaitu Eksperimen, dengan bentuk Pre- experimental Design yang menggunakan desain "one group pretest- posttest design" dan sampel pada penelitian ini yaitu siswa kelas III di UPTD SD Negeri 122399 Pematangsiantar yang berjumlah 20 siswa. Instrumen yang digunakan dalam penelitian ini berupa test. Data diuji dengan menggunakan analisis dan berbantuan SPPS Versi 26. Hasil dari pengujian hipotesis penelitian yang terdapat pengaruh signifikan pada penelitian ini dan data yang sudah diujikan, dinyatakan dilihat dari analisis data yang diperoleh dari hasil rata-rata kelas eksperimen pada pretest (47,75) dan posttest (82,25). Hasil Penelitian di peroleh thitung ttabel (12,089>1,729) dengan taraf signifikan 0,05. Maka dapat disimpulkan bahwa model pembelajaran Contextual Teaching Learning (CTL) memiliki pengaruh terhadap hasil belajar Matematika pada siswa kelas III di UPTD SD Negeri 122399 pematangsiantar

Keywords:
Contextual Teaching Learning (CTL), Mathematics, Learning Results

ABSTRACT

In this study, education is defined as an effort carried out with full awareness and planning to create a learning environment and learning process so that students can actively develop their potential. The aim of this research is to determine the effect of the Talking Stick learning model on Mathematics learning outcomes in class V students at UPTD SD Negeri 122399 Pematangsiantar. The type of research used in this research is quantitative research. The research design that will be used is an experiment, in the form of Pre- experimental Design which uses a "one group pretest-posttest design" design and the sample in this research is class students at UPTD SD Negeri 122399 Pematangsiantar, totaling 20 students. The instrument used in this research is a test. The data was tested using analysis and assisted by SPPS Version 26. The results of research hypothesis testing which had a significant influence on this research and the data that had been tested, were stated to be seen from the analysis of data obtained from the average results of the

experimental class in the pretest (47,75) and posttest (82,25). Results The research obtained tcoun> ttable (12,089>1,729) with a significance level of 0.05. So it can be concluded that the Talking Stick learning model has an influence on Mathematics learning outcomes for class III students at UPTD SD Negeri 122399 Pematangsiantar

1. Introduction

Humans are creatures gifted by God Almighty with a form of reason. To cultivate this reason, an educational system is required through learning (Zulfa et al., 2020) . Education plays a crucial role in educating the nation, and every individual involved in it is required to contribute maximally and responsibly to the quality of education. Through education, intelligent and skilled generations can be produced, serving as a foundation for positive change, especially in today's era of global competition.

According to Law No. 20 of 2003, education is a planned basic effort to create a learning atmosphere and learning process so that students actively develop their potential for spiritual religious strength, self-control, personality, intelligence, morals, life sciences, general knowledge, and skills needed by themselves for society. According to Nurkholis (BAHRI, 2019), education is a process necessary to achieve balance and perfection in the development of individuals and society. The emphasis of education compared to teaching lies in the formation of awareness and personality of individuals or society in addition to the transfer of knowledge and skills. Education is a conscious effort to realize a cultural heritage from one generation to another. Education makes this generation a role model for the teachers of the previous generation. Until now, education has no limits to explain the meaning of education completely because of its complex nature such as its medium, namely humans (Kosassy et al., 2021) .

In this study, education is defined as an effort carried out with full awareness and planning to create a learning environment and learning process so that students can actively develop their potential. This aims to ensure that they have spiritual strength in religion, the ability to control themselves, good character, intelligence, noble morals, and the skills needed for themselves, society, nation, and state (Law No. 20 of 2003, Article 1 paragraph 1). Education is also a learning process that is passed down from generation to generation. Therefore, a teacher/educator has a very important role in the world of education, because with the help of teachers in implementing the learning process in the classroom, many variations must be carried out to make students interested in the Contextual Teaching and Learning (CTL) learning model (Taofek & Agustini, 2020) .

Education is one of the keys to the direction of Human Resource (HR) development, because education is necessary as a means to build superior and competitive human resources. Currently, Indonesia is striving to improve the quality of education to produce the next generation of the nation who are healthy, intelligent, adaptive, innovative, skilled,

and have character. According to Law Number 20 of 2003 concerning national education, Article 1 states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students are able to actively develop their potential to have spiritual religious strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, the nation, and the state (Lestari & Muchlis, 2021) .

The teaching and learning process is a crucial part of education, involving teachers as instructors and students as learners. In the learning process, teaching and learning activities have traditionally been more conventional, with teachers dominating the learning process and students passively participating. Teachers often use the lecture method, with students simply listening, resulting in students quickly becoming bored. According to Slameto (Takim, 2021), learning is considered successful when students are actively involved, physically, mentally, and socially, in the learning process. This active involvement is characterized by students' enthusiasm for learning and self-confidence during the learning process. One factor influencing student learning success is the role of the teacher. Teachers play a significant role in developing engaging and engaging learning models to encourage students' enthusiasm for participating in class and to effectively understand the material taught, thereby improving student learning outcomes. Learning outcomes can be used as the primary benchmark for determining student learning success, both in terms of behavioral changes and abilities in the learning process. These learning outcomes are measured by students' ability to master the subject matter after participating in class.

Achieving educational competencies is carried out through learning activities. One of the subjects that must be mastered at the elementary school/Islamic elementary school level is mathematics. Mathematics plays a crucial role in the development of science and technology and is an integral part of the educational curriculum. According to (Mazidah & Sartika, 2023) , mathematics is the science of quantity, shape, composition, and size. The main focus is on the methods and processes for finding appropriate concepts and symbols that consistently demonstrate the properties and relationships between quantity and size. Mathematics is one of the subjects.

Mathematics is a fundamental science needed by students to improve their logical and structured thinking skills, convey ideas, solve challenges in everyday life, and strengthen their reasoning, which is crucial for the advancement of science and technology (Silalahi et al., 2023) . The importance of mathematics in everyday life is due to the fact that mathematics is the foundation of education that is closely related to other disciplines. Therefore, it is very important to teach mathematics to students so that they can understand various mathematical concepts and be ready to face scientific advances. The process of learning mathematics is the transfer of knowledge from teachers to students that is designed in a way that involves logical thinking and processing, so that students can carry out learning activities in an effective and efficient manner (Andriani et al., 2021) .

The objective of mathematics learning according to Permendikbud No. 21 of 2016 concerning content standards is to help students develop a positive attitude towards mathematics, curiosity, enthusiasm for learning, self-confidence, and an interest in

mathematics. To improve the quality of education, it is necessary to improve the quality at the basic level, especially in the learning process in elementary schools. Because this stage is an important foundation for reaching the next level of education, just as a solid building has a good foundation that ensures the building is stable and safe.

Elementary education plays a crucial role in the development of students' knowledge, attitudes, and skills. Failure in elementary education can impact higher levels of education. According to Riadi & Edy (Hajerina, 2018) , low student mathematics learning outcomes are caused by many factors, such as a dense curriculum, ineffective learning media, inappropriate learning strategies and methods chosen by teachers, poor evaluation systems, teachers' inability to motivate students, or because the learning approach is still conventional, resulting in students' inactivity. Therefore, an engaging learning model is needed to enhance students' enthusiasm for learning and increase their participation in the learning process. A learning model is a component of learning that serves as a guide in carrying out activity steps. Trianto (Seri, 2019) states that a learning model is a framework that serves as a reference in designing and implementing the teaching and learning process. When implemented, a learning model includes approaches, strategies, methods, techniques, and tactics applied by educators to support the efficient achievement of learning objectives.

Based on the results of observations conducted by researchers in class III UPTD SD Negeri 122399 Pematangsiantar, there are still problems found in the learning process, especially in Mathematics learning for class III SD on the material of whole numbers up to 1,000, the number of students is 24 people, 15 girls and 9 boys. In the learning process, children are not encouraged to develop their thinking skills, thus making the lesson meaningless. This is because learning activities are still oriented towards textbooks so that they seem less interesting and boring for students. During learning activities, teachers only apply conventional methods, namely lecture methods, not applying varied methods. This causes students to cooperate less during the learning process. Student learning outcomes in mathematics learning are low, this can be seen from the results of student tests in mathematics lessons where most students get scores below the KKM.

Because there are still many students in mathematics subjects who are very low due to a lack of interest in learning and lack of motivation to learn, in connection with this problem, a model is needed to improve problems that are able to motivate students and condition students to participate actively both individually and in groups. In designing learning programs, Mathematics teachers must pay attention not only to mathematical aspects, but also to psychology (Suprayogi et al., 2019) . To overcome this problem, it is necessary to implement an appropriate and competent learning model so that students do not only follow learning activities monotonously, but students must also be involved and actively develop knowledge during learning. To achieve learning objectives, a learning model is needed, namely the contextual teaching and learning (CTL) learning model and teachers need to have teaching methods that can create a pleasant learning atmosphere for students. To achieve the expected learning objectives, teachers need to innovate in learning planning, the learning model that will be applied is expected to be able to make mathematics learning more meaningful and enjoyable, students become more active in the

learning process and students do not just memorize formulas and example questions or remember facts but students must experience what they are learning themselves.

The Contextual Teaching and Learning (CTL) learning model is a method that supports students in connecting lessons with real-life situations. Thus, students can realize the relationship between the knowledge learned in school and how it is applied in everyday life. CTL also emphasizes the importance of active student participation in the process of searching, processing, and discovering learning experiences directly through various real activities (Johnson, 2002: 116). In a previous study conducted by Diyanti (2019), the influence of the Contextual Teaching and Learning learning model on elementary school mathematics learning outcomes was observed. Some students experienced learning difficulties such as a lack of ability to understand the material and a lack of student activity in participating in the mathematics learning process, resulting in below-average student learning outcomes. The method used by previous researchers was an experiment. Data collection techniques used tests and documentation. The data obtained were hypothesis testing criteria and t-test results at significant rates.

In this study, the researcher presents two previous studies. In the first study conducted by (Rahmi Fitria et al., 2024) entitled The Effect of the Contextual Teaching and Learning (CTL) learning model, it was found that some students experienced difficulties in learning, such as a lack of ability to understand the material and a lack of active participation in the mathematics learning process. Thus, student learning outcomes were below average. The method applied by previous researchers was experimental. Data collection was carried out through tests and documentation. Based on the data obtained, using hypothesis testing criteria, the results of the t-test at a significance level of 0.05 showed that the t-value was greater than the t-table (5.367 > 1.6697). This means that the alternative hypothesis is accepted, so it can be concluded that there is an effect of the Contextual Teaching and Learning (CTL) learning model on students' mathematics learning outcomes in elementary schools.

In the second study conducted by (Setiawan, 2020:108-119) entitled "The Effect of the Contextual Teaching and Learning (CTL) Learning Model on Student Learning Outcomes in Sub Theme I Theme 2 of Class V of SD Negeri 1 Nusa Bakti". This study used experimental research. The design of this study was One-Shot Case Study. The population of this study was 198 fifth grade students of SD N 1 Nusa Bakti. The sample in this study was 20 fifth grade students. The sampling technique was carried out by cluster random sampling. The variables studied were the Contextual Teaching and Learning (X) learning model with learning outcomes (Y). The data collection methods used in the study were observation, documentation, and tests. Data analysis used normality tests and hypothesis tests. The results of the study showed that the percentage of the Contextual Teaching and Learning (CTL) model on fifth grade learning outcomes in the high category of learning 1 was 15.0%, the medium category was 75.0%, and the low category was 10.0%. The percentage of learning outcomes of fifth grade students in the experimental class of learning 1 is 80.20%. Hypothesis testing is carried out using the One Sample t Test, and a significance value (2-tailed) of 0.000 is obtained. Because the significance value is <0.05, Ho is rejected. While the t-count value of learning outcomes is 15,968> t-table, 2086l, so it can be concluded that Ho is rejected and Ha is accepted. The results of data analysis using a linear regression test show a significance value (2-tailed) of 0.000 <0.05. This means that Ho is rejected and Ha is accepted. Based on these data, it can be concluded that the Contextual Teaching and Learning (CTL) learning model has a significant influence on

student learning outcomes in mathematics material about flat shapes in fifth grade of SD Negeri 1 Nusa Bakti (Sri Utamaningsih, 2019) .

Based on several previous researchers above, it can be concluded that the Contextual Teaching and Learning (CTL) learning model can improve mathematics learning outcomes in elementary schools. The novelty of this research with previous research is that there is a research object conducted at the UPTD of State Elementary School 122399 Pematangsiantar with class III research subjects. The number of samples is 24 students.

Based on the background of the problem, the researcher is interested in conducting research with the title "The Effect of the Contextual Teaching and Learning (CTL) Learning Model on Mathematics Learning Outcomes of Class III Students of UPTD SD Negeri 122399 Pematangsiantar".

2. Method

The type of research used is quantitative research using experimental methods. According to Sugiyono (2023), quantitative research methods can be defined as research methods based on the philosophy of positivism, used to research specific populations or samples, data collection using research instruments, and quantitative/statistical data analysis, with the aim of testing predetermined hypotheses.

The research design used in this study was a pre-experimental design with one-group pretest-posttest design. This design includes a pretest before treatment and a posttest after treatment. This allows for more accurate results, as it allows for comparison with the pre-treatment situation (Sugiyono, 2023).

The research was conducted in class III of UPTD SD Negeri 122399 Jl. Mawar, West Siantar District, Pematangsiantar, UPTD SD Negeri 122399 Pematangsiantar is a school located in the middle of a residential area. The local class used by the researcher is class III. This research will be conducted at UPTD SD Negeri 12239 located at Jl. Mawar, West Siantar District, Pematangsiantar by the researcher in August of the odd semester of the 2025/2026 academic year.

According to Sugiyono (Harahap et al., 2021) , a population is a generalized area consisting of objects/subjects with certain quantities and characteristics determined by the researcher to be studied and then conclusions drawn. Based on this definition, this population is all third-grade students at SD Negeri 122399 Pematangsiantar, Jl. Mawar, totaling 20 people.

According to Sugiyono (Ahrisya et al., 2019) explains that a sample is a portion of the population and its characteristics. Therefore, the sample taken must be truly representative. Because the population in this study was less than 100 students, the sample used was the entire population, namely 20 students.

According to Sugiyono (2023), a variable can be defined as an attribute of a person or object that varies from one person to another or from one object to another. This study used two variables: the independent variable and the dependent variable. The following is an explanation of these two variables:

a. According to (Kartikasari, 2022) An independent variable is a variable that influences or causes changes in or the emergence of a dependent variable. The independent variable in this study is the Contextual Teaching and Learning (CTL) model.
b. The dependent variable is the variable that is influenced or the result of the independent variable. The dependent variable in this study is student learning outcomes in Mathematics.

According to Sugiyono Wulandari (2022) states that a research instrument is a tool used to measure observed natural or social phenomena. Specifically, all these phenomena are called research variables. This test was conducted to determine improvements in student learning outcomes, using a pretest and posttest before and after using the model. The test consisted of 25 multiple-choice questions. To determine the suitability of the test, the researcher used validity, reliability, discrimination, and difficulty levels.

3. Result and Discussion

This research is a pre-experimental (quantitative) research using a one group pretest and posttest design conducted in class IV of UPTD SD Negeri 125543 Pematangsiantar with a total of 25 students. The questions given during the research had been tested for validity first in class IV at a different school, namely UPT SD Negeri 081 Hutasoit II with a total of 25 students. After the validation of the questions was carried out, the research was continued in class IV UPTD SD Negeri 125543 Pematangsiantar on the Science subject with the material "Plants as a Source of Life", the first thing done in this research was giving a pretest to students in order to find out the results of student learning before the Realia media was carried out, then learning was carried out on the Science subject in the 2nd lesson using Realia learning media after the learning was carried out, then a posttest was carried out, the aim was to find out the results of student learning after being given treatment or after using Realia media (Lestari & Sumarno, 2025) .

Instrument Trial Results

The study conducted a trial of 35 questions on the instrument in class IV of UPT SD Negeri 081 Hutasoit II Jln. Prof. Dr. JH. Hutasoit, Lintongnihuta District, Humbang Hasundutan Regency, on August 25, 2025. 25 students were given the instrument trial. The trial was conducted to determine the validity and reliability as well as the level of difficulty and discrimination of the questions.

Validity is a measure that shows the levels of validity of an instrument. In testing the validity of the questions that had been completed by respondents, the researcher used the SPSS 26 application. After the researcher corrected the questions that had been worked on by the students, the researcher input the data into SPSS 26. The questions were said to be valid if the value of r_(calculated)> r_(table) with a significance level of 5% or 0.05%, and vice versa if r_(calculated)< r_(table) then the questions were said to be invalid (Prihandari et al., 2024) .

In determining r_ (calculate) it can be seen from the r product moment table with N = 25, then obtained = 0.3961.

Hypothesis

Hypothesis testing is a decision-making method based on data analysis. After considering the characteristics of the studied variables and the analysis statement, the next step is to test the hypothesis using SPSS 26. Based on the problem formulation and proposed hypothesis, a *paired sample test will be used* to answer the proposed hypothesis. The first hypothesis test uses a one-sample t-test. (Aulia et al., 2020) . This test was conducted to compare results within the same class (same sample), namely the pretest and posttest learning outcomes in the class using Realia media. It was used to determine whether there was a mean between the two paired samples. In SPSS 26, the basis for decision-making is as follows:

a. If sig (2-tailed) < 0.05, then there is a significant difference between the pretest and posttest scores.
b. If sig (2-tailed) > 0.05, then there is no significant difference between the pretest and posttest scores.

In this study, a sample test was used to determine the significant positive influence of Realia media on the science learning outcomes of fourth grade students, as can be seen in the following table:

Table 1. Hypothesis Test Results

Paired Samples Test

		Paired Differences							
					95% onfidence Interval f the Difference				
		Mean	Standard Deviation	Std. rror Iean	Low r	Upper	t	d	Sig. (2-tailed)
Pair	Before treatment After treatment	-3,00	14,649	2,93	-9,047	-6,953	-1,26	2	.000

Based on the table above, it is known that the sig value (2-tailed) is 0.00 and this value is smaller than 0.05, which indicates that there is a significant influence between student learning outcomes in the pretest and posttest. Therefore, it can be concluded that in this study, Ha is accepted and Ho is rejected, which means that there is an influence of Realia media on the science learning outcomes of fourth-grade students at UPTD SD Negeri 125543 Pematangsiantar. (Habaridota, 2022) .

Discussion of Research Results

This research was conducted in the fourth grade of the UPTD of SD Negeri 125543 Pematangsiantar in the academic year of 2025/2026. The population was 25 fourth grade students of SD Negeri 125543 Pematangsiantar. The sample size was 25 students. In this study, the researcher used a pre-experimental research type with a one-group pretest and posttest design.

This section will describe the results found in the research that has been carried out. The intended results are taken based on the collected data and data analysis carried out, this researcher aims to determine the Effect of Realia Media on Science Learning Outcomes of Grade IV Students of UPTD SD Negeri 125543 Pematangsiantar with a total of 25 people. Before conducting the research, the researcher first conducted an Instrument Trial at the same level with a different school conducted at UPT SD Negeri 081 Hutasoit. The test was carried out to determine the number of questions from 35 items that will be tested in the form of multiple choices, namely there are 20 items that are included in the valid category and 15 items that are not valid. The questions that are declared valid are 20 items which will later be used during the pretest and posttest in the research class. (Cahyaningrum et al., 2019) .

Based on the pretest results, the average value of student learning outcomes was 53.20 with the highest score being 85 and the lowest score being 35. Three students scored above the KKTP and 22 students scored below the KKTP. Looking at the existing percentages, it can be said that the level of student learning outcomes before using Realia Media was relatively low. (Hastuti, 2017) .

Furthermore, the average posttest score was 86.20, meaning that after using Realia Media, students had better learning outcomes compared to before using Realia Media. After the pretest and posttest normality tests were conducted, the hypothesis test was continued. The student test results obtained a sig (2-tailed) value of 0.00 <0.05, indicating that there was a significant difference between the pretest and posttest scores. In this case, Ho was rejected and Ha was accepted

4. Conclusion

Based on the research results and discussions that have been presented, it can be concluded that from the pretest results, the average value obtained is 53.20 which is classified as low. While the average value of student learning outcomes in the posttest is 86.20 which indicates that the results after being given treatment increased with a very large range. From the average pretest and posttest scores there is a difference of 33 and based on the data analysis of the pretest and posttest scores, it shows that the sig value (2-tailed) is 0.00 <0.05. Where Ho is rejected and Ha is accepted, meaning there is a significant difference between the learning outcomes of students who use Realia media which is more improved. So it can be concluded that there is an Effect of Realia Media on the Learning Outcomes of Grade IV Students of UPTD SD Negeri 125543 Pematangsiantar on the material of Plant Parts and Their Functions in the 2025/2026 Academic Year.

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