APPLICATION OF CONTEXTUAL TEACHING AND LEARNING MODELS TO THE CONCEPT OF SIMPLE FRACTIONS IN CLASS III SD STUDENTS

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INTRODUCTION

Mathematics is part of formal education that contributes to building quality resources. This is because mathematics is a core subject that must be followed by all students at all levels of education, from elementary school to college level. Optimal mathematics learning will produce humans who have the ability to think logically, analytically, systematically, critically and creatively. Mathematics learning will be obtained through the teaching and learning process in elementary schools. This teaching and learning process is the starting point for concept planting for students in understanding mathematics learning, especially the concept of simple fractions.

In the teaching and learning process in the classroom, cooperation between teachers and students is needed in order to achieve the expected learning objectives. K arena in the learning process is not only concerned with one component with the other components, but all the components will be synergized together into a step-effective strategy to realize the goals of the process of learning that takes place.

In the learning process in schools both the method and the model used is not yet fully optimized it appears on most students ries when learning takes place. The concentration of students who do not focus so that it affects mathematics learning outcomes is low because there is no emphasis on learning mathematics in the real world context. Mathematics learning is still around problems related to learning models. Therefore, in learning the material concept simple fraction election instructional model must be adapted to the material to be taught in order to create a learning environment that menyena n gkan.

Basically the third grade students of SD in obtaining information still some students have difficulty in me mahami concept simple fraction, for example, is still one of the reading and writing fractions. If reading and writing is wrong, of course, the understanding of the concept of fractions is still lacking. This situation can occur due to several factors, one of which is the application of a learning model that is not optimal. In addition, the activeness of students in the learning process also affects the planting of the concept of fractions. This has an impact on students' weakness in understanding the basic concepts of fractions so that it affects the low learning outcomes of students with the material to recognize simple fractions. Therefore, the effect of applying the learning model is one way to make students active and creative.

Referring to the problems mentioned , it is necessary to implement a model that could be interesting and fun for students to learn. One learning model that can be applied is the *Contextual Teaching and Learning* (CTL) learning model. In the application of the *Contextual Teaching and Learning* learning model*, you* can build your own understanding both in individual and group activities. so that in the end it can affect the learning outcomes of simple fractions. Especially about the meaning of fractions and how to recognize simple fractions.

The Nature of Simple Fractions

Understanding a Simple Fraction

The word fraction comes from the Latin *fractio* which means to break up into smaller parts or parts of a whole. Writing the fraction symbol includes 2 parts, namely the numerator and denominator separated by a straight line (-) and not a slash (/). Example, and so on, not 1/2, 2/3.
Simple fractions that students learn in elementary school, are part of a rational number that can be written in the form, a and b are integers and b is not equal to zero. A simple fraction is a number expressed in the form, with a and an integer, b ≠ 0, a is called the numerator and b the denominator (Subarinah, 2 006; 79).
Fractions are divided into several types of fractions. According to Supadi and Hastusi (2014: 69) Fractions can be divided into several types, namely as follows: ordinary fractions and mixed fractions.

1. Ordinary fraction
   An ordinary fraction is a fraction consisting of a numerator and denominator where the numerator is smaller than the denominator.
   Example: : $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{4}{5}$, and so on.
2. Mixed fraction
   A mixed number is a fraction that consists of whole numbers and fraction numbers.
   Example :

$$\frac{2+1}{2} = \frac{2}{2} + \frac{1}{2}$$

$$= \frac{3}{2} = 1\frac{1}{2}$$

Other examples are $2\frac{1}{5}$, $1\frac{7}{8}$, and soon.

Simple Fraction Concept

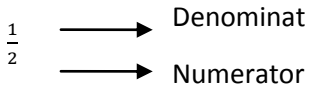
A fraction is a number that has a total of less or more than the whole consisting of a numerator and denominator. The numerator is the divisive number and the denominator is the divisor. According to Kennedy (1994: 425–427) says that fractions can arise from the following situations, one of which is a fraction as part of the same size as a whole . The activity of recognizing the concept of fractions will be more meaningful if the demonstration is preceded by story questions that use real or concrete objects , use fractional blocks and use an area .

1. Recognizing fractions

(a) Demonstration using concrete objects

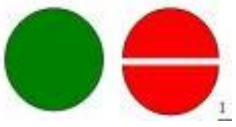
Today mother bought one watermelon at the market. One watermelon is divided into two pieces. Mother divides watermelons equally. Now mom has two equal pieces of watermelon.
pay attention to the picture!

If symbolized by the fraction of each piece of watermelon it is $\frac{1}{2}$.



The number 1 is called the numerator, which is the part value.
The number 2 is called the denominator, which is the overall value.

(b) Demonstration using fractional blocks



(c) Demonstration using the area

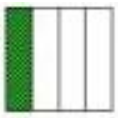
Shards can be demonstrated by folding the paper in a circle or square, so that the folds fit over each other. The folded part is opened and shaded as desired.


the shaded is 1/2


the shaded is 1/2


the shaded is 1/2

The demonstration above can be continued for fractions , and so on, as shown below.

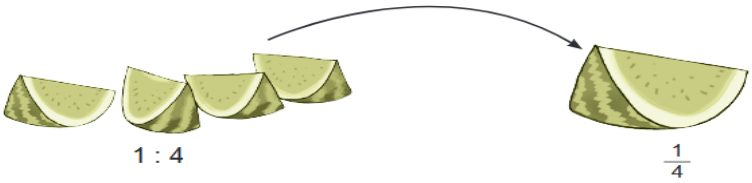

the shaded is 1/4


the shaded is 2/4


shaded is 2/8

Recognizing fractions $\frac{1}{4}$

(a) Demonstration using concrete objects

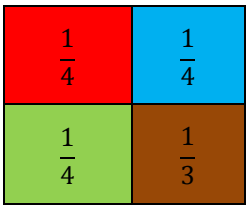


Father bought one watermelon. The watermelon is divided into four equal parts. The watermelons were given to Dodo, Mita, Kiki, and Desti.

Each part gets 1 part of 4 equal parts, so each part is called one fourth or one quarter .

(b) Demonstration using fractional blocks

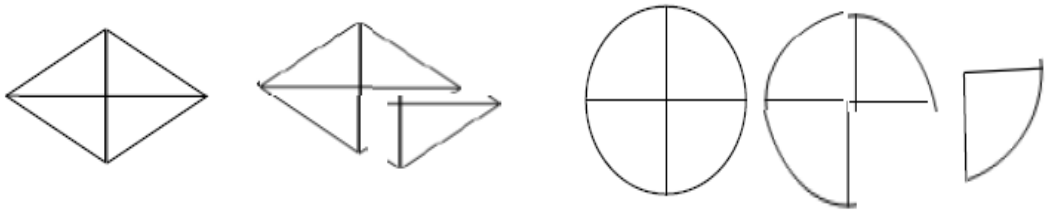
Dodi has a sheet of paper. He folds the paper into four equal sections. Then, Dodi colored the four parts of this paper with different colors, namely red, blue, green, and brown.



From this description, it can be seen that the part of the paper which is brown is “one of the same four parts of the paper. One of these four equal parts is worth "one fourth" or "one quarter".

(c) Demonstration using the area

Examples showing fractions $\frac{1}{4}$



1.Recognizing Fractions $\frac{1}{3}$ and $\frac{1}{6}$

(a) Demonstration using concrete objects

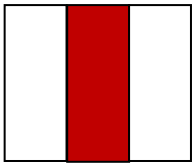
1 $\frac{1}{2}$ $\frac{1}{6}$

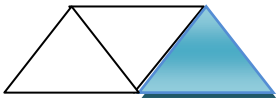
(b) Demonstration using fractional blocks

(c) Demonstration using the area

Janu is folding the paper into 3 equal pieces.
One section of the paper is colored red. Red colored paper worth one third of the paper.

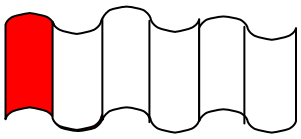
Examples showing fractions $\frac{1}{3}$



The blue area is 1/3 of the total image	The rian pencil has used 1/3 of the full pencil
	

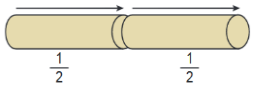
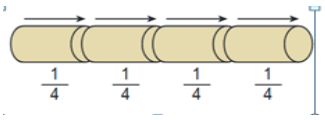
A rectangle divided by six equals. The value of one shaded part is one-sixth or 1/6. The value of each of the other pieces is also 1/6.

Examples showing fractions $\frac{1}{6}$

Each slice of cake is 1/6 of the total cake	The area in red is 1/6 of the total image
	

Read and Write the Symbol of Fractions.

1 . Reading Fractions

Rudi has a wooden stick. The stick was then cut in half. Then the value of each piece is half or half. 	 $\frac{1}{2}$ → Read one → Read per → Read two So, 1/2 is read as halt	 $\frac{1}{4}$ → Read one → Read per → Reads four So, 1/4 is read as a quarter

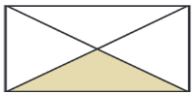
2. Write Fractions

Dad has a rectangle. The rectangle is divided into two equal parts. The shaded portion indicates one divided by two (1: 2). One divided by two is written as a fraction as a half. The fraction is written in half $\frac{1}{2}$.

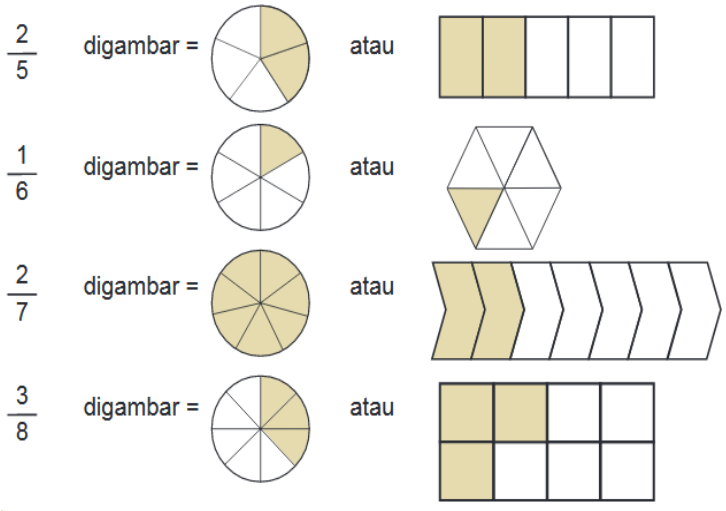
$\frac{1}{2}$ → Denominat
→ Numerator

3. Present Fraction Value

Iwan has a sheet of paper. The paper is cut into 4 equal parts. How much is each part worth? The value of each part is 1: 4 or $\frac{1}{4}$.



How to present other fractions, consider the following picture:



The Nature of Contextual Teaching and Learning (CTL) ModelUnderstanding Learning Model

The learning model is a general pattern of learning behavior to achieve the expected learning objectives. Choosing a learning model must be adapted to the reality and situation of the existing class, as well as the view of life that will result from the process of cooperation between teachers and students. According to Hamzah and Muhlisrarini (2014: 154) the learning model is a systematically structured learning framework that is used by the teacher as a reference to determine the achievement of learning objectives.

While Joyce and Weil found m odel learning is a plan or pattern that can be used to shape the curriculum (long-term learning plan), designing learning materials, and guiding in-class or another "(Rusman, 2013: 133)

Based on the opinions of the two experts above, it can be concluded that the learning model is a teacher's guide or guide that is a reference for carrying out the learning process starting from lesson planning, compiling teaching materials and controlling the classroom.

Understanding Contextual Teaching and Learning (CTL) Model

The *Contextual Teaching and Learning* model is one of the models included in the learning implementation plan. This model links each learning material or topic with real life. According to Suprijono (2011: 79), Contextual Teaching and Learning is a concept used by teachers in the learning process and connects it with the real world according to students' daily lives.

Meanwhile, according to Rusman (2013: 190) argues that *Contextual Teaching and Learning is* a learning model that provides facilities for student learning activities to seek, process, and find learning experiences that are more concrete (related to real life) through the involvement of student activities in trying. , do and experience for yourself.

Based on the above opinion, it can be concluded that *Contextual Teaching and Learning* is a concept that links the material being taught with real-world situations so that students can understand the material according to their own understanding.

Contextual Teaching and Learning aims to help students see meaning in the material they are studying with the content of everyday life. Thus learning will be more meaningful, the school is closer to the community environment so that what is learned in school is always in touch with the situations and problems of life that occur in their environment.

Learning Principles of Contextual Teaching and Learning

Rusman (2013: 193-198) there are seven principles of *Contextual Teaching and learning* that teachers must develop, namely constructivism, questioning, inquiry, learning community, modeling, reflection (reflection) and actual assessment (authentic assessment).

The explanation of each of the components above includes the following:

1. Constructivism (Constructivism)
   Constructivism is the foundation of philosophical thinking in *Contextual Teaching and Learning* (CTL), namely that knowledge is built by humans little by little whose results are extended through a limited context. Knowledge is not a set of facts, concepts or rules that are ready to be picked up and remembered. Humans must construct that knowledge and give meaning through real knowledge.
2. Find (Inquiry)
   Finding is a core part of contextual-based learning activities. Knowledge and skills acquired by students are expected not the result of remembering a set of facts, but the result of finding themselves. For that the teacher must design to find learning material.
3. Asking (Questioning)
   Asking is the main strategy in context. Asking questions in learning activities is seen as a teacher activity to encourage, guide and assess students' thinking abilities.
4. Learning community (Learning Community)
   The learning community is to familiarize students with collaborating and utilizing learning resources from their fellow students.
5. Modeling (Modeling)
   Modeling in contextual learning is that learning is related to knowledge or model skills that are usually imitated by students. This modeling can be related to how to do or do something. In this approach the teacher is not the only source of learning. Learning resources can be found inside and outside the classroom depending on the material required.
6. Reflection
   Reflection is a way of thinking about what has just been learned or thinking backward about what was done in the past. Students rely on what has just been learned as a new knowledge structure, which is an enrichment or revision of previous knowledge. Thus this reflection is a response to whatever has just been received.
7. Authentic Assessment
   Assessment is the process of collecting various data and information that can provide an overview or clue to student learning experiences. This description of learning development needs to be known by the teacher in order to ensure that students have experienced the learning process correctly.

Based on the description above, it can be concluded that contextual learning is a learning strategy that is considered appropriate because the material taught by the teacher is always related to

the daily life of students. By using contextual learning, the material presented by the teacher will be more meaningful. Students will be more active and form a relationship between knowledge and apply it in students' daily lives.

The advantages of Contextual Teacing and Learning

According to Johnson (2009) the advantages of *Contextual Teacing and Learning* (CTL) are as follows:

1. Learning becomes more meaningful when students are required to know the relationship between real life and learning experiences at school. This is very important, because by being able to relate material that can be found in real life. So the lessons taught will not be erased easily but are firmly embedded in students' memories.
2. Able to strengthen conceptual understanding to students and more productive learning, because contextual learning adheres to the flow of constructivism. Where students are required to find their own knowledge. Students are expected to learn through "experiencing" not "memorizing".

Deficiency Contextual Teacing and Learning

According to Johnson (2009), he explains the weaknesses of Contextual Teacing and Learning (CTL) as follows:

1. Teachers are more intensive in guiding students. The teacher's role is no longer as information. But the teacher's job is to manage the class so that students together as a team discover new skills and knowledge for students. The developing individual is a view for students. The ability to learn can be influenced by the amount of experience and development they have. Therefore the role of a teacher is only as a guide, so that students can learn according to their development stage.
2. Teachers must provide opportunities for students to apply and invite students to use their own strategies to learn or find their own ideas. But in this condition the teacher should provide more guidance and attention to students so that the objectives of the teaching and learning process are in accordance with what was originally expected .

RESEARCH METHODS

The research was conducted at SDN 11 Limboto district of Gorontalo, with s ubjek this study are all students to weld III of 20 people . In this study, the researcher used a quantitative descriptive research method with *pre-experimental* methods (non - designs) with a *one-group prittest-postest design*. This design can be described as follows:

O_1	X	O_2

Information:

O_1 = *pritest* value (before being given treatment)

O_2 = *posttest* value (after being given treatment)

X = Model Contextual Teaching and Learning (Treatment)

The variable in this study, namely the X variable or the independent variable (independent variable), is the *Contextual Teaching and Learning* Model and the Y variable or the dependent variable (dependent variable) is the student learning outcomes . The population in this study were all third grade students at SDN 11 Limboto, Gororntalo district with a total of 20 students

The sample is part of the number and characteristics of the population. For this reason, the sample taken from the population must be truly representative (Sugiyono, 2016: 118). With the sampling technique used was *saturated sampling* . So the sample in this study were all students of class III, amounting to 20 people .

The technique of collecting data is observation by researchers, namely observation during the learning process. Tests used in the researcher 's this is achievement test , t Objective her to determine the level of student understanding tent ang material that has been taught . Documents are data b erupa lesson plans, student attendance, number of students, as well as taking pictures or photographs to strengthen the evidence about the conduct of the study.

Technique of data analysis that u ji Instruments , normality test data and test hypotheses test instrument in the form of testing the validity of tests and test reliability of the test. The test value of the test uses the *baserial point* correlation formula as follows:

$$r_{pbis} = \frac{Mp - Mt}{sdt} . \frac{\sqrt{p}}{q}$$

(Awalludin, 2009)

Information:

pbis = baserial point correlation coefficient
M_p = the calculated average score for the correctly answered items.
M_t = average score of the total score.
SD_t = standard deviation of the total score
p = proportion of students who answered correctly
q = proportion of students who answered incorrectly.

The reliability test uses the Alpha Cronbach formula with the test criteria if the Cronbach Alpha is 0.6 then the instrument is reliability. The formula is

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum S_i^2}{S_t^2}\right)$$ Information: r_{11} = instrument reliability

K = valid items

$\sum S_i^2$ = amount of grain variance

S_t^2 = total variance

$$r_{11} = [\frac{k}{k-1})$$

After obtaining the reliability figure, the next step is to consult the figure with the r value interpretation table as follows:

Table 3.2 Cronbach Alpha Testing Criteria as follows

Score	Information
0.01-0.20	Very low
0.21 - 0.40	Low
0.41 - 0.70	Moderate
0.71 - 0.90	High
0.91 - 1.00	Very high

Based on these calculations, the reliability value of the test instrument was obtained at 0.940. This value is a very high criterion. Therefore, it can be concluded that this instrument is suitable for use in research.

Data Normality Test

The normality test is used to determine whether the distribution of the data obtained comes from a normally distributed population or not. This study aims to determine whether the data obtained from the research results are normal distribution or not. The normality test uses the Lillefors test (Sudjana, 2005 446) as follows:

1.Observations $x_1, x_2, \ldots .. x_n$ are used as standard $z_1, z_2, \ldots, z_n$ using the formula $z_i = \frac{x_1 - \bar{x}}{s}$

Where $\bar{x}$ = sample average is obtained using the formula $\bar{x} = \frac{\sum x_1}{n}$

S = standard deviation obtained by the formula $s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$

2. For each of these standard numbers and using the standard normal distribution list, the probability of $F(z_i) = P(z \leq z_i)$ is calculated .
3. Next, the proportion of $z_1, z_2 \ldots\ldots, z_n$ is calculated which is smaller or equal to z_i . if this proportion is given by $S(z_i)$, then

$$S(z_i) = \frac{\text{the number of zi,z2,... zn that is} \leq \text{zi}}{n}$$

4. Calculate the difference between $F(z_i) - S(z_i)$ then determine the absolute price
5. Take the biggest price between the absolute prices of the difference which is called Lo. The hypothesis being tested is

H_o = data on the test scores of the students' prettes and posttests were not normally distributed
H_a = test score data for students' prettes and posttests with normal distribution

The test criterion is accept $_{Ho}$ if Lo ≤ L $_{table}$ in other circumstances rejected $_{Ho}$ at the significant level α = 5%.

The following are the results of the data normality test calculations obtained from statistical analysis in the table:

Table 3.3. Normality Test Results

Ability	L $_{count}$	L $_{table}$	Conclusion
Pretest	0.1009	0.190	Normal distribution
Posttest	0.0 890	0.190	Normal distribution

Hypothesis testing

To test the hypothesis, this research was carried out through the following steps:

1). The hypothesis is converted into pairs of statistical hypotheses

Ha: 0 there is an effect of the application of the *Contextual Teaching and Learning* model on the learning outcomes of the learning material for recognizing simple fractions in class III SDN 11 Limboto, Gorontalo District

Ho : = 0, there is no effect of the application of the *Contextual Teaching and Learning* model on the learning outcomes of learning material to recognize simple fractions in class III SDN 11 Limboto, Gorontalo District

2). The hypothesis is tested by the formula:

$$Uji\ t\ = \frac{\overline{X2} - \overline{X1}}{\overline{SD}}$$

Information:

$\overline{X1}\ = mean\ kelompok\ 1$

$\overline{X2}\ = mean\ kelompok\ 2$

SD = standard error of influence sampling distribution

Where SD is calculated by the formula:

$$SD = \sqrt{\frac{\sum D^2\ - \sum D^2\ /np}{np - 1}}$$

Information :

SD = standard deviation

D = differsences

np = n population

1 = constant value

Then calculated by the formula:

$$\overline{SD}\ = \sqrt{\frac{SD}{np}}$$

3). Testing Criteria

The test criterion is accept H $_{a}$ if t $_{count}$ > t $_{table}$, in other circumstances H $_{a\ is}$ rejected and accepts H $_{o}$ at the significant level α = 5% and db = n-1.

Research Results and Discussion

This research was conducted at SDN 11 Limboto, Gorontalo District. The population in the study were all students in class III SDN 11 Limboto and the samples in this study were 20 grade III students of SDN 11 Limboto, amounting to 20 people with 9 women and 11 men, where the research will be carried out using the experimental design of the *Pre* form. - *Experimental design*. The form of *pre-experimental* research *design* contains one form of research design, namely *one group pretest*

postest design. The technique used is to collect research data through test techniques. The test is given in two stages. The problem under study is whether there is an effect of the application of the contextual teaching and learning model on the learning outcomes of the material to recognize simple fractions in grade III SDN 11 Limboto?

The initial stage in this research is to prepare learning tools and research instruments used to collect data in the form of observation, tests (can be seen in the attachment), and documentation. Before being used in the class to be studied, the researcher first conducts a validity test which aims to determine whether the learning device is suitable for use or not. The validity of the test was carried out in class III SDN 22 Dungingi and validated by the researchers themselves using Microsoft Excel with items in the form of multiple choice or objective.

The results of the validation using Microsoft Excel with the biserial point correlation formula (Rpbis), prove that of the 25 question numbers only 13 are valid. After validating the reliability results with a reliable coefficient of r = 0.940 this value is a very high criterion. Therefore, this instrument is suitable for use in research.

At the time of the research, the researcher made observations of the teacher and student activities for 2 days. After the observation, the researcher continued the research by giving tests to the third grade students of SDN 11 Limboto. As a *pretest* , the students worked on questions about the material to recognize simple fractions given by the researcher. The next day the researcher taught the material on recognizing simple fractions using the *contextual teaching and learning* model . After the learning is complete, the researcher gives a final test *(posttest)* .

The data obtained through this study were in the form of pre-test and post-test values using the results of the pre-test and post-test values. It can be seen that the results of the data are normally distributed. The sample used in the study came from students of class III SDN 11 Limboto, totaling 20 students.

Based on the results of data analysis that has been carried out using tests, it is explained that there is an increase in learning outcomes of class III students of SDN 11 Limboto. Based on the results of the research data analysis, it can be seen that the average student learning outcome before using the *contextual teaching and learning* (pre test) model is 49.3 so that this result is lower than after using the *contextual teaching and learning* (post test) model which is 78.95 . The difference between the pretest and posttest mean scores is caused by the treatment, namely the use of the *Contextual Teaching and Learning* model which provides opportunities for students to develop thinking skills by seeking and finding concrete learning experiences.

As has been explained by Suprijono (2011: 79) that Contextual Teaching and Learning is "a concept that is used by teachers in the learning process and connects it with the real world according to students' daily lives." Meanwhile, according to Rusman (2013: 190) Learning *Contextual Teaching and Learning* as "a learning model that provides facilities for student learning activities to seek, process, and find learning experiences that are more concrete (related to real life) through the involvement of student activities in trying, do and experience for yourself ". Basically, this model is an effective way to get students actively involved in the learning process . With this model students are trained to express opinions and respect the opinions of others while still referring to the material or learning objectives.

Based on the results of the analysis of the dependent t test, the results obtained arithmetic t_{count} 67 286 and $t_{table,}$ 2093 at significance level of 5% if $t_{arithmetic}$ greater than t_{table} then Ha Ho accepted and rejected.

Based on the results of the hypothesis test, it is concluded that there is an effect of the application of the *contextual teaching and learning* model on the learning outcomes of the material to recognize simple fractions in grade III SDN 11 Limboto, Gorontalo District.

Conclusions and suggestions

Based on the results of research and discussion, at the conclusion that the application of the *Contextual Teaching And Learning* of the material to know simple fraction in Class III SD worked well because the students learn while playing means that students not only learn in the classroom, but students can also learn outside the classroom, in addition to That with the application of this model can foster student enthusiasm for learning .

As a suggestion to apply right model of *Contextual Teaching And Learning* on familiar material simple fraction of this should students ask the teacher if there is a material that is not understood, dare mengutara ka n ideas to friends of other students, as well as learn from the experiences of day-to day. G uru expected to use appropriate instructional model in each of the next lesson so that students are more active and happy in learning matem atika . S ekolah should be able to provide advice facilities a and infrastructure related to the learning process . For other researchers , this research can be used as a reference for further research in applying the *Contextual Teaching And Learning* model to other learning materials.

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