Comparison Analysis of the RME and Conventional Learning Model on Multiplication Material in The 2nd Grade of MI Ma'arif NU 1 Pageraji Using Software Aplication R

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Abstract. The Mathematic objects are considered difficult by the 2nd grade of MI Ma'arif NU 1 Pageraji students. That things may be the mathematic objects are taught by conventional method, so that they become no easy. However, they can easily to be understood if the learning is associated with the student's real life. One of the methods that can be applied is RME learning model to facilitated the students. RME has six principles are: Activity (Doing) Constructivist, Reality (meaningful application-process), Understanding (find informal in context through reflection, informal to formal), Inter-twinment (interconnection between concepts), Interaction (learning as social activity, sharing), and Guidance (from teachers in discovery). RME is suitable for the 2nd grade elementary school students, because of students are still in concrete phase, so that, students will understand the material being taught more easily.
This paper presents about the comparison of Conventional Learning Model (Lecture Model) with RME, which will be tested on multiplication materials in MI Ma'arif NU 1 Pageraji, Banyumas, and the results will be analyzed with using Software Application R.

1. Introduction

Acording to the statement of Marpaung (2003), Teaching of teacher paradigm can't be defensed into mathematic learning program in school again. It can be replaced by studying paradigm. Students can be occupied of it. Knowledge isn't a pure material, but it is a process that students should be practiced, be thought, and be constructed. And, it can't be transferred who receive it passively.

The special one of learning method that appropriate with the studying paradigm while students have their potential to study and grow up by their active quest and the developing of knowledge is RME (*Realistic Mathematic Education*).

RME is a mathematic learning for students to transform any problems into symbol mathematic and the problem solving in their daily activities also. RME is referred by Freudenthal statement about mathematic must be linked with the reality and mathematic is an activity. It means, mathematic must be closer with students and relevant in the real life.

RME afford to make students more active and teachers are to be facilitator, motivator, and class organizer that create an excited studying situation. Beside that, the application of RME do hoped can be easier to do and students can more understand to increase their capabilities about the comprehension of mathematic concept in Indonesia.

The principles of RME are doing, constructivist, reality (process-application), comprehension (finding the context by the reflection informally, informal to formal), Inter-twinment *(*interconnection between the concepts), interaction (learning is a social activities, sharing*),* and guidance (teacher from discovery). (Ngalimun, 2014:163).

Many students haven't understand about multiplication concept correctly, such as a problem in the class 2nd grade of MI Ma'arif NU 1 Pageraji. Probably, it is because the model of teaching learning is unsuitable to apply in the class. Mainly, the model from active teacher and students just to be object.

Pre Test and *Post-Test* instruments are given to measure in this research. Observe and analyze the students answer by using software application R, before and after we explain the concrete material about the exact multiplication concept. Appropriate with the kind of research methods, technique of analyzing data by using quantitative analyzes technique (descriptive statistic). Software application R (R Development Core Team, 2009) is one of the fame software open source with "lingua franca" or "standard language" of statistic computation in this moment.

2. THEORY ANVIL

2.1. Comprehension of Mathematic Concept

Concept comprehension is a qualification or an accomplishment of mathematic that do hope can be achieved in mathematic learning by showing the concept mathematic comprehension students that has been learned, explain the relation between the concepts and apply it accurately, efficiently, flexibly, and exactly by problem solving of it. (Depdiknas, 2003:2).

According to NCTM (2008:61), to achieve the sense of their comprehension, mathematic learning must be directed to the developing of mathematic connection capabilities among the ideas, understand about how to relate each other's, until the comprehension could be risen spread all over, and the outer side context of mathematic also.

2.2. RME and Conventional Learning Model
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2.2.2. Conventional Learning Model

Conventional learning model is a communicative model that demands teacher to teach the material and students are audience. It is effective to solve the rare references and suitable for students understanding.

The surpluses from this method, teacher are easier to authorize the class, explain many materials, joined by many students, and minimize the deficiency of books reference.

2.3. *Pre Test* and *Post Test* as The Success Measuring Instrument of Learning Model

Pre test is a part of activity to examine student knowledge level with the material that will extend it. *Pre Test* will be did before opening the lesson. *Pre Test* is used to know about the first student ability about the material topic.

Post Test is a kind of question that will be given after receiving the material from the teacher. *Post Test* is the one of finish evaluation about the new material which the teacher give it to measure the student comprehension.

Pre Test and *Post Test* can reach the conclusion about, is the RME learning model can increase the multiplication concept comprehension.

2.4. Software Application R

Software application R (R Development Core Team, 2009) is one of famous open source software and to be the "lingua franca" or "standard language" to the daily statistic computation now.

Functions and the ability of R is gotten from Add-on packages/library. Library is collection of commands that is used to analysis something (resemble with Toolbox in MATLAB). Standard installation from R consist of several basic library are stats, graphics, utils, datasets and base. Out of it, there are several library of the contribution result from R users.

3. OUTPUT AND CRITISM

The ability of students cognitive will be developed, if students often be given any problems that happen in their life. Human capabilities is not same with mental expansion rhythm and it is limit. So, teacher must adjust the extending of lesson for them, such as studying from abstract object into concrete object in multiplication operation system learning. Students is invited to finish the problem from their experience in their life.

Warm opening is needed to open the program before giving *Pre-Test* paper. Students answer the questions very enthusiastic. Do hope, it can construct their comprehension about recurring sum operation of multiplication operation system exactly.

After doing *Pre-Test,* students are given the simple explanation about 3 x 2 is different with 2 x 3. This happen because our activities, by the example between boxes and balls. Situation 1 : 3 x 2, there are 3 (three) boxes and there are 2 (two) balls inside each box. Meanwhile, situation 2 : 2 x 3, there are 2 (two) boxes and there are 3 (three) balls inside each box. From this explanation, students can understand the multiplication concept well, mainly *" if 2 x 3 is 3 + 3, is not 2 + 2 + 2".*

Checking for student understanding, new question are given for them, and appoint one of them to answer the question by the last media. After finish their questions, students are suspected they have understood about the true concept. And *Post Test* papers are given to them also.
Surpluses of using RME learning model for multiplication concept in MI Ma'arif NU 1 Pageraji, Cilongok, Banyumas are :
a. Students get the point of abstract context and easier to understand the material.
b. Students can solve the mathematic problems.

Purpose of RME learning model in MI Ma'arif NU 1 Pageraji, Cilongok, Banyumas are :
a. Increase their mathematic concept comprehension.
b. Students can create new innovation and be creative students.
c. Good communication and nice feedback.

There are two classes in this research, RME class and conventional class. And there are two parts of test, *Pre-Test* and *Post-Test* also.

The average value of *Pre Test* in RME class is 46,67 by predicate D. It means, students still haven't understand yet about the multiplication concept. But, the average value of *Post Test* in RME class is 75,18 with predicate A, indicate the rising of student comprehension about it.

The average value of *Pre Test* in conventional class is 44,81 by predicate D. It means, students still haven't understand yet about the multiplication concept. But, the average value of *Post Test* in RME class is 73,33 with predicate B, indicate the rising of student comprehension about it.

The prerequisite experiments are normality and hypothesis experiments. So, *Test of Normality* output from *Pre-Test* data both of the classes, the significance value of RME class is 0,096 and conventional class is 0,091. Because of, those significance value > 0,05 and it is normal distribution.

Meanwhile, *Test of Normality* output from *Post-Test* data both of the classes, the significance value of RME class is 0,108 and conventional class is 0,071. Because of, those significance value > 0,05 and it is normal distribution also.

The *Post Test* result is analyzed by using T-test independent experiment by software application R. Here is the output :

Picture 1. Output of Software Application R

```
        Two Sample t-test

data:  Nilai by Model
t = -0.533, df = 52, p-value = 0.7018
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
 -7.670362        Inf
sample estimates:
mean in group Model Konvensional          mean in group Model RME
                  73.33333                            75.18519
```

From the result, can be analyzed that :

a. Hypothesis

$H_0 : \mu_{RME} = \mu_{Conventional}$

$H_1 : \mu_{RME} \neq \mu_{Conventional}$

b. Decision Interpretation Base

By using p-value are :

If p-value > 0.05, H_0 is received.

If p-value < 0.05, H_0 is rejected.

c. Decision

P-value from the output of software application R is 0.7018, because of p-value > 0,05, H_0 is received.

4. CONCLUSION AND PROPOSITION

4.1. Conclusion

The RME learning model, games and some simulations are needed for the 2nd grade of MI to develop their critical attitude and scientific about the numeral that is mentioned from the questions by describing the sum operation continuously with the things in their environment. Meanwhile, from conventional learning, teachers have many times to teach their students, although, they have no books references. But, both of these learning model are suitable to build students comprehension about multiplication concept.

From the analysis result by using software application R above, using RME and Conventional learning model there are no difference to increase the students of 2nd grade of MI Ma'arif NU 1 Pageraji about the material of multiplication concept.

The deficiencies of multiplication by RME learning model are numeral minimal and limited media to practice in the class. Meanwhile, the Conventional learning model, teacher is difficult to make students understand, because no using media.This is the paragraph spacing that occurs when you use the [ENTER] key.

4.2. Proposition

Do hope all reader can using RME learning model and/or Conventional learning model that is appropriate with students' condition about teaching and studying mathematic lesson in multiplication material to increase their understanding about it. For the next research, giving more than two numerals excitedly by usung creative media and build the students' comprehension.

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