THE DEVELOPMENT OF MODELING THE WAY LEARNING SRATEGY IN FACE – TO – FACE TUTORIALS ON MATHEMATICS LEARNING COURSE OF PRIMARY SCHOOL.

Sondang Purnamasari Pakpahan (sondangp@ecampus.ut.ac.id)

Abstract

The purposes of this research are, (1) to identify the effectiveness of using active learning strategy modeling the way in improving the interest of tutorial learning, (2) to identify the effectiveness of using active learning strategy modeling the way in improving the ability of students in transferring their knowledge during tutorial class, (3) to identify the effectiveness of using active learning strategy modeling the way in giving good result in mathematic learning course for primary school. This research was conducted by using experiment research with randomized post test control group design on two sample groups, the experiment group and the control group of tutorial class students, and the experiment group and the control group of primary school student. The results of the research showed the average scores of student in tutorial class that used learning strategy modeling the way is better than the class of student using conventional method. Similarly, the outcomes of the primary school student learning that taught by student from tutorial class experiment is better than the outcome of the primary school student that taught by student from tutorial class control. The hypothesis experiment showed the differentiation of the learning result is significant at $\alpha = 0,05$. The results also indicated positive response from student, that is the lecturing process with learning strategy modeling the way is interesting, very useful for understanding the course and make students more confident in delivering material to their students. It is recommended that the tutor of mathematics learning course for primary school uses the learning strategy of modeling the way in face-to-face tutorial.

Keywords : Modeling The Way, Mathematics Learning in Primary School, Learning Strategy.

Introduction

In distance learning Universitas Terbuka conduct face-to-face Tutorials to help students understand modules that have been studied independently. But sometimes the implementation of this tutorial can not run maximum because of the limited time available and many lesson materials that must be understood. As in the Mathematics Learning Course of Primary School. In this course, students are not only required to understand the materials contained in the Instructional Materials, but the important thing is the student should be able must be able to deliver the material obtained to primary students at school. With the condition of the tutorial time is limited, then a tutor required to be able to guide the course. well. But from the results of research surveys in the location of the tutorial, many tutors who only use conventional tutorial methods in the tutorial activities. The method used are generally lecture, brainstorming the idea and group discussions. Whereas as mentioned previously in addition to understand the material, this course requires students to be able to convey the contents of learning materials to students at school / class where he duties. Based on it, this research tries to develop *active learning strategy of modeling the way type* in tutorial activity at Mathematics Learning Course of Primary School. The purpose of this research are (1) to identify the effectiveness of using active learning strategy modeling the way in improving the interest of tutorial learning, (2) to identify the effectiveness of using active learning strategy modeling the way in improving the ability of students in transferring their knowledge during tutorial class, (3) to identify the effectiveness of using active learning strategy modeling the way in giving good result in mathematic learning course for primary school.

Theoritical review

According to Ginting (2008) tutorial method was very suitable to be applied in self-learning model as in distance learning where students were first given the module to be studied. Advantages of tutorial methods: (1) Students obtain individual learning services so that specific problems which they face can be served specifically as well, (2) A student could work with speeds appropriate to his or her own ability without having to be influenced by the speed of learning of other students. While the weakness of the Tutorial Method are : (1) It is difficult to implement classical learning because the tutor must serve the students in large number, (2) If it was still implemented, it is necessary to use "team teaching" with the division of task among team members, (3) If the tutorial was implemented to serve the students in large number, it is necessary appropriate learning strategies. The Steps of

Learning Tutorial Methods include : (1) Planning Steps that include studying the module and identifying the difficult parts and developing learning strategies, (2) Preparation steps consist of preparing additional teaching materials and preparing simple questions as a bridge for solving difficult problems, (3) Implementation steps include identifying students who are facing difficulties in understanding the modules that have been given and the parts that are understood and implement the tutorials (4) The Evaluation and Closing Step consist of conducting Questioning activities to ensure that the student has overcome the learning difficulties and to understand the learning materials being studied and to provide independent tasks, including studying additional tasks with the aim of establishing and broadening students' understanding of the material being studied

According to Jhon Holt (in Silberman, 2005) stated that learning is better if students were asked to do the following: (a) Students delivered information in their own language, (b) Students gave examples, (c) knowing it in different circumstances, (d) Knowing the relationship between facts or ideas with others, (e) Using them in various ways, (f) Estimating the consequences, (g) Revealing the opponent.

Modeling the way (Silberman, 2005) is a metamorphosis of the sociodrama method that is a method by dramatizing an action or behavior in social relationships. In other words, tutors provide opportunities for students to perform certain activities or roles as in life.

The strategy of active learning type of modeling the way has a predetermined procedure (Silberman, 2005), such as: (a) After the teacher's explanation was completed, using the new learning materials discussed the students were asked to discuss it and then put into practice. (b) the students are divided into several groups to demonstrate the scenarios that had been made, (c) Each group was given the same time to practice and discuss, (d) Each group had a turn to demonstrate the results of the discussions and exercises in front of the class.

This method had advantages such as: (1) Educating students to solve their own social problems that they encounter, (2) Enriching the knowledge and experience of students, (3) Educating students of good language and can show their thoughts and feelings clearly and appropriately, (4) Accepting and respecting others, (5) Fostering the development of children's creativity. Method of Modeling The Way also had weaknesses, such as: (1) Problem solving submitted by students does not necessarily match with the existing situation in society, (2) Due to limited time, the opportunity to play reasonably unfulfilled, (3) shyness leads to mismatch in role play.

Research methods

The research in this article is an experimental study with the randomized design of Post Test Control Group Design to see the effectiveness of using learning model "Modeling The Way" and prove the research hypothesis. The research is conducted on two sample groups, namely the experimental group and the control group.
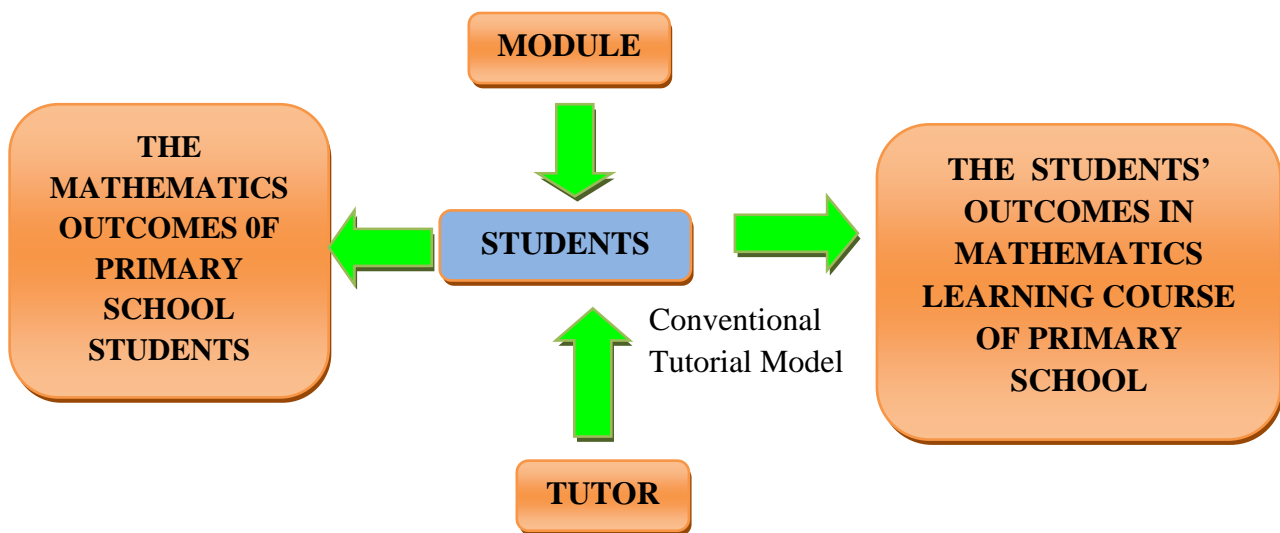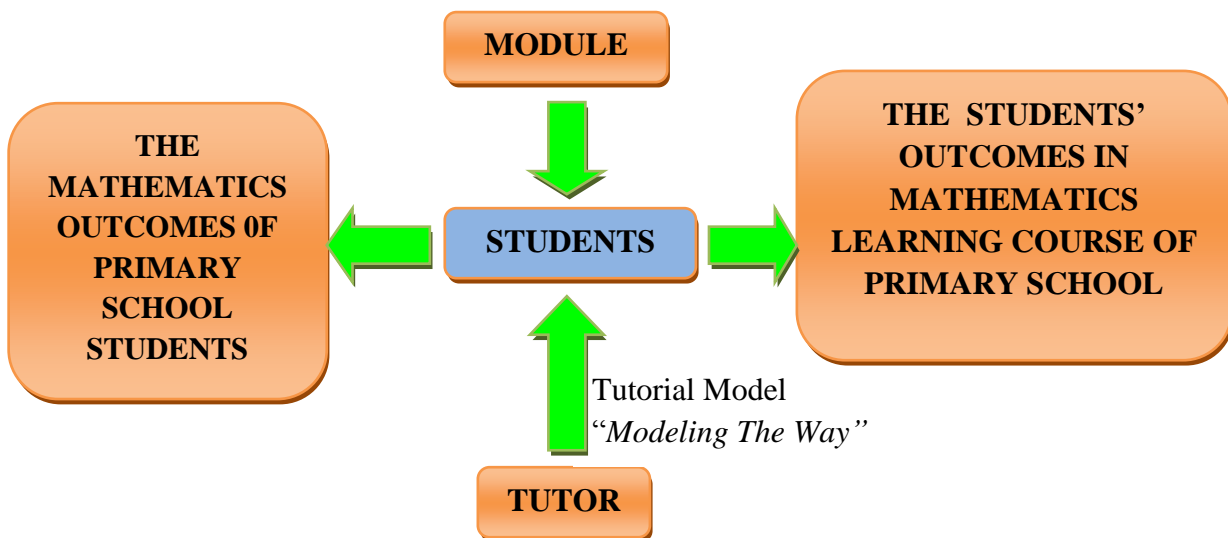
Figure 1. The Control Research Class Design

Figure 2. The Experiment Research Class Design

The research population in this article is students of Universitas Terbuka Medan Regional office (UPBJJ-UT Medan). Samples were taken from two study groups that were viewed from geographical location. Both groups were expected to represent the entire population, so the two groups are the study group Batubara (coastal area), and study groups Mandailing Natal (mountain area). The study was conducted on two representative classes selected randomly from each study group. One for the experimental class and one for the control class. So in this research consists of two experimental classes and two control classes.

The research design uses randomized *Post Test Control Group Design* as illustrated below:

Class	Treatment	Postest
Experiment	*X*	*T*
Control	*Y*	*T*

Description: T : Pos test

X : Treatment is learning by using modeling the way

Y : Treatment, is learning with conventional approach

Variables in this research are: (1) independent variable / treatment, is teaching using modeling the way learning strategy, (2) dependent variable is student learning outcomes after being given treatment (posttest score)., (3) control variable is the variable that has same between groups by materials, tutors and hours (4) Uncontrolled variables are the economic background and health condition of the student, and the distance of the student's residence to the tutorial site. To know the effectiveness of learning strategy of Modeling The *Way* to the result of student learning and primary Student learning, data was collected by using instrument of research that is (1) test which stated in task tutorial during face-to-face lecture (2) questionnaire of student opinion on experiment class about motivation and mastery of delivery of learning materials, (3) tests of primary student learning outcomes that are taught by students from each experimental class and control class. Before it is used, it is tested by giving tests to students who have studied mathematics learning course of primary student and primary school students who have studied the material to be tested. Each test will be

tested to 30 respondents. The test results show a valid and reliable test, with moderate degree of difficulty and differentiated problem tends to be good.

Furthermore, to answer the research problem and to test the hypothesis proposed in this research article, the data was collected and analyze by using descriptive statistical analysis and inferential statistics.

Results and Discussion

Data on Student Learning Outcomes

From the research results obtained 130 data, is the score of tutorial tasks I and II students in the Mathematics Learning Course of Primary School. The data were obtained from the research samples scattered in four classes with details of 62 data obtained from the experimental class by using the method of *modeling the way* and 68 data obtained from control class by using conventional tutorial method (the common method used by tutor). Students' learning outcomes as listed in table 1.

Table 1. The students' Learning Outcomes

	N	$(\bar{x})$	SD	Me	Mo	High Score	Low Score
Totally	130	81.75	2.70	87	85	100	60
Experiment Class	62	83.5	2.35	85	85	100	65
Control Class	68	80.0	3.05	79	80	100	60

Table 1 shows average score, the median and mode from experimental class using the modeling the way learning strategy is higher than the student class taught by using conventional tutorial method. While the standard deviation of the value of the tutorial task of the experimental class students is smaller than the control class . This shows that the distribution of student tutorial assignment scores that are being taught by modeling the way learning is better than the class of students taught by conventional methods.. The difference in value distribution can also be seen from the following frequency distribution table.

Table 2. Distribution of Frequency of Learning Outcomes of Experiment Class Tutorial

No.	Interval	Frequency	FrequencyRelative (%)
1	61 - 68	3	4.84
2	69 - 76	10	16.13
3	77 - 84	20	32.26
4	85 - 92	21	33.87
5	93 - 100	8	12.90
	Total	62	100

Table 3. Frequency Distribution of Learning Outcomes of Control Class Tutorial

No.	Interval	Frequency	Frequency Relative (%)
1	51 - 60	4	5.88
2	61 - 70	17	25.00
3	71 - 80	29	42.65
4	81 - 90	13	19.12
5	91 - 100	5	7.35
	Total	68	100

From Table 2 and 3, it is known that the average of tutorial assignment $(\bar{x})$ experiment class and control class are in same interval 3 class with relative frequency are 32,26% and 42,65% respectively. The relative frequency of the data below the average class value $(\bar{x})$ for the experimental class is 20.97%, lower than the control class (30.88%). Meanwhile, the relative frequency of data above the average class $(\bar{x})$ for the experimental class is 46.77%, higher than the control class (26.47%.). This indicates that relatively more students in the experimental class (using modelling the way learning strategy) which scored above the average score than the control class students and the relatively few students in the experimental class which scored below the average score compared to the control class students. These results can also be seen from the following histogram:
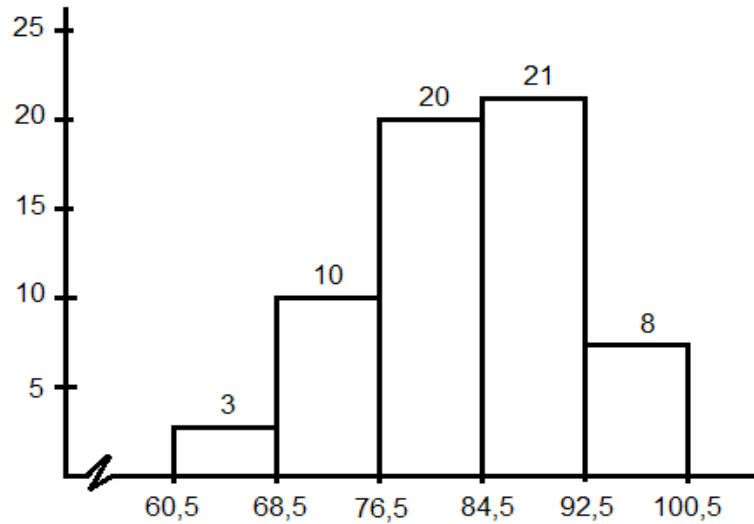
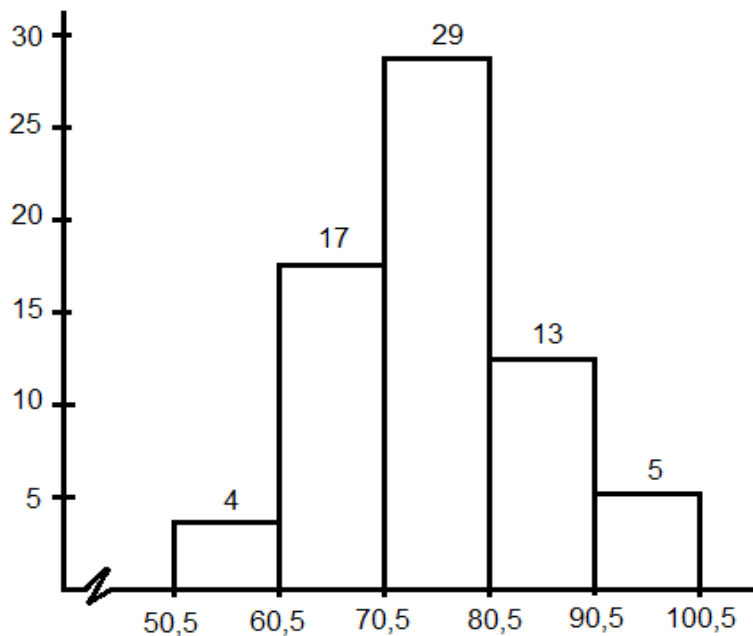Figure 3. Learning Histogram Value of Experiment Tutorial Class

Figure 4. Learning Histogram Value of Control Tutorial Class

The Mathematics Outcomes of Primary School Students

From the research results obtained 211 data, in the form of student learning outcomes on learning mathematics at level 4 dan level 5 primary school. The data obtained from the sample research spread in eight classes with details of 106 data obtained from the experimental class that was given learning by using the learning strategy *modeling the way* and 105 data were obtained from the control class by using conventional learning methods. The results as shown in the table 4 :

Table 4. The Mathematics Outcomes of Primary School Students

	N	$(\overline{x})$	SD	Me	Mo	High Score	Low Score
Totally	211	81.75	2.70	87	85	100	60
Experiment Class	106	78.0	2.6	82	80	100	70
Control Class	105	74.0	3.2	80	75	100	60

Table 4 shows the average, median, and mode mathematics outcomes of Primary students taught by teachers using learning strategies of *modeling the way* (experimental class) is higher than mathematics outcomes of primary students taught by teachers using conventional methods (control class). While the standard deviation of mathematics outcomes of primary school students experiment class is smaller than control class. This suggests that the distribution of mathematics outcomes of primary students taught by learning strategy of *modeling the way* is better than the primary students class taught by conventional methods. Differences in the distribution of learning outcomes can also be seen from the following frequency distribution tables.

Table 5. Frequency Distribution of Mathematic Outcomes of Primary Experiment Class

No.	Interval	Frequency	Frequency Relative (%)
1	69 - 72	3	**2.83**
2	73 - 76	10	**9.43**
3	77 - 80	39	**36.79**
4	81 - 84	16	**15.09**
5	85 - 88	14	**13.21**
6	89 - 92	11	**10.38**
7	93 - 96	5	**4.72**
8	97 - 100	8	**7.55**
	Total	**106**	**100**

Table 6. Frequency Distribution of Mathematic Outcomes of Primary Control Class

No.	Interval	Frequency	Frequency Relative (%)
1	59 - 64	7	**6.67**
2	65 - 70	19	**18.10**
3	71 - 76	36	**34.29**
4	77 - 82	20	**19.05**
5	83 - 88	13	**12.38**
6	89 - 94	6	**5.71**
7	95 - 100	4	**3.81**
	Total	**105**	**100**

From the frequency distribution table of the students' mathematics outcomes, it is known that the average grade $(\overline{x})$ of the experiment and control classes are same in the class interval 3 with the relative frequency of each being 36.79% and 34.29%. The relative frequency of the data below the average grade class $(\overline{x})$ for the experiment class is 12.26%, are lower than the control class (24.77%). Whereas, the relative frequency of data above the average class $(\overline{x})$ for the experiment class is 50.95%, are higher than the control class (40.95%.). This suggests that relative more primary students in the experiment class (using the learning strategy of *modeling the way*) who scored above the average score than students in the control class and the relative is few students in the experiment class who scored below the average score compared with students in the control class. These results can also be seen from the following histogram:
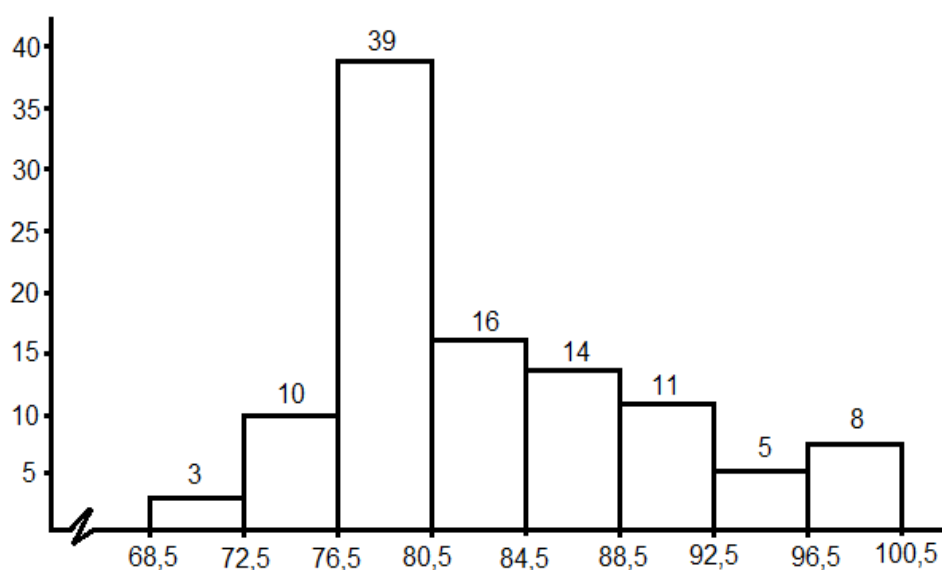

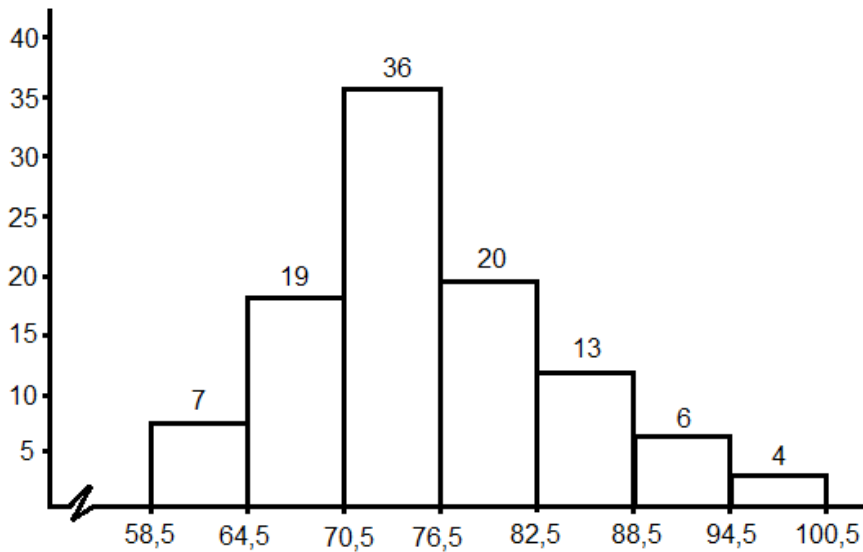Figure 5. Learning Histogram Value of The Experiment Primary School Class

Figure 6. Learning Histogram Value of The Control Primary School Class

Inferentially, this results are still proven through t test analysis but previously done first test the requirements of the use of analysis that is normality test and homogeneity test, and from result of testing requirement of data analysis known that research data is normal and homogenous distribution, so hypothesis testing has been done. Hypothesis testing is done on the results of student learning on mathematics learning course of primary school and on primary student learning outcomes in the class are taught by the students who become the research sample. From the calculation with t-test on the result of student learning on mathematics learning course of primarys, obtained for t count = 6.82 and t_{tabel} = 1.65 at 5% significant level. This means $t_{count} > t_{table}$, thus the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. It can be concluded that the use of learning strategy of modeling the way is better than conventional learning in student tutorial class. While the calculations with t-test on primary student learning outcomes are taught by students, obtained for t count = 9.82 and t_{tabel} = 1.65 at 5% significant level. This means $t_{count} > t_{table}$, thus the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. It can be concluded that the use of the learning strategy of modeling the way is better than conventional learning in the primary school students who are taught by UT students. This result is supported by questionnaire response by students about modelling the way learning strategy, that is 59% students strongly agreed that presentation by modeling the way learning strategy is interested, 56% students agree modeling the way is very useful in providing understanding. 61% students are agreed modelling the way giving more confident to students in delivering learning material to their primary school students and 57% students are agreed

that they're got new ideas in delivering mathematic learning using modelling the way learning strategy.

The results of this research are possible because the tutorial using the learning strategy modeling the way more shows the reality of learning in the classroom, so that students better understand the way of teaching that will be done in each class. The learning strategy of modeling the way makes the classroom tutorial more active, because of learning with peer teaching so that students are more interested to follow the tutorial. This is also because students feel what is obtained in the tutorial class is very useful to apply in their primary student class. The results of this study support the results of research Andrijati (2010) which aimed to see improvements in quality of lectures primary school mathematics education 2 undergraduated PGSD Faculty of Education Unnes by using modeling the way learning strategy. Andrijati found that by using the modeling the way learning strategy, the quality of lectures primary school mathematics education 2 could be improved. Improving the quality of this lecture was marked by the increase of learning outcomes and student learning activities, as well as increased the lecturer's performasnce in studying. The results of this research also in accordance with other previous research that was generally done by the students in the framework of thesis writing. Ma'arif (2011) found out the average score of students learning outcomes of class VII MTs NU 07 Patebon Kendal academic year 2010/2011 using active learning model type of modeling the way was better than using conventional method. Ariana (2014) stated that based on the result of hypothesis testing, there was empirical evidence that the application of learning model of Modeling The Way in improving writing poster ability was more influential compared to Lecture model at SMP Negeri I Lima Puluh. Result of research of Mu'minin (2013) indicated that: (1) learning tool that used in active learning model with modeling strategy of the way got result of average rating equal to 90%, so learning device was categorized very feasible; (2) The result of student learning using active learning model with modeling strategy the way there was difference significantly with student learning result using direct learning model with average result of learning equal to 83 (experiment) and 78 (control).

Although this research had been best attempted, this research could not be separated from the limitations of research methods, field implementation, or in terms of writing the results achieved. Some limitations in this research included: First, in the implementation of research, the treatment was carried out by different tutors in the two tutorial locations under study. So the possibility of treatment conducted by tutors at each location was different although previously been done coaching. Secondly, the students who were the samples of the study

were not strictly controlled, so that the students' early ability in learning and teaching ability gave a significant influence. Thirdly, students who were research samples are not strictly controlled outside of school, so the possibility of learning time from different learning experiences of each subject beyond the treatment provided affects the student's ability.

Conclusions and suggestions

Based on the results of research and discussions that have been described, then taken the conclusion of the use of modeling the way learning strategy can improve student learning outcomes in the course of mathematics learning of primary school which the impact can improve student learning outcomes raised by the students concerned. While the suggestions from the research results are: (1) For tutors in the course of Mathematics Learning of Primary School can use the learning strategy modeling the way in implementing the tutorial, (2) For further researcher can examine the application of modeling the way learning strategy in other courses, to improve student learning outcomes.

References

Andrijati, Noening. 2010. Peningkatan Kualitas Perkuliahan Pendidikan Matematika II melalui Strategi Modelling the Way. *Jurnal Pendidikan*, Vo.27 No. 1, Hal. 45-51

Ariana, S.   Pengaruh Model Pembelajaran *Modelling The Way* (Membuat Contoh Praktik) Terhadap Kemampuan Menulis Poster Oleh Siswa Kelas VIII SMP Negeri Lima Puluh Tahun Pembelajaran 2013/2014' http://digilib.unimed.ac.id/pengaruh-model-pembelajaran-modelling-the-way-membuat-contoh-praktik-terhadap-kemampuan-menulis-poster-oleh-siswa-kelas-viii-smp-negeri-i-lima-puluh-tahun-pembelajaran-20132014-32360.html

Faizin, K. 2011. Pengaruh Pembelajaran Kooperatif Tipe Jigsaw dan Motivasi Belajar Terhadap Hasil Belajar Matematika. *Jurnal Pembelajaran Matematika*, I (1) : 78 – 87.

Ginting, A. 2008. *Essensi Praktis Belajar dan Pembelajaran*. Bandung: Humaniora.

Jannah, M., Triyanto, & Ekana, H. 2013. Penerapan Model Missouri Mathematic Project (MMP) Untuk Meningkatkan Pemahaman dan Sikap Positif Siswa Pada Materi Fungsi. *Jurnal Pendidikan Matematika Solusi*, 1 (1) : 61 – 66.

Ma'arif, A.S. 2011. Efektivitas Model Pembelajaran *Active Learning* tipe *Modelling The Way* dalam Meningkatkan Hasil Belajar Peserta Didik pada Sub Pokok Bahasan Jajar Genjang dan Belah Ketupat Kelas VII di MTs NU 07 Patebon Kendal Tahun

Ajaran 2010/2011. http://library.walisongo.ac.id/digilib/files/disk1/118/jtptiain-gdl-achmadsyai-5865-1-073511002.pdf

Mu'minin, A.M. 2013. Pengaruh Model *Active* Learning dengan Strategi *Modelling The Way* Terhadap Hasil Belajar Siswa Pada Standar Kompetensi Memahami Pengukuran Komponen Elektronika di SMKN 7 Surabaya. ejournal.unesa.ac.id/article/1837/44/article.pdf

Oka, D. W. 2012. Implementasi Strategi Pembelajaran Jigsaw dan Peningkatan Pemahaman Pencegahan Demam Berdarah Dengue. *Jurnal Ilmu Pendidikan,* 18 (2) : 166 – 171.

Setiawan, R. 2012. Meningkatkan Hasil Belajar Matematika Dengan Menggunakan Metode Modelling Dengan Alat Peraga. *Jurnal Mathematics Paedagogic,* III (1) : 28 – 38.

Silberman, M. 2005. *Active Learning "101 Strategi Pembelajaran Aktif"*. Yogyakarta: Yappendis

Soviawati, E. 2012. Pendekatan Matematika Realistik (PMR) Untuk Meningkatkan kemampuan Berfikir Siswa di Tingkat Sekolah Dasar. *Jurnal Penelitian Pendidikan*, 12 (1) : 79 – 85.