THE COMPARISON OF THINK TALK WRITE AND THINK PAIR SHARE WITH TALKING STICK VIEWED FROM STUDENTS' INDEPENDENT LEARNING EIGHTH GRADE STUDENTS OF JUNIOR HIGH SCHOOL

Doni Susanto[1], Mardiyana[2], Dewi Retno Sari Saputro[3]

Post Graduate Program of Mathematics Education, Sebelas Maret University [1,2,3]
(donzmor3@gmail.com[1]), (mardiyana@staff.uns.ac.id [2]), (dewi.rss@gmail.com[3])

Abstract

This research was a quasi-experimental research with 2×3 factorial design. It aimed to determine the learning model between Think Talk Write with Talking Stick (TTW-TS) and Think Pair Share with Talking Stick (TPS-TS) that gave the best achievement on mathematics subject viewed from students' independent learning. The population of this research were all of Junior High School students at the 8th grade in Ngawi Regency, East Java, Indonesia in academic year 2016/2017 which applied KTSP curriculum. The sample was taken by using stratified cluster random sampling. The data were collected by using methods of documentation, students' independent learning questionnaires, and mathematics achievement test. Data analysis technique used two ways analysis of variance (ANOVA) with unequal cell. According to the research findings, it could be concluded that: (1) students' mathematics achievement which were taught by using TTW-TS is as good as students' mathematics achievement which were taught by using TPS-TS in relation and function material, (2) mathematics achievement of students with high independent learning is better than students with medium and low independent learning, and mathematics achievement of students with medium independent learning is as good as students with low independent learning in relation and function material, (3) in each learning model, mathematics achievement of students with high independent learning is better than students with medium and low independent learning, and mathematics achievement of students with medium independent learning is as good as students with low independent learning in relation and function material (4) in each category of high and medium independent learning, student's mathematics achievement which were taught by using TTW-TS is better than student's mathematics achievement which were taught by using TPS-TS and in low independent learning student's mathematics achievement which were taught by using TTW-TS is as good as student's mathematics achievement which were taught by using TPS-TS in relation and function material.

Keywords: Think talk write, think pair share, talking stick, independent learning, relation and function

Introduction

One of appropriate efforts to prepare human resources that have high quality and high grade to compete in global era is through education. Education is important for people because people can develop all of their potentials and become humans who reach their maturity. For creating the purpose of education is not easy, people have to handle some problems that related with quality of education. One of quality education

problems is the low quality in learning mathematics. Mathematics is one of the knowledges that demands logical, critical, and systematical thinking and relates to questions that needs to complete totally and correctly. On the other hand, students consider mathematics lesson is very difficult to know and to understand so that many students do not like mathematics lesson. This statement is supported by Nuriadin et al.(2015: 255) that students who considered that mathematics is very difficult and scarring, so they don't like even hate mathematics lesson. Furthermore, Hannell (Sugiharti and Suyitno, 2015: 385) stated that "Mathematics has always been one of the most significant issues in an individual's life".

It is believed that nowadays many teachers who do learning process in the classroom use direct learning model where it tends to walk direct and focus on the teacher. Absolutely, the students have less chance to participate in teaching and learning activities. In addition, Kimani, Kara and Njagi (2013: 2) stated that if the teacher is ineffective, students under the teacher's tutelage will achieve inadequate progress academically. A learning will be more valueable if students do experiment itself than listen explanation from the teacher. Various learning model can be used by teacher to use in learning process. One of alternative learning model that can be used is cooperative learning model.

According Capar and Tarim (2015: 553) "Cooperative learning was reported to be a more successful method than the traditional method with regard to both achievements and attitudes". Furthermore, Stoian (2016: 52) stated that "cooperative learning is the single most effective educational innovation". There are various cooperative learning models that can be implemented in learning. Among of them are Numbered Head Together (NHT) learning model. It is a learning model in groups that each student in group is given number. After that, teacher calls number from one of students randomly to present the result of discussion of them. Another model is Think Talk Write (TTW) learning model that introduced by Huinker and Laughin. Basically, this model built by thinking, talking, and writing. This model is developed from involving the students from thinking process after reading then talking and sharing idea with other friends or in group and then express in writing or resume based on their creativity. Think Pair Share (TPS) learning model is a learning model that have three steps, namely: thinking, pairing, and sharing. Bamiro (2015: 6) stated that "the use of think-pair-share strategies are capable of promoting learning through discovery, which eventually leads to the development of higher quality cognitive skills".

Some researches have been conducted on each learning model. One of the research is conducted by Susmono (2013). The results of the research implied that TTW, TPS cooperative learning model and conventional learning model gave the same achievement. Whereas, Kusuma's (2014) result of the research concluded that TTW cooperative learning model gave better achievement than TPS learning model and Conventional learning model & TPS better than Conventional learning. In line with Kusuma's, Krisnawati (2011) concluded in her research that TTW cooperative learning model gave better achievement than TPS. The result of research is different because TTW and TPS model have weaknessses on learning steps. On TTW model, the smart student in group who is pointed to present result of discussion gets the better impact then the other students who have less on active participation in learning. Therefore, it needs an effort in order to that case isn't happen. One of the manner is implementing the strategy learning. One of strategy learning that can be used by teacher on learning process in classroom is Talking Stick (TS). On TS strategy uses a stick as indicate tool to turn with give student opportunity to work itself and collaborate with other friends so the students' participation can be optimalized. It also

makes students to be active because of creates a good atmosphere in learning. Renner (Ryan, 2013: 9) stated that "the talking stick strategy may be useful". In this research, TTW and TPS learning model will be modified with Talking Stick strategy.

Based on explanation before, there are some internal factors that can influence success in learning besides learning model and learning strategy. One of them is independent learning. Students must have independent learning ability. According Al-Saadi (Naeeini and Mustapha, 2016: 203) concluded that "independent learners have some features in common. They are responsible, flexible, and curious; they can see the need to learn, hold positive attitude towards learning, set their own objectives, plan their own learning, explore available learning opportunities and resources".

Based on the previous background, the research questions are formulated as follows:

1. Which type of learning model TTW or TPS with Talking Stick that can give the best on mathematics achievement?
2. Which one has the better mathematic achievement, students with high, medium, or low independent learning?
3. In each learning model, which one can give the better mathematics achievement, students with high, medium, or low independent learning?
4. In each level of independent learning, which one can give the better mathematic achievement, students who are given mathematic learning using TTW-TS or TPS-TS with independent learning?

While the benefits of this research are theoretical benefits as reference material for the consideration of next research and produce more detailed knowledge about TTW and TPS learning model and Talking Stick to improve mathematics achievement. Practical benefits: (1) the results of this study are expected to give innovation in education, especially the implementation of the model TTW and TPS with Talking Stick influenced by independent learning of the students (2) As an alternative to the teachers in overcoming the difficulties of students in mathematics learning, namely by choosing a learning model that used in the learning process that suitable with the independent learning of the students. So that the mathematical concept can be understood by students appropriately and effectively.

Finding and Discussion

This research was quasi experimental. The independent variable in this research were a model of learning and independent learning mathematics, while the dependent variable was mathematics achievement. The learning model used were TTW and TPS learning model with Talking Stick. Other independent variables that influenced the dependent variable was independent learning which were divided into high, medium, and low. The research design used in this research was a 2×3 factorial design. The design of the research is as follow.

Table 1 Factorial Design

Learning Model (a)	Independent Learning (b)		
	High (b_1)	Medium (b_2)	Low (b_3)
TTW with *Talking Stick* (a_1)	$(ab)_{11}$	$(ab)_{12}$	$(ab)_{13}$
TPS with *Talking Stick* (a_2)	$(ab)_{21}$	$(ab)_{22}$	$(ab)_{22}$

The populations in this research were all students at grade VIII of junior high schools in Ngawi Regency which implement KTSP curriculum in the academic year 2016/2017. Meanwhile, the sample on this research was 8th students on 3 junior high schools that gathered by taking 3 class on each school. The technique sampling was stratified cluster random sampling. The method of collecting data were documentation method, questionnaire method, and test method. The technique of analyzing the data were normality test with Lilliefors method, homogeneous test with Bartllet method and balance test with t test. Meanwhile, to test the hypothesis, the researcher used two ways which used analysis variance with different cell, and double comparative test with Scheffe' test.

Based on the results of calculation the independent learning questionnaire, the score of the three experimental groups obtained $\bar{x}$ = 90,31 and s = 10.42. Determination of categories based on the following conditions: high group: $x > \bar{x} + \frac{1}{2}s$, medium group: $\bar{x} - \frac{1}{2}s \leq x \leq \bar{x} + \frac{1}{2}s$ and the low group: $x > \bar{x} - \frac{1}{2}s$ so to the score of more than 95.519 categorized as high, for a score more than or equal to 85.098 and less than equal to 95.519 categorized as medium and score of less than 85.098 categorized as low. Summary of learning mathematics achievement data on TTW-TS experimental group, TPS-TS experimental group were presented in Table 1 as follow.

Table 2 Summary of Description Math Achievement Data

Group	N	Average	Standart Deviation
TTW-TS	87	78,299	10,558
TPS-TS	88	74,500	11,488
High Independent Learning	56	79,642	11,600
Medium Independent Learning	71	75,098	10,673
Low Independent Learning	48	74,500	10,683

Prerequisite Test

Normality Test
Normality test was used to determine whether the data from the sample of research were taken from normal distribution of population or not.In this research, normality test used Lilliefors method. Below was the result of normality test with significant level 5%.

Table 3 The Result of Normality Test on The First Ability

Group	L_{obs}	L_{table}	Conclusion
TTW-TS	0,0700	0,0950	Normal
TPS-TS	0,0554	0,0944	Normal

According on Table 2, it can be seen that in each experimental group, L_{obs} < L_{table}. Furthermore, it can be concluded on each sample derived from normal distributed population.

Table 4 The Result of Normality Test on Achievement

Group	L_{obs}	L_{table}	Conclusion
a_1	0,0797	0,0950	Normal
a_2	0,0591	0,0944	Normal
b_1	0,0875	0,1184	Normal
b_2	0,0902	0,1051	Normal
b_3	0,1158	0,1279	Normal

According on Table 4 can be seen in each experimental group, $L_{obs} < L_{table}$ so that it can be concluded on each sample derived from normal distributed population.

Homogeneity Test
Homogeneity test was used to know whether the population of the research have the same variance or not. To test this homogeneity used Bartlett method with Chi square statistic test. Below was the result of Homogeneity test with significant level 5%.

Table 5 The Result of Homogeneity Test on The First Ability

Group	X^2_{obs}	X^2_{tabel}
a_1, a_2	0.0318	3.841

Based on the calculation, it was found $X^2_{obs} < X^2_{table}$ that was $0.0318 < 3.841$ so that it can be concluded that the in the first ability, those two experimental groups have the same variance.

Table 6 The Result of Homogeneity Test on Achievement

Group	X^2_{obs}	X^2_{tabel}
a_1, a_2	2,8296	3,841
b_1, b_2, b_3	3,1128	5,991

Based on the Table 5 before, it can be seen that $X^2_{obs} < X^2_{table}$ so that it can be concluded that the whole group have the same variant or homogeneous.

Balanced Test
Balanced test conducted on two groups experiment class before treatment to determine whether those groups have early ability were equal or not. Statistic test used in balanced test was t test. The result of balanced test with significant level 5% as follow.

Table 7 The Result of Balance Test on Early Ability

t_{obs}	t_{table}	Conclusion
0,2782	2,2611	Balanced

Based on Table 6 can be seen that $t_{obs} < t_{table}$ so that it can be concluded that those two groups experiment class have the same early ability or equal.

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Hypothesis Test

The result of hypothesis test with two ways variance analysis with different cell and significant level 5% was written in Table 7 below.

Table 8 The Resume of Two Ways Variant Analysis With Different Cell

Source	SS	df	MS	F_{obs}	F_{table}	Decision
MODEL(A)	300.060	1	300.060	2.652	3.897	H_0 Accepted
INDEPENDENT LEARNING(B)	1331.049	2	665.524	5.882	3.049	H_0 Rejected
INTERACTION(AB)	332.472	2	166.236	1.469	3.049	H_0 Accepted
ERROR	19120.456	169	113.139			
TOTAL	21084.036	174				

Based on the resume of two ways variant analysis with different cell with significant level 5% on the Table 7, it can be concluded that (1) in the effect of learning model, $F_a < F_{table(a)}$ that was 2.652 < 3.897 so that H_{0A} was accepted. It means that there wasn't a difference between students who were taught with TTW-TS learning model and TPS-TS learning model toward students' achievement in mathematics. (2) in the effect of students independent learning, $F_b > F_{table(b)}$ that was 5.260 > 3.049 so that H_{0B} was rejected. It means that there was a difference between students who have high, medium, and low independent learning toward students' achievement in mathematics. (3) in the interaction of AB (learning model and students' independent learning $F_{ab} > F_{table(ab)}$ that was 1,142 < 3.049 so that H_{0AB} was accepted. It means that there was no interaction between learning model and students' independent learning toward students' achievement in mathematics.

Double Comparative Test

Based on the result of two ways ANOVA, the second hypothesis was rejected, so that it is needed to do a double comparative test on the hypothesis.

Table 9 The Average Cell and Marginal Average

Model	Independent Learning			Marginal Average
	High	Medium	Low	
TTW-TS	82.3333	76.2759	74.3636	78.2989
TPS-TS	78.1429	71.1579	75.6364	74.5000
Marginal Average	80.5000	73.3731	75.0000	

The double comparative test was used *Scheffe'* method as below:

Double comparative test between collumn (Independent Learning)

Table 10 The Resume of Average Between Columns

H_0	F_{obs}	$2F_{0,05,2,256}$	Decision

$\mu_{.1} = \mu_{.2}$	14,6950	6,099	H_0 Rejected
$\mu_{.1} = \mu_{.3}$	6,9714	6,099	H_0 Rejected
$\mu_{.2} = \mu_{.3}$	0,6213	6,099	H_0 Accepted

Based on the Table 9, it can be concluded that (a) H_0 was rejected because $F_{obs} > 2F_{0,05,2,169}$ that was $14,6950 > 6,099$. It means that high independent learning students have the better achievement than those who have the medium independent learning. It can be seen from marginal average $\overline{X_{.1}} = 80.5000 > 73,3731 = \overline{X_{.2}}$ (b) H_0 was rejected because $F_{obs} > 2F_{0,05,2,169}$ that was $6,9714 > 6,099$. It means that high independent learning students have the better achievement than low independent learning students. It can be seen from marginal average $\overline{X_{.1}} = 80.5000 > 75.0000 = \overline{X_{.3}}$ (c) H_0 was accepted because $F_{obs} < 2F_{0,05,2,169}$ that was $0.6213 < 6,099$. It means that medium independent learning students have the same achievement as the low independent learning students.

Conclusion

Based on the findings and the discussion above, it can be concluded that.
(1) TTW-TS learning model creates the same good achievement as TPS-TS learning model in relation and function material. (2) Students' achievements in mathematics who have high independent learning were better than medium and low independent learning students. Students' achievement who have medium independent learning were the same as achievement as low independent learning students in in relation and function material material. (3) In each learning model, mathematics achievement of students with high independent learning is better than students with medium and low independent learning, and mathematics achievement of students with medium independent learning is as good as students with low independent learning in relation and function material. (4) In each category of high and medium independent learning, student's mathematics achievement which were taught by using TTW-TS is better than student's mathematics achievement which were taught by using TPS-TS and in low independent learning student's mathematics achievement which were taught by using TTW-TS is as good as student's mathematics achievement which were taught by using TPS-TS in relation and function material.

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