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THE EFFECTIVENESS OF MIND MAPPING AND BRAINSTORMING TECHNIQUES TO TEACH WRITING TO VISUAL AND READ WRITE LEARNING STYLE STUDENTS

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Abstract

This research was conducted to investigate the effectiveness of Mind Mapping and Brainstorming technique used by students with visual and read-write learning style. The subject of the study was the students of Akademi Analis Kesehatan An Nasher in academic year 2018/2019. The subjects were the students of class A and B, divided into two parts of learning style namely visual and read-write. This research uses 2x2 factorial experimental design. The object of this research was the teaching of analytical exposition text. The instruments used were a test, questionnaire, and observation. The finding of this research indicates that mind mapping and brainstorming strategies were effective in teaching writing to the students with visual and read-write learning style. The result showed that the score of mind mapping strategy was higher than brainstorming strategy. The conclusion of this research has proven that mind mapping technique and brainstorming technique can help and improve the students in writing skill for both students with visual and read-write learning style. It can be concluded that mind mapping strategy was more effective than brainstorming strategy and there was interaction among the technique, writing skill, and students learning style. It is hoped that the students and the teacher can use that technique in teaching and learning process.

Keywords*: Brainstorming, Mind Mapping, Visual and Read Write Learning Style*

Introduction

English is used in many countries as a means of communication. It plays an important role in the world of politics, business, trade, and diplomatic circle. Furthermore, a great deal of works of science, commerce, economy, and technology is written in English. Considering those reasons, Indonesia decided to include English in the school curriculum. In Indonesia English have to teach from elementary school up to university. The purpose of teaching English is to enable the student to master English, so they can apply it in communication. For English, there is a slight different perspective for teachers to interpret competences from psychomotor domains, specific

competencies derived from language system (linguistic competence, sociolinguistic competence, discourse competence and strategic competence), macro-skills (productive; speaking and writing, and receptive skills; listening and reading) and micro-skills or the elements of language (grammar, vocabulary, pronunciation and spelling). All these should be addressed and covered in integrative manners in all KI and KD.

In teaching and learning English as a foreign or second language especially to young learners, the four English skills, writing, listening, speaking, and reading, should not be separated one another. Among the four language skills mentioned a, writing skill is one of the two skills which are tested in the final evaluation. Writing as the productive skill is considered to be more difficult than any other productive skill. Students face difficulties and commit errors in many different writing skills, especially in mechanics (Abdusalam & Mujiyanto, 2017). Therefore, it can be assumed that writing skill is one of the most important skills in the teaching of English in Indonesia.

In terms of writing in Indonesian pedagogical contexts, writing is one of the four language skills that should be taught and mastered in order to acquire English well. Teaching writing at a university level aims to lead the students to gain some competencies which require them to able to express their ideas in written form. In everyday teaching and learning experience, spoken and written languages used are not separated and isolated from each other, but they come together in communication experience. It is likely listening may precede speaking and reading may precede writing. In this case, English teachers must be able to master those basic language skills very well. They are required to comprehend the language (listening and reading) and produce the language (speaking and writing) among the four language skills taught in school. Writing includes the ability to express the students' opinion or taught clearly and effectively in written form. These abilities can be achieved only if the learner can master some technique of writing such as how to gathering ideas about what s/he will write on, how to express them in sequence of sentence, how to organize them chronologically and coherently and how to review and then to revise the composition until the writing is well-built.

In teaching and learning process, the students face many difficulties in writing proficiency. They might think that writing is difficult because writing skills are complex

and difficult to teach. It means that English students should master written English but they find many difficulties how to learn writing. Because we found that the students have difficulty to write a text well based on genre. Especially in analytical exposition, the students face difficulties because of reluctance to question or less motivation, difficult to build and develop their ideas, using of grammar and confusing in determining the generic structure of the text.

Writing is an integrative skill and an important, constructive, and a complex process (Faridi, 2017). The reason why the students still get low achievement in writing is not only from students themselves but also from the teacher. The conventional learning method that teacher applied in teaching writing skills is not effective. During learning activities in the classroom, the teacher only asks the students to read the text, translate the text by using a dictionary and rewrite the translation. The students are not asked to practice their writing ability. In addition, the teacher never makes a variation in teaching and learning process. The teacher has to create interesting activities in the classroom so that the students can develop their idea in writing.

Methodology

This research is a quantitative research, which tried to find the significant result about the use of one teaching technique. According to Muijs (2004:1) "Quantitative research is explaining phenomena by collecting numerical data that are analyzed using mathematically based method (in particular statistics)".

In obtaining the data needed for this research, the writer will determine the population and the sample as the subject of this research. The writer separates the sample into two group, the experimental and the control group. Both of group will be given a pre-test and post-test. The experimental group will be treated to apply Mind Mapping for 6 weeks continuously and the control group will be treated to apply Brainstorming for 6 weeks continuously also.

In this research, a factorial design will be used to gain the data. As stated by Fraenkel & Wallen (2005: 280) that factorial designs extend the number of relationships that may be examined in an experimental study. They are essentially modifications of either the posttest-only control group or pretest-posttest control group design (with or without random assignment), which permit the investigation of additional independent

variables. Another value of a factorial design is that it allows a researcher to investigate the interaction of an independent variable with one or more other variables, sometimes called moderator variables. Referring to this research, the moderator variable is visual and read-write learning style. The method of collecting data in this research, the researcher used written test. The test was used to collect data on students' writing skill and to know the students'achievement.

Results And Discussions

After dividing the class into two group, experiment class one and experiment class two, the students got the pre-test. In here the pre-test was used to determine whether the writing ability of both classes was same. The students also should answer the questionnaire in order to know their learning style. After getting the pre-test, the students got the treatment. Experiment class one got the treatment by using mind mapping technique and experiment class two got the treatment by using brainstorming technique. After the treatment had been given to the students, the researcher gave post-test. The result of mind mapping and brainstorming technique in pre-test and post-test could be seen in the following tables.

Table 1.
Pre-test score of experiment class one and experiment class two

Pre-experiment	Min.	Max.	Mean
Class one visual	50	65	59.27
Class two visual	50	71	59.80
Class one read-write	50	69	58.70
Class two read-write	59	67	63.57

From the data of pre-test score, the result revealed that the mean score of experiment class one with visual and read-write learning style is lower than the mean score of experiment class two with visual and read-write learning style which ranges from 58.98 to 61.57. The pre-test was used to measure the students' writing skill before getting the treatment applied. After applying the pre-test, the researcher gave the different treatment to both experiment classes.

Table 2.
Post-test score of experiment class one and experiment class two

Post experiment	Min.	Max.	Mean
Class one visual	70	79	74.57
Class two visual	71	77	74.00
Class one read-write	72	75	73.60
Class two read-write	71	77	73.29

Based on the data of post-test score, the mean score of post-test increased from the pre-test. The score of post-test in experiment class one is higher than experiment class two. It means that mind mapping technique is more effective than brainstorming technique.

After that, the score of pre-test was calculated by using the statistical calculation in order to know the homogeneity and the normality. The normality test is used to know whether the data is distributed normally or not. If the score is not normal, the treatment cannot be applied because it means that two classes are not equal in their writing skill. The data showed that the significant value of pre-test score in experimental class one was higher than 0.05 (0.200, 0.189, 0.200, 0.200 > 0.05).). In experiment class two the significant value was also higher than 0.05 (0.200, 0.200, 0.200, 0.200 > 0.05). Hence, it can be concluded that all the data were distributed normally.

Table 3.
Homogeneity Test of Pre-test
Test of Homogeneity of Variances
Pre-test.

Levene Statistic	df1	df2	Sig.
.011	1	40	.918

Table 4.
Homogeneity Test of Post-test
Test of Homogeneity of Variances
Post-test.

Levene Statistic	df1	df2	Sig.
3.244	1	40	.079

The value of Levene Statistic is 0.011 and significant value is more than 0.05 (0.918 > 0.05), it means that the data in the pre-test is homogeneous. While the post-test, the value of Levene Statistic is 3.244 and significant value is more than 0.05 (0.79 > 0.05), it means that the data in the post-test is homogeneous. From the two table above, the significant value of both pre-test and post-test score are more than 0.05. It can be concluded that the variance of the data in the pre-test and post-test is homogeneous. Because all the data was normal and homogeneous, so the instruments were appropriate to be given to the students.

Table 5.
Paired Samples Statistic of Experiment Class One with Visual Learning Style
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
P1	Pre-test	59.27	15	5.338	1.378
	Post-test	74.57	15	2.625	.678

The result revealed that the mind mapping strategy was effective to enhance students writing skills with visual learning style in experiment class one. The results also showed that the mean score of posttest in the experiment class one with visual learning style (74.57) was higher than the pretest of the experiment class one with visual learning style (59.27). The N was the same between the pre-test experiment class one with visual learning style and post-test experiment class one with visual learning style. Then the standard deviation of post-test experiment class one with visual learning style is lower than the pre-test experiment class one with visual learning style. While standard error means of the post-test experiment class one with visual learning style is lower than the pre-test experiment class one with visual learning style. It means that the students with visual learning style have the high score and showed improvement.From the table of paired samples t-test, it can be seen that the significant value was 0.000. It was < α (0.05). It means that it was significantly different from using mind mapping to teach writing with a visual learning style in the experiment class one.

Table 6.
Paired Samples Statistic of Experiment Class One with Read Write Learning Style
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
P	Pre-test	58.70	5	7.050	3.153
1	Post-test	73.60	5	1.342	.600

Based on the results, mind mapping strategy was also effective to use in teaching writing to students with read-write learning style. The score of pretest in experiment class one of the students with read-write learning style (58.70) was lower than the score of posttest (73.60). The N is 5 in both of pre-test and post-test in experiment class one with read-write learning style students. Then, the standard deviation of the post-test was lower than in the pre-test. While the standard error means in the post-test is lower than in the pre-test. From the paired sample t-test, the significant value was 0.014. It shows that 0.014 < 0.05. It means that there is a significant difference in the read-write learning style students skill between pre-test and post-test of experiment class one. It means that there was an improvement from the pretest score to posttest score. Therefore, it can be concluded that there was a significant result of using mind mapping technique in teaching writing for visual and read-write learning style students in experiment class one.

Table 7.
Paired Sample Statistic of Experiment Class Two with Visual Learning Style
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
P	Pre-test	59.80	15	4.902	1.266
1	Post_test	74.00	15	1.890	.488

The mean of post-test of students with visual learning style by using brainstorming strategy was (74.00). It was higher than that of the pre-test. The N was the same between the pre-test experiment class two with visual learning style and post-test experiment class two with visual learning style. Then the standard deviation of post-test experiment class two with visual learning style is lower than the pre-test experiment class one with visual learning style. While standard error means of the post-test experiment class two with visual learning style is lower than the pre-test experiment

class two with visual learning style. The significant value was 0.000. It was < α. It means that there is a significant difference in students writing skill of class two of students with visual learning style between pre-test and post-test.

Table 8.
Paired Samples Statistic of Experiment Class Two with Read-Write Learning Style
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
P	Pre-test	63.57	7	2.573	.972
1	Post-test	73.29	7	1.704	.644

The mean score of pre-test of students with read-write learning style by using brainstorming technique was (63.57). It was lower than that of posttest (73.29). The table shows that the mean score of pre-test is lower than the post-test. The N is 7 in both of pre-test and post-test in experiment class two with read-write learning style students. Then, the standard deviation of the post-test was lower than in the pre-test. While the standard error means in the post-test is lower than in the pre-test.From paired sample t-test, it can be seen that the significant value was 0.000. It shows that 0.000 < 0.05. It means that there is a significant difference in the read-write learning style students skill between pre-test and post-test of experiment class two.

Table 9.
Group Statistic
Descriptive Statistics

	Mean		Std. Deviation
	Statistic	Std. Error	Statistic
Experiment class one	74.33	.531	2.375
Experiment class two	73.77	.389	1.824

The mean score of experiment class one is 74.33 and the mean score of class two is 73.77. The table of group statistic between two classes above showed the comparison experimental class one and experiment class two. The standard deviation of each group was 2.375 for experiment class one and 1.824 for experiment class two. While standard mean error experiment class one was 0.531 and that for experiment class two was 0.389. it is clearly stated that the mean score of post-test of experiment class one is higher than experiment class two. It means that mind mapping technique is more

effective rather than brainstorming technique in teaching writing for visual learning style students. Then, it is also explained by the mean score of visual and read-write learning style student for each group. In order to clear the finding of the mean score, here is the chart.

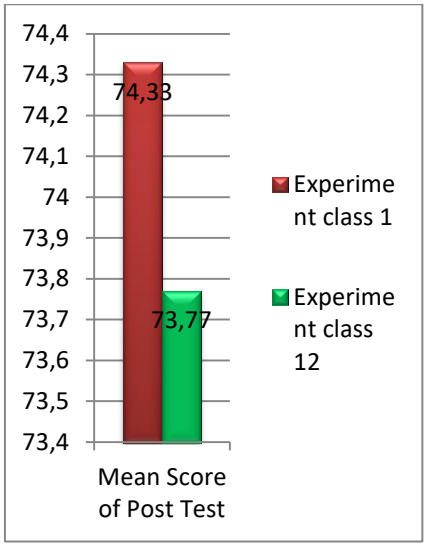

Chart 1 The Mean Score of Post-test

Based on the chart, it is clearly stated that the mean score of post-test of experiment class one is higher than experiment class two. It means that mind mapping technique is more effective rather than brainstorming technique in teaching writing fo visual learning style students. Then, it is also explained by the mean score of visual and read-write learning style student for each group.

From the data, the mean score of students with visual learning style of experiment class one is 74.57. The mean score of students with read-write learning style of experiment class one is 73.60. While the mean score of students with visual learning style of experiment class two is 74.00. The mean score of students with read-write learning style of experiment class two is 73.29. The following chart shows clearly the effectiveness of technique for teaching writing to visual and read-write learning style students.

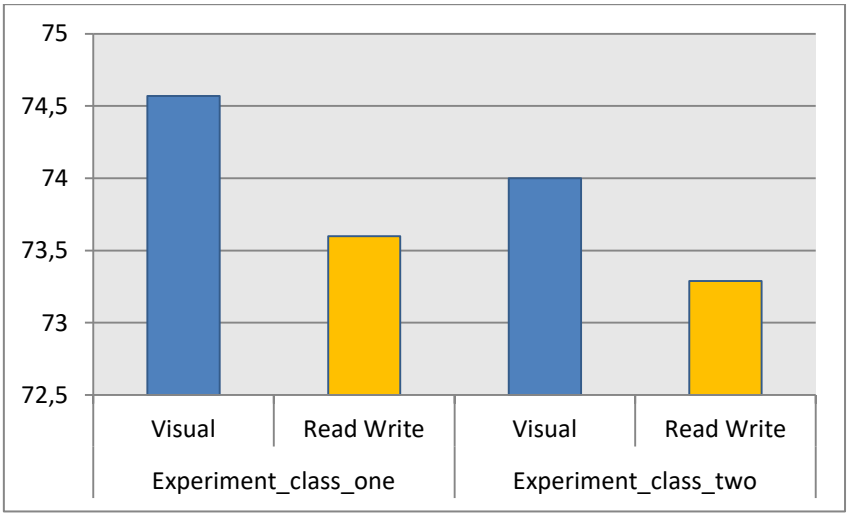

Chart 2. The Mean Score of Visual and Read Write Learning Style Students in Experiment Class One and Experiment Class Two

The mean score of visual learning style students in experiment class one is higher than the mean score of visual learning style students in experiment class two. The mean score of read-write learning style students in experiment class one also higher than the mean score of read-write learning style students in experiment class two. Based on the chart above, it can be seen that mind mapping technique is more effective than brainstorming technique to teach writing to students with visual and read-write learning style.

Table 10 The Significant Calculation of Visual and Read Write Learning Style Students' Score

Univariate Tests

Dependent Variable: Score

	Sum of Squares	df	Mean Square	F	Sig.
Contrast	5.934	1	5.934	1.318	.258
Error	171.062	38	4.502		

The F tests the effect of Learning Style. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Based on the output of SPSS version 24 above, the significant value is 0.258. It is more than 0.05. It means that H_o is accepted and H_I is rejected. The result of hypothesis shows that there is no significant difference between students writing skills of those

who were taught by using mind mapping technique and those who were taught by using brainstorming technique.

In order to measure the interaction among technique, learning style and writing skill of students of Akademi Analis Kesehatan An Nasher, ANOVA was used to analyze the result.

Based on Analysis of Variance significant value is 0.864 more than 0.05. It can be concluded that there is no significant interaction between mind mapping technique and brainstorming technique in enhancing students writing skill of students with visual learning style and read-write learning style. The interaction among technique, students writing skill and students' learning style can be seen in the following chart.

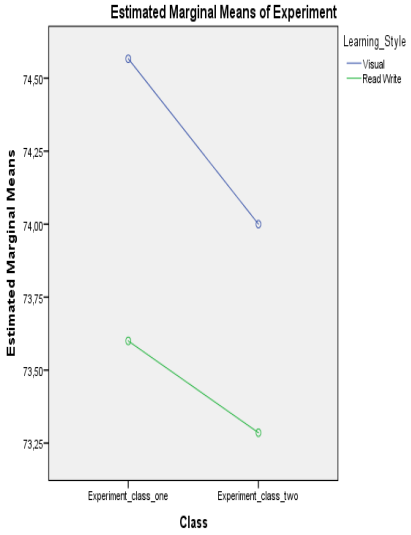

Chart 2. The interaction among Technique, Learning Style, and Writing Skill.

In the chart above, it can be seen that the mean score of experiment class one is higher than experiment class two in both levels of learning style (visual and read-write). While the two line does not intersect. It means that there is no interaction effect. There is no interaction among the strategies, students' interest, and writing skill. As a result, mind mapping technique is better than brainstorming technique but it does not depend on the different learning style.

This part presents the discussion of the research which was conducted to explain the effectiveness of mind mapping and brainstorming technique to teach writing skill to visual and read-write learning style students, in order to know the technique that is more effective to use in teaching writing skill to visual and read-write learning style students,

and to explain whether there is interaction among technique, students' learning style, and writing skill.

Before the treatment, the class was divided into two groups, students with visual and read-write learning style. The researcher gave the questionnaire in order to determine the students' learning style. There are four categories of learning style, they are visual, audiolingual, read-write and kinesthetic. Visual and read-write learning style was used in this research because it has a correlation to mind mapping and brainstorming technique. The questionnaire contained several questions related to their learning style in teaching and learning English. After answering the questionnaire, the score of the questionnaire became the basis to determine whether the students have visual or read-write learning style in teaching and learning English.

Then, the pre-test was given to experiment class one and experiment class two. It was used to know whether their ability in writing was the same level or not. After that, the score of pre-test was calculated by using the statistical calculation in order to know the homogeneity and the normality.The data showed that the significant value of pre-test in experimental class one was higher than 0.05 (0.200 and 0.200 > 0.05). In experiment class two the significant value was also higher than 0.05 (0.200 and 0.189 and 0.200 > 0.05). So, it can be conducted that all the data were distributed normally. From the post-test, it can be seen that the significant value of experiment class one was higher than 0.05 (0.200 and 0.200 > 0.05). In experiment class two, the significant value is also higher than 0.05 (0.200 and 0.200 > 0.05). It means that the data was normally distributed.

The Levene statistic value of pre-test was 0.11 and the significant value was 0.918. The significant values was more than 0.05 (0.918 > 0.05). It means that the data in the pre-test is homogenous. From the Levene statistic value of pre-test and post-test, the variance of the data showed that the characteristics were homogenous. The P-value from both pre-test and post-test were > 0.05. So it can be concluded that the variance of the classes was homogenous. Because all the data was normal and homogenous, so the instruments were appropriate to be given to the students.

The technique being applied are the main differences between experiment class one and experiment class two. The detail description will be explained as follow.

The first hypothesis is mind mapping technique is effective to teach writing to the students with visual learning style. The research result reveals that the mind mapping technique is effective to use in teaching writing to visual learning style students. It is proven to form the result that showed the mean score of post-test in the experiment class one with visual learning style (74.57) was higher than the pre-test of the experiment class one with visual learning style (59.27). From the table above of paired sample t-test, it can be seen significantly different from using mind mapping to teach writing with visual learning style in the experiment class one.

The second hypothesis is mind mapping technique is effective to teach writing to the students with read-write learning style. Based on the result, mind mapping technique was also effective to use in teaching writing to the students with read-write learning style. The score of pre-test in experiment class one of the students with read-write learning style (58.70) was lower than the score of post-test (73.60). Its meaning that there is an improvement from the pre-test to post-test score. From the table paired sample t-test, it can be stated that the significant value was 0.000. It was less than 0.05. So it can be concluded that there is a significant result of using mind mapping technique in teaching writing to read-write learning style in experiment class one.

The third hypothesis is brainstorming is effective to teach writing to students with visual learning style. The mean score of post-test of the students with visual learning style (74.00) was higher rather than pre-test. From the table 4.17, it can be seen that the significant value was 0.000. It was < 0,05.Its meaning that there was a significant result of using a brainstorming technique to teach writing to the students with visual learning style.

The forth hypothesis is brainstorming technique is effective to teach writing to the students with read-write learning style. The mean score of post-test of the students with read-write learning style (73.29) was higher than pre-test. The score increased from the pre-test to post-test. From the table 4.20, it can be seen that the significant value was less than α ($0.000 < 0.05$). It means that there was a significant result of using a brainstorming technique to teach writing to the students with read-write learning style in experiment class two.

The fifth hypothesis is mind mapping technique is more effective to teach writing to the students with visual learning style. The mean score of experiment class

one of the students with visual learning style (74.57) was higher than the mean score of experiment class two of students with visual learning style (74.00). It means that mind mapping technique is more effective than brainstorming to use in teaching writing to the students with visual learning style. So it can be concluded that mind mapping technique is more effective than brainstorming technique to use in teaching writing to the students with visual learning style. Moreover, the significant value (0.258) in the table 4.24 is more than 0.05 which means it is significantly difference. The values show that there is significantly difference between student who were taught by using mind mapping technique and those taught brainstorming technique.

The last hypothesis of the research is there is interaction among technique, students' learning style, and writing skill. In this research, the researcher used ANOVA to analyze the result of the interaction among the technique, students' learning style, and writing skill. From the calculation, the significant value (0.864) was higher than 0.05. It means that there is no interaction among technique, students' learning style, and writing skill. Mind mapping technique is more effective than brainstorming technique to both visual and read-write learning style, but it does not depend on the difference of learning style.

Conclusion

The first result indicated that there was a significant difference in the mean score between pre-test and post-test of visual learning style students taught by mind mapping technique. The result says mind mapping was effective to use in teaching writing to the students with visual learning style.

The second result indicated that there was a significant difference in the mean score between pre-test of experiment class one with read-write learning style and post-test of experiment class one with read-write learning style. It means that mind mapping technique is effective to use in teaching writing to the students with read-write learning style in experiment class one.

The third result showed that there was a significant difference in the mean score between pre-test of experiment class two of students with visual learning style and the

post-test. It means that brainstorming technique is effective to use in teaching writing to the students with visual learning style.

The fourth result explained that there was a significant difference in the mean score between the pre-test of experiment class two of students with read-write learning style and the post-test. It means that brainstorming is effective to use in teaching writing to the students with read-write learning style.

Answering the fifth research questions, there was a significant difference in the effectiveness of mind mapping technique and brainstorming technique to teach writing to the students with visual learning style. It can be seen from the mean score of students in experiment class one with visual learning style which higher than experiment class two. It means that mind mapping technique is more effective than brainstorming technique to use in teaching writing to the students with visual learning style.

The last result showed that there was no interaction among the technique, students' learning style, and writing skill. Mind mapping technique is better for both visual and read-write learning style. Its meaning that mind mapping technique is more effective rather than brainstorming, on the other hand, it depends on the students learning style and their interest in writing.

From the whole result, this research has proven that mind mapping technique and brainstorming technique can help and improve the students in writing skill for both students with visual and read-write learning style.

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