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The Effect of Constructive Imaginative Mind Maps, Vee Maps, and Concept Maps on Students' Attitude and Ability to Write Short Stories at Senior High School (SMAN) 13 Palembang

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Abstract

This study aimed to determine the effect of constructive imaginative mind maps, vee maps, and concept maps on students' attitude and ability to write short stories at SMA 13 Palembang. The research method used was an experimental design. The population of this study was all students of the XI grade at SMA Negeri 13 Palembang. The sample consisted of three classes, namely XI grade MIA 2 with 38 students, XI grade MIA 3 with 36 students, and 32 students from XI grade MIA 4. The instruments used to collect data were tests of short story writing skills and attitude questionnaires using the Likert scale. A one-way Anova test was used to analyze short story data and Mancova was used to analyze the students' attitudinal data. The results showed that the students' scores and attitudes with the use of constructive imaginative mind maps in learning to write short stories were higher than with the use of vee maps and concept maps. The implication of this research is that Indonesian teachers can use constructive imaginative mind maps to improve students' writing skills and attitude.

Keywords: concept map, constructive imaginative, mind mapping, students' attitude, vee map, writing short stories

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1. Introduction

In Indonesia, Bahasa Indonesia, especially writing skills, is one of the academic areas that must be studied by high school (SMA) students. In reality, however, this is not particularly desirable for students. The results of learning to write short stories thus

far are still very low. The research results of Susiawati [1] indicated that the learning of writing short stories is still at a low level and remains unpopular among students.

Writing short stories requires capability in several aspects, such as choosing the theme, the flow, the message to be conveyed, the characters, the attributes, and the style of the language using the literary barrel [2]. The use of language in writing short stories is the ability of an author to use or play with a variety of specific languages during the process of writing a literary work [3]. This is an obstacle for students in writing short stories. In addition, the use of conventional learning techniques also helps to increase students' difficulties in writing short stories.

Students' creativity in writing a short story is very important. Writing is a process of finding ideas, organizing ideas, and writing down ideas with a view to editing and revising essays [4]. In learning bahasa Indonesia, one form of creativity can be seen from the results of the essay.

In the 2013 curriculum, one of the basic competencies that must be achieved in learning bahasa Indonesia in XI grade is "producing a short story text that is coherent in accordance with the characteristics of the text that will be composed, either orally or in writing."This competency has to be achieved by the students, but in reality, it is poorly controlled by them. Therefore, teachers need to apply appropriate techniques in learning, especially in terms of producing or writing short stories.

One learning technique that has been proven to optimize learning outcomes is mind mapping. The concept of mind mapping was originally introduced by Tony Buzan in the 1970s. This technique is also known as "radiant thinking." Mind mapping is very effective when it is used to bring up hidden ideas and create an association between ideas. Mind mapping is also useful for organizing information owned. According to Hernowo [5], mind mapping makes students relate to the subconscious mind before writing; writing becomes more emotional, more colorful, more rhythmic. The writing, in turn, reflects the personal characteristics more accurately. In mind mapping, the brain's working system is naturally regulated. Automatic work is in accordance with the natural human way of thinking. Mind mapping makes the human brain well explored, and works according to its function.

Constructive Imaginative Mind Map (CIMM) is a teaching aid adapted from Buzan's mind mapping that involves the mind in writing short stories. This CIMM activates students' thinking patterns based on existing knowledge by engaging the imagination of a story. Students imagine the content of stories, figures, characterizing, plot, point of view, and the language used in writing short stories.

Mind mapping is a learning material developed by Tony Buzan in the early 1970s. A very remarkable data storage and retrieval system exists within the human brain [6]. Mahamod [7] suggests that mind mapping can help learners to improve their intelligence and thinking skills.

In writing, it is very important to think of essays in the form of mind mapping. Moreover, writing for the purpose of literature such as short stories has stylistic characteristics, in other words the style of writing, including the structure and patterns at the phrase level and overall essay [8]. Therefore, the mind mapping can provide an image that matches the theme or issue of the essay [9].

There are 10 steps required to create a CIMM:

(a) Writing a short story theme in the middle of a piece of blank paper with one or two words.

(b) Writing a picture of the contents of the short story on the first branch of the character's activities such as birthday parties.

(c) Writing down the background of the story on the second arch.

(d) Writing down what conflicts occur in the short story in the third arch.

(e) Writing a rating of the short story, e.g. an assessment of the character in the fourth arch.

(f) Writing the ending of the short story on the fifth arch.

(g) Writing an event at the end of the short story to mark that the short story is over.

(h) Adding a curve in the second, third and so on according to the imagination.

(i) Coloring the CIMM images that have been formed as you wish.

(j) Writing short stories according to the theme, and CIMM images using correct sentences, vocabulary and spelling.

A vee map is often also called a "vee diagram." A vee map is a tool that can be used to help solve a problem or understand a procedure. A vee map has two sides: the conceptual side and the methodological side. The two sides interact with each other to build student knowledge in writing short stories. Vee map images can be as follows.

A concept map (CM) is a learning material used in class activities in the form of diagrams that connect ideas with each other in writing a short story. A concept map is a combination of a theme, content, opinions, ideas, and responses that is then shaped

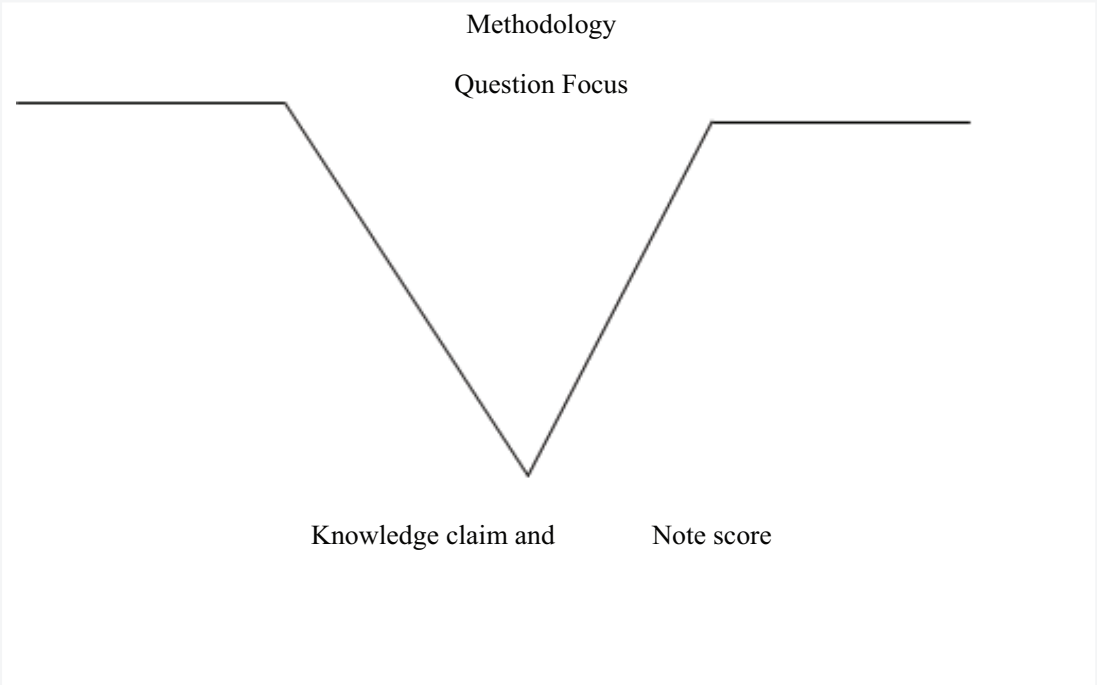

Figure 1: Vee map.

into a meaningful framework of ideas. A concept map can be used as an effort in more effective learning [10]. Furthermore, Sellman et al. [11] argue that a CM can serve as a tool for analyzing concepts in science. A CM is a method of concept mapping using a connector that indicates a link between two or more concepts. The link between two or more of these concepts can help students to write down ideas well.

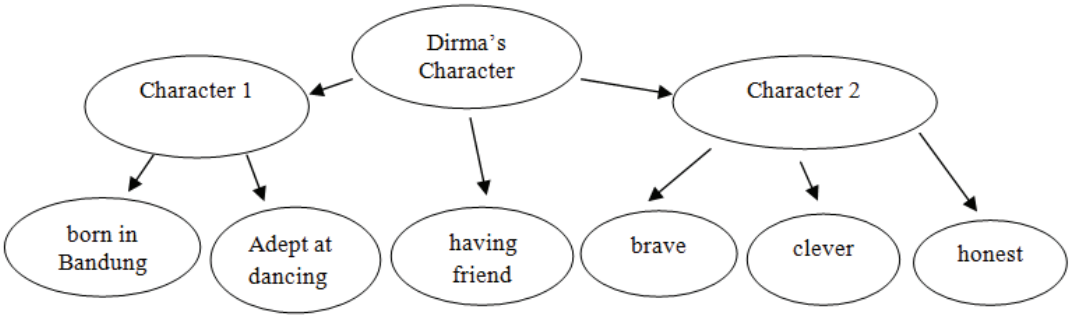

Figure 2: Concept map in the form of hierarchy.

Attitude is a form of evaluation or reaction of feeling that supports or does not support an object [12]. Attitude is a tendency to act positively toward a particular object, institution, concept, or person. In this study, students' attitudes are attitudes toward CIMM, VM, and CM applications. Those attitudes are divided into three sub-scales, namely the attitude of confidence, preferences, and academic efforts with the application of CIMM, VM, and CM in learning to write short stories. Confidence (C),

preference (P), and academic effort (AE) are measured by giving a questionnaire using a Likert scale.

2. Methods

This research uses an experimental method. The research population was all the students of XI grade SMA Negeri 13 Palembang. The sample of this research was XI grade MIA 2 with 38 students, XI grade MIA 3 with 32 students, and XI grade MIA 4 with 36 students. These three classes were assumed to have the same learning ability not the superior classes and were parallel classes and taught by the same teacher, for an equal number of hours, and with the same curriculum. This was to show that these three classes were representative.

The data collection technique used was a test. This was used to determine the students' ability to write short stories. The test was conducted before and after treatment [13]. Students were asked to write short stories in accordance with the learning techniques used in each class. The data for students' attitude was processed from the questionnaire given to the students. The questionnaire contained 45 questions consisting of 15 questions about beliefs, 15 questions about preference, and 15 questions about academic endeavors.

3. Results

3.1. Students' ability in writing short story

A homogeneity test was performed by using the gained data from the three groups, namely CIMM, VM, and CM. Table 1 shows that the data is not homogeneous. This is seen from the significance (sig. 0.03 < 0.05). Therefore, data analysis was performed using Welch and Brown and Forsythe exams.

Table 1: Data homogeneity test.

Levene Statistic	df1	df2	Sig.
5.991	2	103	.003

According to Table 2, the Welch and Brown-Forsythe tests show that there is a significant difference between the three groups of data. For further tests the Kruskal-Wallis test was used. This was done to prove the significance of data more real. The Kruskal-Wallis test results can be seen in Table 3 below.

Table 2: Test of significance of data with Welch and Brown-Forsythe tests.

	Statistic	df1	df2	Sig
Welch	22.88	2	62.92	.000
Brown-Forsythe	25.08	2	80.75	.000

Table 3: Kruskal-Wallis nonparametric statistics.

Null Hypothesis	Test	Sig.	Statement
The gained distribution is the same for the group category	Kruskal-Wallis	.000	Reject Null Hypothesis

The Kruskal-Wallis test results in Table 3 show that the data between the three groups show a significant difference of 0.000 at the 0.05 significance level. Thus, the null hypothesis that expresses the same gained distribution for all categories is rejected as seen in the statement column. The results of this analysis indicate that there is an ordered mean of the three groups of CIMM, VM, and CM.

Table 4: Average comparison of pre- and posttest.

Group	Number	Mean	
		Pre	Post
CIMM	38	63.2	77.3
VM	36	64.3	72.8
CM	32	64.2	69.7

Table 4 above shows that the average difference between the pre- and posttest for the CIMM collection compared with VM is 4.5 (77.3–72.8), the average difference group between VM and CM is 3.1 (72.8–69.7) while the average difference of group between CIMM and CM is 7.6 (77.3–69.7). A big difference is seen in the group taught with CIMM compared to the VM and CM techniques. This shows that there are different results of the learning outcomes of the three groups in writing short stories.

Table 5: Significance of differences test.

SoV	SS	Df	MS	F	P-value	F crit
Among group	1389.1	2	694.56	24.24	2.35996E-09	3.084577
In group	2951.4	103	28.654			
Total	**43.40.5**	**105**				

Table 5 shows that there are significant differences between the three sets (CIMM, VM, and CM) due to the p-value of 0.00000000236. This data indicates that there is a possibility that CIMM is different from VM, and CIMM is different from CM, but it is also possible that VM and CM are not necessarily different. Therefore, it is necessary to do a post hoc test using the Tamhane test.

Table 6: Tamhane statistics test.

Test	(I) Group	(J) Group	Different Mean (I-J)	Sig.
	CIMM	VM	5.62774*	.001
Tamhane		CM	8.51316*	.000
	VM	CIMM	-5.62774*	.001
		CM	2.88542*	.017
	CM	CIMM	-8.51316*	.000
		VM	-2.88542*	.017

Table 6 shows that there are significant differences between the three groups of data (pairwise). Comparison of the three groups namely CIMM, VM, and CM of each significance (sig < 0.05). Different mean of CIMM and VM is 5.62774 with a significance of.001, CIMM and CM is 8.51316 with a significance of 0.000. VM and CIMM show a mean difference of -5.62774 with a significance of.001. VM and CM show a mean difference of 2.88542 with a significance of.017. CM and CIMM show a different mean of -8.51316 with a significance of.000. CM and VM show a different mean of -2.88542 with a significance of.017.

Post hoc tests are conducted with Dunnett's T3 to ascertain which groups are different.

Table 7: Dunnett's T3 statistical test.

Test	Group I	Group J	Different Mean (I–J)	Sig.
	CIMM	VM	5.62774*	.001
		CM	8.51316*	.000
Dunnett's T3	VM	CIMM	-5.62774*	.001
		CM	2.88542*	.017
	CM	CIMM	-8.51316*	.000
		VM	-2.88542*	.017

Table 7 shows that there are significant differences for the three data sets (pairwise). The CIMM versus the VM group has significant differences (sig 0.01 < 0.05). Similarly,

among groups of CIMMs compared to CM groups there is a very significant difference (sig. 0.000 < 005). However, when comparing VM with CM, there is no significant difference (sig. 0.17 > 0.05).

3.2. Students' attitude

The Mancova test was applied to determine the effect of independent variables (CIMM, VM, and CM) on the dependent variable (attitude of confidence subscale, preference, and academic effort) by using Pillai's Trace test, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root.

Table 8 shows that there are significant independent variables ($F = 4.114$ with $p < 0.05$), which is evident from the multivariate test decision with Pillai's Trace test (sig. 0.001), Wilks' Lambda (sig. 0.01), Hotelling's Trace and Roy's Largest Root (each sig. 0.000). This decision indicates that CIMM, VM, and CM are factors that influence the attitude subscales of confidence preference, and academic efforts.

Significantly, the effect of independent variables (CIMM, VM, and CM) on the dependent variable can be seen. The results show that the attitude subscale of confidence has $F(1.106) = 121.008$, $p < 0.05$, that of preference has $F(1.106) = 4.881$, $p < 0.05$ and that of academic efforts has $F(1.106) = 8.118$, $p < 0.05$.

The Squared R value in Table 8 shows that the free variable contributes as much as a 0.726 or 72.6% change in the dependent variable subscale of confidence attitude. The attitude subscale of preference contributes a 0.996 or 99.6% change in the dependent variable of the attitude subscale of preference. The attitude subscale of academic efforts accounts for a 0.957 or 95.7% change in the dependent variable of the attitude subscale of academic efforts.

For the mean comparison of the dependent variable with the three groups the mean of each group was analyzed.

In Table 9 it is explained that the average attitudes subscale of post-academic efforts between the three groups is different. The mean of attitudes subscale of the post-academic effort of students taught by CIMM is greater than for those taught using the VM and CM techniques.

The pretests of the CIMM, VM, and CM groups show no significant difference because only 0.01 or less than 1. Posttest results indicate that there is a difference in mean score test between the three groups. These results indicate that there are significant differences in the results of short story writing. The average results of the

Table 8: Mancova Test of Attitude Subscale of Confidence, Preference, and Academic Effort.

DV/ IDV	Test	Score	F	Hypothesis df	Error df	Sig.
	Pillai's Trace	.222	4.114	6.000	198.000	.001
Groups	Wilks' Lambda	.785	4.201[b]	6.000	196.000	.001
	Hotelling's Trace	.265	4.286	6.000	194.000	.000
	Roy's Largest Trace	.227	7.496[c]	3.000	99.000	.000
C-pre	Pillai's Trace	.550	39.885[b]	3.000	98.000	.000
	Wilks' Lambda	.450	39.885[b]	3.000	98.000	.000
	Hotelling's Trace	1.221	39.885[b]	3.000	98.000	.000
	Roy's Largest Trace	1.221	39.885[b]	3.000	98.000	.000
	Pillai's Trace	.992	3815.060[b]	3.000	98.000	.000
P-pre	Wilks' Lambda	.008	3815.060[b]	3.000	98.000	.000
	Hotelling's Trace	116.788	3815.060[b]	3.000	98.000	.000
	Roy's Largest Trace	116.788	3815.060[b]	3.000	98.000	.000
AE-pre	Pillai's Trace	.898	286.281[b]	3.000	98.000	.000
	Wilks' Lambda	.102	286.281[b]	3.000	98.000	.000
	Hotelling's Trace	8.764	286.281[b]	3.000	98.000	.000
	Roy's Largest Trace	8.764	286.281[b]	3.000	98.000	.000
a. R Squared =.726 (Adjusted R Squared =.712)						
b. R Squared =.996 (Adjusted R Squared =.996)						
c. R Squared =.957 (Adjusted R Squared =.955)						
d. Computed using alpha =.05						
Explanation:						
IDV = independent variable						
DV = dependent variable						
KY-pre = attitude subscale of confidence pretest						
KS-pre = attitude subscale of preference pretest						
UA-pre = attitude subscale of academic effort pretest						

short story group taught by CIMM are higher than those taught using the VM and CM techniques.

Learning by using CIMM can improve the students' ability to write short stories at SMAN 13 Palembang due to the clear, directed, and creative learning steps. The results

Table 9: Comparison of mean scores of groups.

DV	Groups	Numbers	Mean	Standard error
	CIMM	38	58.539[a]	.657
C-post	VM	32	57.251[a]	.699
	CM	36	57.235[a]	.659
	CIMM	38	57.043[a]	.091
P-post	VM	32	57.122[a]	.097
	CM	36	56.735[a]	.092
	CIMM	38	57.181[a]	.242
AE-post	VM	32	56.504[a]	.258
	CM	36	55.778[a]	.243

a. Covariates appearing in the model are evaluated at the following values: Keyakinan-Pra = 57.19, Sikap-Pra = 56.87, Usaha-Pra = 55.78.

of this study prove that CIMM can improve the students' ability to write short stories at SMAN 13 Palembang. The results of this study also support what is proposed by Buzan [6], Mahamod [7], Hernowo [5], Holiah and Indrawati [14], Ernalida and Ayob [15], and Hariri [16] that mind mapping can be used in learning to enhance students' creativity.

In addition, the application of CIMM may influence students' attitudes. This supports Ayob's research [17] on the university's preference attitude and confidence in the use of multimedia.

4. Conclusion

The results of the analysis indicate that there is a difference in the ability to write short stories between students taught by CIMM and those taught using VM and CM techniques. Thus, CIMM can be used in learning to write short stories by following the steps of learning systematically. Teachers are advised to use CIMM as an alternative in learning to write short stories in high school. This technique can be modified by the teacher according to the situation and conditions in the classroom or in each school.

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