The Effect Of Graphic Organizers In Argumentative Essay Across Different Proficiencylevelsat Higher Education

by Turnitin Nursamsu

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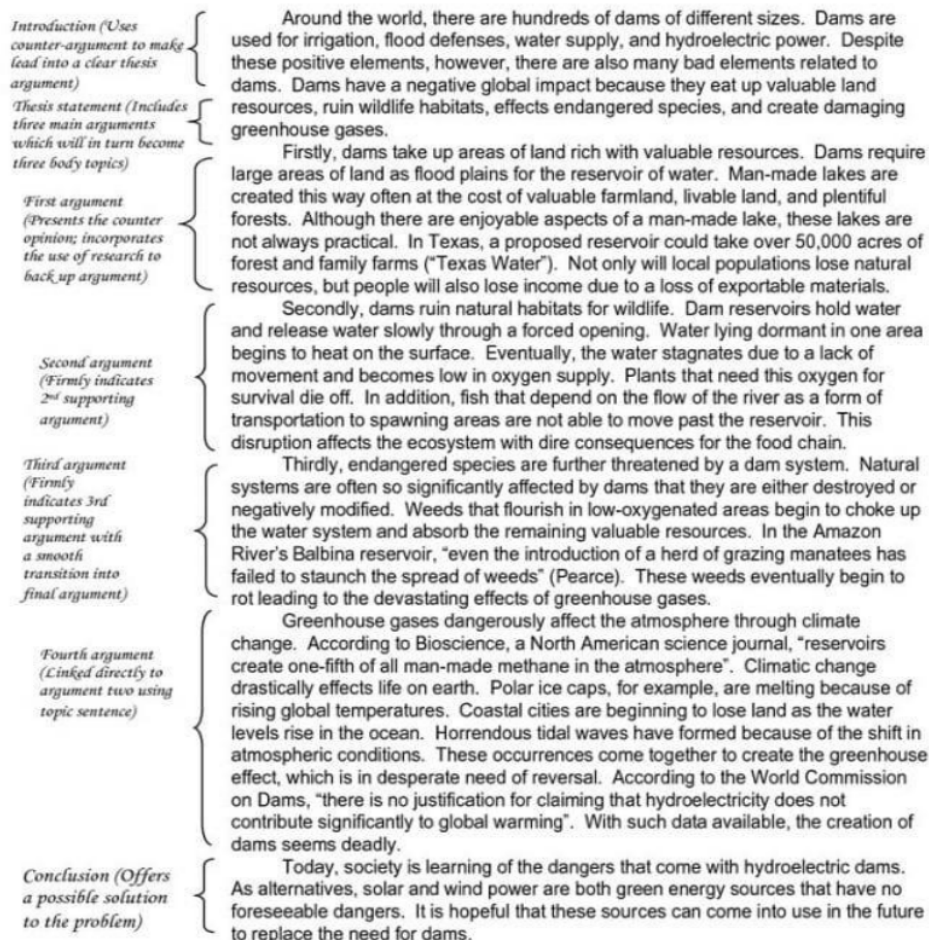| Article Info	Abstract
	The investigation attempted to investigate the different interventions using digital graphic organizers (x1) , paper graphic organizers(x2),free writing (x3) on writing score of low (y1) , moderate (y2), and of high level proficiency learners (y3). The 45 participantswere L2 learners at UIN Tulung Agung consisting of low level proficiency learners (n=13), moderate level proficiency learners (n=21), high level proficiency learners (n=11). The study belonged to a pre-post quasi-experiment using factorial design. The data were analysed using Manovatest. The analysis demonstrated that a significant difference effect occurred between teacher's interventions (Digital Graphic Organizer (DGO), Paper Graphic Organizer (PGO) and Free Writing (FW)) on the learners' writing test scores (low, moderate, and high level of proficiency), F (2, 45) = 0.075, p = 0.000; Wilk's lambda = 35.363, partial eta squared = 0.726. It meant that all interventions (DGO, PGO, and FW) gave facilitative effect to the learners' writing test scores (low, moderate, and high level of proficiency) at higher education. The study accepted the ho stating that there were no interaction effect amongst intervention using graphic organizers in argumentative writing at the low, moderate and high level of writing proficiency learners, and rejected the alternative hypothesis. Based on the finding, the most appropriate technique was Digital Graphic Organizer (DGO), followed by Paper Graphic Organizer (PGO) and Free Writing (FW) to all level of learners' proficiency writing. The finding contributed to the body of knowledge especially to theschemata theory.

Introduction

Amongst the linguistic skills, writing is regarded as the hardest skill to understand. Teachers frequently complain that learners have restricted ability to write an essay and express ideas and thought in written English (Unzueta, 2009, p.1). The argumentative writing skill is more complicated one compared to the other types of writing.An argumentis an academic discourse discussing a certaintopic, where a writer's stance is presented, reasons and evidences are displayed, claim, counter claim is presented, and refutation is performed (Tsai, 2006, p.17). The performance of argumentis measured in seven categories: the introduction, reasons, supporting detail, evidences, counterclaim, claim, and conclusion. The introduction introduces the topic and acts as a roadmap for the whole composition (Muniandy& Ram, 2011). Then, the body paragraph covers the reasons for claim. Supporting details are very important since they give reasons the writer'sopinion and make the argument convincingly. Additionally, the evidence provides facts, illustration and exampleslinked to the writer's claim. Meanwhile, the counterclaim displaysarguments. The rebuttal claim displays response to the counterclaim. Lastly, the concluding paragraphsum up the arguments and supporting points (Muniandy& Ram, 2011).Language instructors should provide learners with more chance to engage each other to share information or ideas in writing practice (Styati&Latief, 2018). The model of argumentative essay is shown in Figure 1.

Essay Styles

AN ARGUMENTATIVE ESSAY
The Dangers of Dams

Introduction ('Uses counter-argument to make lead into a clear thesis argument)

Around the world, there are hundreds of dams of different sizes. Dams are used for irrigation, flood defenses, water supply, and hydroelectric power. Despite these positive elements, however, there are also many bad elements related to dams. Dams have a negative global impact because they eat up valuable land resources, ruin wildlife habitats, effects endangered species, and create damaging greenhouse gases.

Thesis statement (Includes three main arguments which will in turn become three body topics)

First argument (Presents the counter opinion; incorporates the use of research to back up argument)

Firstly, dams take up areas of land rich with valuable resources. Dams require large areas of land as flood plains for the reservoir of water. Man-made lakes are created this way often at the cost of valuable farmland, livable land, and plentiful forests. Although there are enjoyable aspects of a man-made lake, these lakes are not always practical. In Texas, a proposed reservoir could take over 50,000 acres of forest and family farms ("Texas Water"). Not only will local populations lose natural resources, but people will also lose income due to a loss of exportable materials.

Second argument (Firmly indicates 2nd supporting argument)

Secondly, dams ruin natural habitats for wildlife. Dam reservoirs hold water and release water slowly through a forced opening. Water lying dormant in one area begins to heat on the surface. Eventually, the water stagnates due to a lack of movement and becomes low in oxygen supply. Plants that need this oxygen for survival die off. In addition, fish that depend on the flow of the river as a form of transportation to spawning areas are not able to move past the reservoir. This disruption affects the ecosystem with dire consequences for the food chain.

Third argument (Firmly indicates 3rd supporting argument with a smooth transition into final argument)

Thirdly, endangered species are further threatened by a dam system. Natural systems are often so significantly affected by dams that they are either destroyed or negatively modified. Weeds that flourish in low-oxygenated areas begin to choke up the water system and absorb the remaining valuable resources. In the Amazon River's Balbina reservoir, "even the introduction of a herd of grazing manatees has failed to staunch the spread of weeds" (Pearce). These weeds eventually begin to rot leading to the devastating effects of greenhouse gases.

Fourth argument (Linked directly to argument two using topic sentence)

Greenhouse gases dangerously affect the atmosphere through climate change. According to Bioscience, a North American science journal, "reservoirs create one-fifth of all man-made methane in the atmosphere". Climatic change drastically effects life on earth. Polar ice caps, for example, are melting because of rising global temperatures. Coastal cities are beginning to lose land as the water levels rise in the ocean. Horrendous tidal waves have formed because of the shift in atmospheric conditions. These occurrences come together to create the greenhouse effect, which is in desperate need of reversal. According to the World Commission on Dams, "there is no justification for claiming that hydroelectricity does not contribute significantly to global warming". With such data available, the creation of dams seems deadly.

Conclusion (Offers a possible solution to the problem)

Today, society is learning of the dangers that come with hydroelectric dams. As alternatives, solar and wind power are both green energy sources that have no foreseeable dangers. It is hopeful that these sources can come into use in the future to replace the need for dams.

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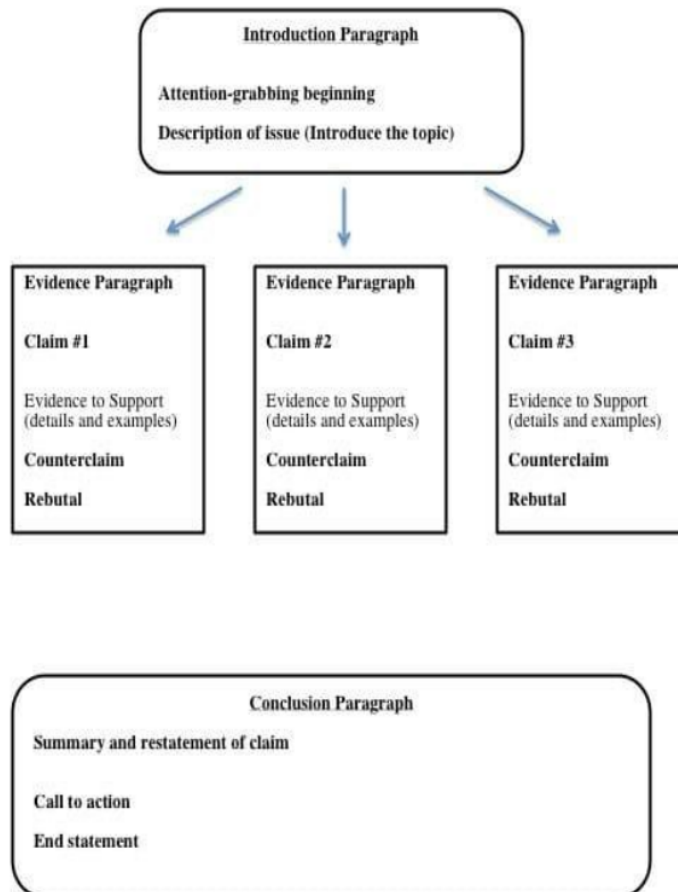
Figure 1.The model of argumentative essay

Prior investigations also found that EF learners are less proficiency to write persuasive essays (Spawa& Hassan, 2013). Moreover, Mohamed, (2016) discovered that EFL learners are weak in writing argumentative essay. In addition, Bipinchandra et al. (2014) found that EFL learners cannot link ideas in writing argumentative essay, since they focus on product rather than process. Then, Ponnudurai (2011) discovered that learners get difficulties in writing argumentative essay because lack of vocabulary. In contrast, (Tayib, 2015) discovered that the problem lie on the insufficient methods of teaching provided by the teacher. The teaching methods in higher

educations are regarded fail to provide enough supports for learners to compose argumentative essays (Hussin, 2008). The today's teaching methods need both linguistic skills and critical thinking, namely, displaying ideas, convincing opinions, generating ideas and evaluating facts to establish judgments. Therefore, teachers need to develop interactive learning method (French & Kennedy, 2016). In this case, Zakrajsek (2018) states that the way the teachers teach can contribute negative affect on learners' studying as it is connected to inappropriate to deliver the course such as monotonous, boring presentation, and distributing old materials. Furthermore, Mann (2009) suggests that teachers should give more opportunities for interaction amongst learners. Based on the above explanation, it is deemed necessary to have teaching materials that are easily understood by the students and provide information related to writing skill (Tomlison, 2012). A powerful technique used to improve writing skills is to use Graphic Organizer. Faull (2007) in his research revealed that using Graphic Organizer could add variation in the process of learning to write. Furthermore, this model can help students organize information into a structured concept and it connects it with another concept (Zaini, Mokhtar, &Nawawi, 2010). Graphic organizer is used by teachers to support learning. One of the suitable types of Graphic Organizer used to develop writing narrative teaching materials is circle organizer. This graph can be used to assist learners to understand the sequence of events experienced in a coherent and orderly manner. Each circle represents the sequence of events experienced by students. This is proven in the research conducted by Tayib (2015), Lancaster, K (2013), Chien, C, W. (2012), Ibnian (2010) Mercuri (2010), LiouHsien Chin (2014) who believed that GO is influential in increasing and developing writing skill for students.Due to the facts above, the study proposes graphic organizers (GO) to figure out the problems in classroom writing.

Graphic organizer is a procedure that aids learners and language instructors to structure information and connection of concepts. Stamper (2006, p. 5) believed that GOs are graphic representation of connection between ideas and concepts. Shoari (2012) argue that graphic organizers guide learners to describe and draw visual diagrams. It facilitates learning and aids learners in recognizing the missing data. Ellis (2004) states that there are three important facts the importance of graphic organizers. First, learners will remember easily the course. Second, graphic organizers facilitates comprehension and learning process. Third, learners are created to become strategic learners. Consequently they will learn better and faster. Stamper (2006) states that graphic organizer can be implemented to various learning situations for learners: big class or small class, group or individual. It also motivates learners in learning process. Miller (2011) confirms that GOs provide visual display of ideas helping students organizing their thoughts. Additionally, Kajder (2005) states that graphic organizer (GO) aids learners understanding and analyzing the learning materials based on the suitable procedures. The organizers assist learners identifying the topic and supporting details of a text.   The model of graphic organizer for argumentative essay is shown in Figure 2.

Name: _____   Date: _____

Argumentative Essay Graphic Organizer

Introduction Paragraph

Attention-grabbing beginning

Description of issue (Introduce the topic)

Evidence Paragraph	**Evidence Paragraph**	**Evidence Paragraph**
Claim #1	**Claim #2**	**Claim #3**
Evidence to Support (details and examples)	Evidence to Support (details and examples)	Evidence to Support (details and examples)
Counterclaim	**Counterclaim**	**Counterclaim**
Rebutal	**Rebutal**	**Rebutal**

Conclusion Paragraph

Summary and restatement of claim

Call to action

End statement

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Figure 2. The model of graphic organizer for argumentative essay.

Ausubel (1963) is considered to be the founder of GOs. Ausubel argues that new learning is affected by the learners' background knowledge represented in the student's hemisphere in the form of cognitive structure. He

confirmed that GOs facilitate learning by providing a structured framework to the background information to be connected with new information (Ausubel, 1963; Kim, Vaughn, Wanzek, & Wei, 2004). The GOs combined both new and old information and assisted learners establishing the relevant schemas (Dye, 2000). If the schema is activated, it will form a framework. The theory underlying GO is dual coding theory. In the view of this theory, there are two systems of processing information: visual and verbal. Both are strongly linked each other. GOs employ the visual system to enhance the operation of verbal system. Another theory underlying GO is Schemata theory. This theory believes that memory is consisted of a network of schemas. The other theory underlying GO is cognitive load theory. This views that memory can handle a limited information at a time because of its built-in structure. GOs can decrease the cognitive load and thereby improve the processing resources. Here, GO provides facilitative tools in learning materials.

There are some investigations exploring the effect of GOs in argumentative writing. For example, Unzueta and Barbetta (2012) found that GOs can help the overall organization of the learners' compositions. Then, Meera and Aiswarya (2014) demonstrated that GO improved writing skills in writing argumentative essay. Then, Maad and Maniam (2017) examined the effect of GOs in generating ideas for argumentative writing. They found that there was an increase in the experimental group. Next, Hamiche (2017) observed the influence of GOs on argumentative essay. He demonstrated that the GO is an effective method to teach argumentative writing. To sum up, the previous investigations examining the effect of GOs in argumentative essay writing found that GOs can improve learners' skills in writing. Although there have been many studies on graphic organizer, a few attention has been conducted to effect of graphic organizers in l2 argumentative writing class at higher education with considering the learners' level of proficiency in writing.This study fuilfills as bridge to the gap.The research questions of the study are: (RQ1) Is there any significant difference amongst intervention using graphic organizers in argumentative writing at the low level of writing proficiency learners? (RQ2) Is there any significant difference amongst intervention using graphic organizers in argumentative writing at the moderate level of writing proficiency learners? (RQ3) Is there any significant difference amongst intervention using graphic organizers in argumentative writing at the high level of writing proficiency learners? (RQ4) Is there an interaction effect amongst intervention using graphic organizers in argumentative writing amongst the high, moderate and low level of writing proficiency learners? The objective of the investigation were to measure: (a) whether there is a significant difference or not amongst intervention using graphic organizers in argumentative writing at the low level of writing proficiency learners; (b) whether there is a significant difference or not amongst intervention using graphic organizers in argumentative writing at the moderate level of writing proficiency learners; (c) whether there is a significant difference or not amongst intervention using graphic organizers in argumentative writing at the high level of writing proficiency learners; (d) whether there is an interaction effect or not amongst intervention using graphic organizers in argumentative writing at the low level of writing proficiency learners. The theoretical framework is illustrated in Figure 3.
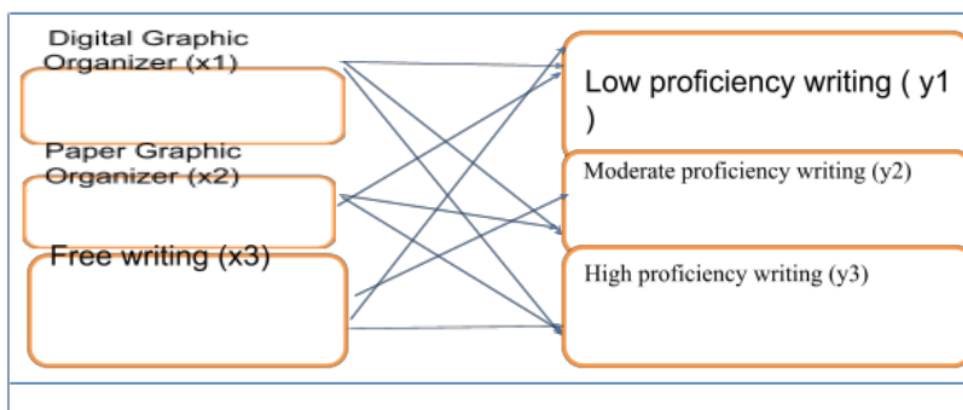

Figure 3. Theoretical framework

The study uses quasi experimental design using factorial design. (Creswell, 2002). The data are analysed using one way Manova. There are four variables involved in this study. The predictor grouping variable consisted

ofintervention using graphic organizers consisting of digital graphic organizers (x1) , paper graphic organizers(x2),free writing (x3). Meanwhile, the outcome variables werewriting score of low level proficiency learners (y1) , writing score of moderate level proficiency learners (y2) , writing score of high level proficiency learners (y3).In the present study, the45 participantsconsisting of low level proficiency learners (n=13), moderate level proficiency learners (n=21), high level proficiency learners (n=11).The participants are L2 learners at Islamic state institute. The design of each group as illustrated in Table 1 .

Table 1. Desain nonequaivalent control group

Teaching Interventions	EFL writing class (A)		
	low proficiency (A1)	moderate proficiency (A2)	high proficiency (A3)
digital graphic organizers (B1)	A1B1	A2B1	A3B1
Paper graphic organizers (B2)	A1B2	A2B2	A3B2
Free writing (B3)	A1B3	A2B3	A3B3

Notes

A1B1 : Teaching EFL writing class of low proficiency learners using digital graphic organizer technique
A1B2 : Teaching EFL writing class of low proficiency learners using paper graphic organizer technique
A1B3 : Teaching EFL writing class of low proficiency learners using free writing technique
A2B1 : Teaching EFL writing class of moderate proficiency learners using digital graphic organizer technique
A2B2 : Teaching EFL writing class of moderate proficiency learners using paper graphic organizer technique
A2B3 : Teaching EFL writing class of moderate proficiency learners using free writing technique
A3B1 : Teaching EFL writing class of high proficiency learners using digital graphic organizer technique
A3B2 : Teaching EFL writing class of high proficiency learners using paper graphic organizer technique
A3B3 : Teaching EFL writing class of high proficiency learners using free writing technique

Procedure

The data were collected during the whole semester. The subjects were divided into three level of proficiency based on the pretest (low, moderate, and high proficiency learners). The three groups were taught using three models of teaching: digital graphic organizers (x1), paper graphic organizers(x2),free writing (x3). The instrument used to collect the data was a writing test. The data were analyzed using aone way Multivariate analysis of variance. The procedure of collecting and analysing data is illustrated in Figure 4.
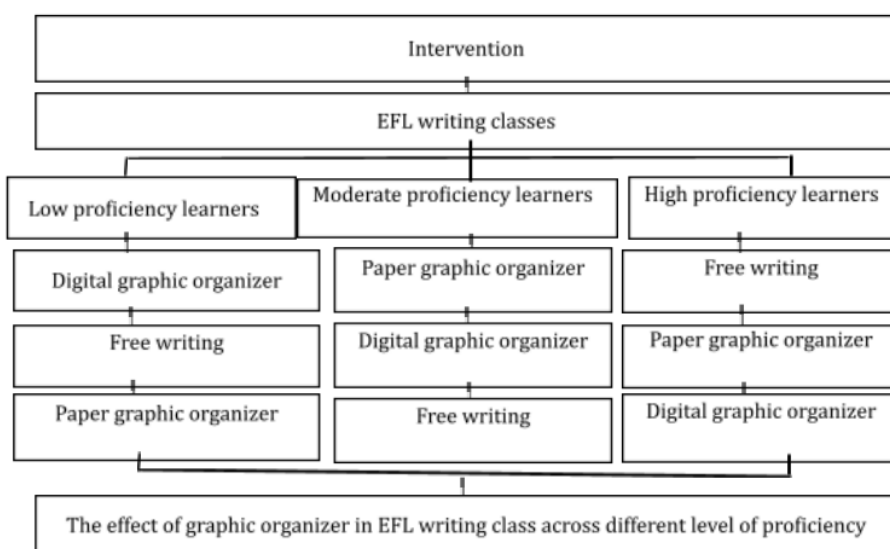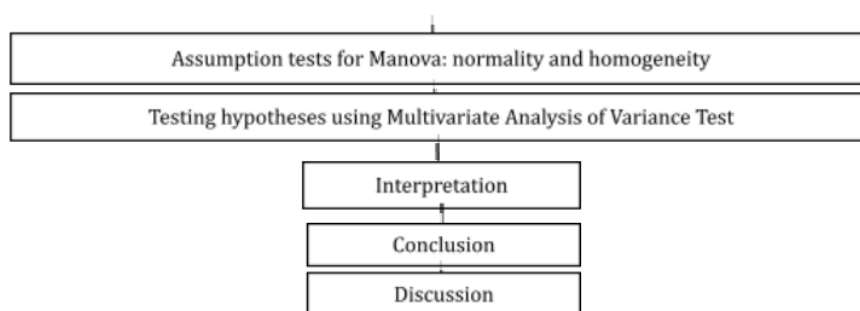
Figure 4. Data collection and analysis procedure

Finding
Data Presentation
This part dealt with result of each score, result of testing normality and homogeneity. The mean score for each course was described in Table 2.

Table 2. Descriptive Statistics

Outcome variables	Intervention	Mean	Std. Deviation	N
Low Proficiency learners	Digital Graphic Organizer (DGO)	66.8571	5.18663	14
	Paper Graphic Organizer (PGO)	66.5625	3.55844	16
	Free Writing (FW)	51.8000	6.47192	15
	Total	61.7333	8.72145	45
Moderate Proficiency	Digital Graphic Organizer (DGO)	77.2143	4.59395	14
	Paper Graphic Organizer (PGO)	71.4375	3.99948	16
	Free Writing (FW)	51.8000	6.57050	15
	Total	66.6889	12.01859	45
High Proficiency	Digital Graphic Organizer (DGO)	81.4286	5.28735	14
	Paper Graphic Organizer (PGO)	76.5625	4.14679	16
	Free Writing (FW)	52.2667	4.60538	15
	Total	69.9778	13.61231	45

The output indicated that the mean score for low learners using Digital Graphic Organizer (DGO) was 66.86, SD 5.19 (n=14); Paper Graphic Organizer (PGO) was 66.56, SD 3.56 (n=16); Free Writing (FW) 51.80, SD 6.47 (n=15). Then, the mean score for moderate learners using Digital Graphic Organizer (DGO) was 77.21, SD 4.59 (n=14); Paper Graphic Organizer (PGO) was 71.44, SD 3.99 (n=16); Free Writing (FW) 51.80, SD 6.57 (n=15). Next, the mean score for high learners using Digital Graphic Organizer (DGO) was 81.43, SD 5.29 (n=14); Paper Graphic Organizer (PGO) was 76.56, SD 4.15 (n=16); Free Writing (FW) 52.27, SD 4.61 (n=15).The data of the learners' score for each proficiency level was illustrated in Figure 5.
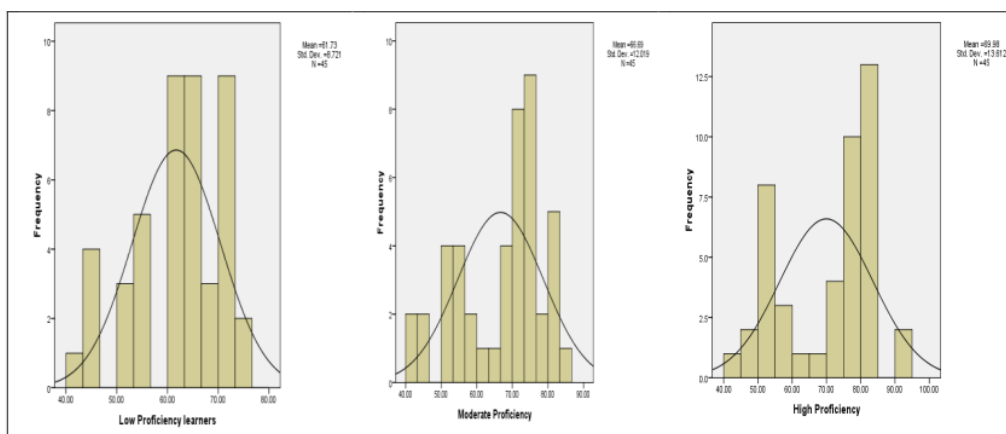
Figure 5. The learners' writing score for each proficiency level

Table 3. Tests of Normality

	Intervention	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Low Proficiency	Digital Graphic Organizer (DGO)	.156	14	.200*	.936	14	.367
	Paper Graphic Organizer (PGO)	.232	16	.021	.892	16	.060
	Free Writing (FW)	.148	15	.200*	.954	15	.588
Moderate Proficiency	Digital Graphic Organizer (DGO)	.185	14	.200*	.935	14	.363
	Paper Graphic Organizer (PGO)	.152	16	.200*	.961	16	.676
	Free Writing (FW)	.148	15	.200*	.949	15	.508
High Proficiency	Digital Graphic Organizer (DGO)	.179	14	.200*	.939	14	.410
	Paper Graphic Organizer (PGO)	.143	16	.200*	.900	16	.079
	Free Writing (FW)	.144	15	.200*	.978	15	.952

The Shapiro-Wilk output showed that the statistic value for low learners using Digital Graphic Organizer (DGO) was 0.936, p= 0.367; Paper Graphic Organizer (PGO)was 0.892, p = 0.060; Free Writing (FW) was 0.954, p = 0.588. Meanwhile, the statistic value for moderate learners using Digital Graphic Organizer (DGO) was 0.935, p = 0.363; Paper Graphic Organizer (PGO) was 0.961, p = 0.676; Free Writing (FW) was 0.949, p = 0.508. Then, the statistic value for high learners using Digital Graphic Organizer (DGO) was 0.939, p = 0.410; Paper Graphic Organizer (PGO) was 0.900, p = 0.079; Free Writing (FW) was 0.978, p = 0.952. Since, all p values were above 0.050, it was said that all data were in normal distribution. The normal distribution could also be seen in the QQ plot diagram below:
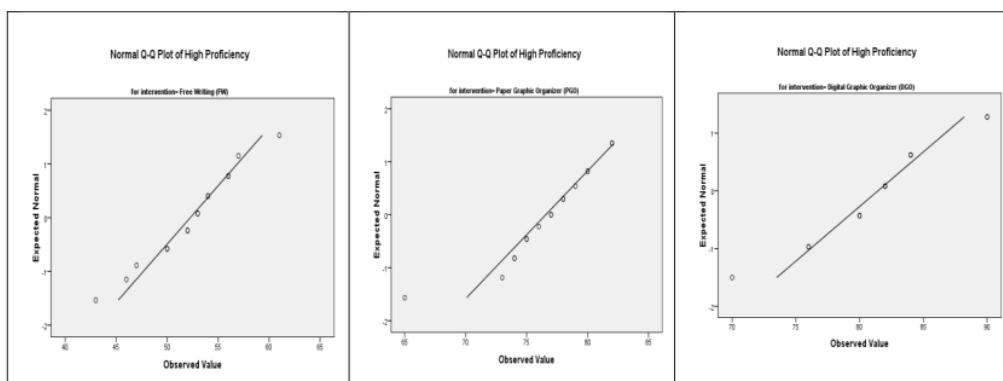
Figure 6. QQ plot diagram

Test Homogeneity
To test the homogeneity of variance, the levene's test of equality was counted, as illustrated in Table 5.

Table 4. Levene Test of Equality of Error Variances

	F	df1	df2	Sig.
Low Proficiency learners	2.376	2	42	.105
Moderate Proficiency	1.850	2	42	.170
High Proficiency	.260	2	42	.772

Levene's Test is used to examine whether or not the variance between predictor variable groups were equal. The out put stated that the F value of Low Proficiency Learners was 2.376, p = 0.105; F value of Moderate Proficiency Learners was 1.850, p = 0.170; F value of High Proficiency Learners was 0.260, p = 0.772. Since all p values were higher than 0.050, it was stated that all variables had the same varian or it did not violate the homogeneous, and Manova test was continued. If the Sig was higher than 0.050, the post hoc test using Benferroni test was applied, as seen the the following table.

Testing the homogeneity of matrices covariance.
To test the homogeneity of matrices covariance, Box's Test of Equality of Covariance Matriceswas applied, as explained in Table 5.

Table 5. Box's Test of Equality of Covariance Matrices

Box's M	18.891
F	1.409
df1	12
df2	8.299E3
Sig.	.153

The out put of box test was used to test the assumption of Manova. The out put indicated that the Box's M was 18.891, p = was 0.153. It meant that the observed covariance matrices of the outcome variables were equal.

Results
The Manova test was used to test the significant difference among the predictor variables toward some outcome variables. In the study, the predictor variable was the intervention consisting of Digital Graphic Organizer (DGO), Paper Graphic Organizer (PGO), and Free Writing (FW). Meanwhile, the outcome variable covers learners' writing score consisting of low level of proficiency learners, moderate level of proficiency learners, and high level of proficiency learners. The determination was taken based on Pillai's Trace, Wilks' Lambda, Hotelling's Trace,and Roy's Largest Root, as explained in Table 6.

Table 6. Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power
Intercept	Pillai's Trace	.996	3.511E3[a]	3.000	40.000	.000	.996	10532.324	1.000
	Wilks' Lambda	.004	3.511E3[a]	3.000	40.000	.000	.996	10532.324	1.000
	Hotelling's Trace	263.308	3.511E3[a]	3.000	40.000	.000	.996	10532.324	1.000
	Roy's Largest Root	263.308	3.511E3[a]	3.000	40.000	.000	.996	10532.324	1.000
intervention	Pillai's Trace	1.090	16.382	6.000	82.000	.000	.545	98.294	1.000
	Wilks' Lambda	.075	35.363[a]	6.000	80.000	.000	.726	212.179	1.000
	Hotelling's Trace	10.133	65.867	6.000	78.000	.000	.835	395.203	1.000
	Roy's Largest Root	9.911	1.354E2[c]	3.000	41.000	.000	.908	406.346	1.000

The out put indicated that the F values and the p-values for four different multivariate tests were Pillai's Trace (F= 16.382; p=0.000), Wilks' Lambda (F=35.363; p=0.000); Hotelling's Trace (F= 65.867; p=0.000),and Roy's Largest Root(F=1.354E2; p=0.000). The hypothesis was that there was a significant difference between interventions   toward all outcome variables. Since all p values were smaller than 0.050, it was said that there was a siginificant effect of intervention (Digital Graphic Organizer (DGO/x1), Paper Graphic Organizer (PGO/x2), and Free Writing (FW/x3)) toward all outcome variables learners' writing score (low level of proficiency learners/y1, moderate level of proficiency learners/y2, and high level of proficiency learners/y3.

Then, test between subjects effects showed the significant test univareately. It was used to know which variables caused the difference amongst the groups. The hypotheseswere: (a) there was no significant difference amongst intervention using graphic organizers in argumentative writing at the low level of writing proficiency learners. (b) There was no significant difference amongst intervention using graphic organizers in argumentative writing at the moderate level of writing proficiency learners. (c) There was no significant difference amongst intervention using graphic organizers in argumentative writing at the high level of writing proficiency learners. (d) There was nointeraction effect amongst intervention using graphic organizers in argumentative writing among the low, moderate and high level of writing proficiency learnersmultivariatelyas described in Table 7.

Table 7.Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power
Corrected Model	Low Proficiency	2220.748[a]	2	1110.374	41.415	.000	.664	82.830	1.000
	Moderate Proficiency	5236.950[c]	2	2618.475	98.307	.000	.824	196.615	1.000
	High Proficiency	7234.678[d]	2	3617.339	165.445	.000	.887	330.890	1.000
Intercept	Low Proficiency learners	171022.585	1	1.710E5	6.379E3	.000	.993	6.379E3	1.000
	Moderate Proficiency	200308.436	1	2.003E5	7.520E3	.000	.994	7.520E3	1.000
	High Proficiency	220385.672	1	2.204E5	1.008E4	.000	.996	1.008E4	1.000
intervention	Low Proficiency learners	2220.748	2	1110.374	41.415	.000	.664	82.830	1.000
	Moderate Proficiency	5236.950	2	2618.475	98.307	.000	.824	196.615	1.000
	High Proficiency	7234.678	2	3617.339	165.445	.000	.887	330.890	1.000
Error	Low Proficiency learners	1126.052	42	26.811					

	Moderate Proficiency	1118.695	42	26.636					
	High Proficiency	918.299	42	21.864					
Total	Low Proficiency learners	174842.000	45						
	Moderate Proficiency	206489.000	45						
	High Proficiency	228513.000	45						
Corrected Total	Low Proficiency learners	3346.800	44						
	Moderate Proficiency	6355.644	44						
	High Proficiency	8152.978	44						

The output above explained the effect of all predictor variables to outcome variable. Since, the sig. value of the corrected model was $0.000 < 0.050$ and F=41.415(low proficiency) 98.307(moderateproficiency), and 165.445(high proficiency), meaning that the model was valid to measure the effect among the variables. Then, p value of intercept was 0.000 and F=6.379E3(low proficiency) 7.520E3(moderate proficiency), and 1.008E4(high proficiency). It meant that the intercept was significant. The table also explained the model of test univariatly. The out put showed the effect of the intervention (X) to the low level proficiency of writing was (F= 41.415, p = 0.000, eta = 0.664) moderate level proficiency of writing (F= 98.307. p = 0 .000, eta = 0.824); and high level proficiency of writing(F= 165.445, p = 0.000, eta= 0.887). Since all p values sig for each level proficiency of writingwas 0.000 or less than 0.05, it meant that the intervention (DGO, PGO and FW) gave significant effect for all level proficiency of writing (low, moderate, high). It meant that there was a significance effect on the learners' writing score of alllevel proficiency caused by the different intervention. It was said that the intervention (Digital Graphic Organizer (DGO/x1), Paper Graphic Organizer (PGO/x2), and Free Writing (FW/x3)) gave significant effect for all outcome variables learners' writing score of (low level of proficiency learners/y1, moderate level of proficiency learners/y2, and high level of proficiency learners/y3). The next step was to find the mean score for each level and the intervention as explained in Table 8.

Table 8. Intervention

Dependent Variable	Intervention	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Low Proficiency	Digital Graphic Organizer (DGO)	66.857	1.384	64.064	69.650
	Paper Graphic Organizer (PGO)	66.562	1.294	63.950	69.175
	Free Writing (FW)	51.800	1.337	49.102	54.498
Moderate Proficiency	Digital Graphic Organizer (DGO)	77.214	1.379	74.431	79.998
	Paper Graphic Organizer (PGO)	71.438	1.290	68.834	74.041
	Free Writing (FW)	51.800	1.333	49.111	54.489
High Proficiency	Digital Graphic Organizer (DGO)	81.429	1.250	78.907	83.951
	Paper Graphic Organizer (PGO)	76.562	1.169	74.203	78.922
	Free Writing (FW)	52.267	1.207	49.830	54.703

The table demonstrated that the low proficiency learners' writing mean score using Digital Graphic Organizer (DGO) was 66.857, SE 1.384; Paper Graphic Organizer (PGO) was 66.562, SE1.294; and Free Writing (FW) was 51.800, SE1.337. Meanwhile, moderate proficiency learners' writing mean score using Digital Graphic Organizer (DGO) was 77.214, SE 1.379; Paper Graphic Organizer (PGO) was71.438 , SE 1.290; and Free Writing (FW) was 51.800, SE 1.333. Then, high proficiency learners' writing mean score using Digital Graphic Organizer (DGO) was 81.429, SE 1.250; Paper Graphic Organizer (PGO) was 76.562, SE 1.169; and Free Writing (FW) was 52.267, SE 1.207. Based on the out put above, it was said that it was said that both Digital

Graphic Organizer (DGO) and Paper Graphic Organizer (PGO) were appropriate technique to teach writing class for all proficiency levelas explained in Table 9.

Table 9. Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Intervention	(J) Intervention	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Low Proficiency learners	Digital Graphic Organizer (DGO)	Paper Graphic Organizer (PGO)	.2946	1.89492	.987	-4.3091	4.8983
		Free Writing (FW)	15.0571*	1.92417	.000	10.3824	19.7319
	Paper Graphic Organizer (PGO)	Digital Graphic Organizer (DGO)	-.2946	1.89492	.987	-4.8983	4.3091
		Free Writing (FW)	14.7625*	1.86093	.000	10.2414	19.2836
	Free Writing (FW)	Digital Graphic Organizer (DGO)	-15.0571*	1.92417	.000	-19.7319	-10.3824
		Paper Graphic Organizer (PGO)	-14.7625*	1.86093	.000	-19.2836	-10.2414
Moderate Proficiency	Digital Graphic Organizer (DGO)	Paper Graphic Organizer (PGO)	5.7768*	1.88872	.011	1.1882	10.3654
		Free Writing (FW)	25.4143*	1.91788	.000	20.7548	30.0738
	Paper Graphic Organizer (PGO)	Digital Graphic Organizer (DGO)	-5.7768*	1.88872	.011	-10.3654	-1.1882
		Free Writing (FW)	19.6375*	1.85484	.000	15.1312	24.1438
	Free Writing (FW)	Digital Graphic Organizer (DGO)	-25.4143*	1.91788	.000	-30.0738	-20.7548
		Paper Graphic Organizer (PGO)	-19.6375*	1.85484	.000	-24.1438	-15.1312
High Proficiency	Digital Graphic Organizer (DGO)	Paper Graphic Organizer (PGO)	4.8661*	1.71121	.018	.7087	9.0235
		Free Writing (FW)	29.1619*	1.73763	.000	24.9403	33.3835
	Paper Graphic Organizer (PGO)	Digital Graphic Organizer (DGO)	-4.8661*	1.71121	.018	-9.0235	-.7087
		Free Writing (FW)	24.2958*	1.68052	.000	20.2130	28.3786
	Free Writing (FW)	Digital Graphic Organizer (DGO)	-29.1619*	1.73763	.000	-33.3835	-24.9403
		Paper Graphic Organizer (PGO)	-24.2958*	1.68052	.000	-28.3786	-20.2130

The analysis multivariate variance was used to test the difference of more than one predictor variables toward more than one outcome variables. In the study, the predictor variable was the teaching intervention consisting of Digital Graphic Organizer (DGO), Paper Graphic Organizer (PGO), and Free Writing (FW). Meanwhile, the outcome variables coveredlow proficiency learners' writingscore; moderate proficiency learners' writing score; and was Paper Graphic Organizer (PGO); and to the high proficiency learners' writingscore.
The output demonstrated that:

1   the difference on low proficiency writing score, based on the intervention, the technique which had significance difference was Digital Graphic Organizer (DGO) and Free Writing (FW) (Mean difference 15.0571, p=0.000) and Paper Graphic Organizer (PGO) and Free Writing (FW)(Mean difference 14.7625, p=0.000).Meanwhile, Digital Graphic Organizer (DGO) and Paper Graphic Organizer (PGO) were not significant (MD 0.2946, p=0 .987).

2   the difference on moderate proficiency writing score , based on the intervention, the technique which had significance difference was Digital Graphic Organizer (DGO) and Paper Graphic Organizer (PGO) (Mean

difference 5.7768, p=0.018); Digital Graphic Organizer (DGO) and Free Writing (FW) (Mean difference 25.4143, p=0.000).

3   The difference on high proficiency writing score , based on the intervention, the technique which had significance difference was Digital Graphic Organizer (DGO) and Paper Graphic Organizer (PGO) (Mean difference 4.8661 p=0.018); Digital Graphic Organizer (DGO) and Free Writing (FW) (Mean difference 29.1619, p=0.000). Paper Graphic Organizer (PGO) and Free Writing (FW) (Mean difference 24.2958, p=0.000).

To sum up, both Digital Graphic Organizer (DGO) Paper Graphic Organizer (PGO) and Free Writing (FW) were appropriate technique to teach writing class for all proficiency level. The table above demonstrated that for writing mean scores for each level were statistically significantly different between was Digital Graphic Organizer (DGO), Paper Graphic Organizer (PGO) and Free Writing (FW). These differences can be easily seen in the plot below.
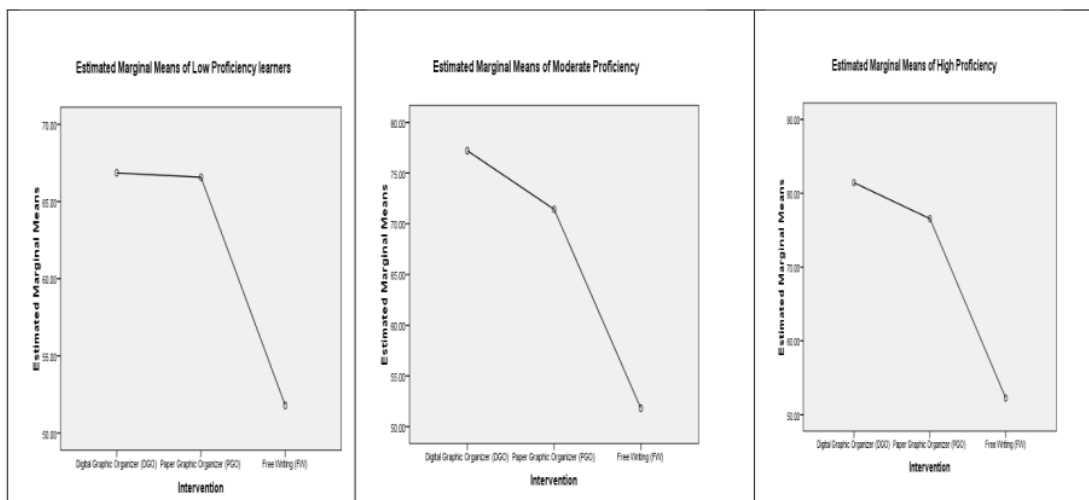
Figure 7. The plot diagram of interventions

To sum up, One-way MANOVA was used to measure if there was a difference between conducted to determine whether there is a difference amongst Digital Graphic Organizer (DGO), Paper Graphic Organizer (PGO) and Free Writing (FW) in writing test score (low proficiency learners, moderate proficiency learners and high proficiency learners). There was a significant difference effect between teacher's interventions (Digital Graphic Organizer (DGO), Paper Graphic Organizer (PGO) and Free Writing (FW)) on the learners' writing test scores (low, moderate, and high level of proficiency), F (2, 45) = 0.075, p = 0.000; Wilk's lambda = 35.363, partial eta squared = 0.726. Moreover, a significant difference effect of intervention occurred on low level of proficiency learners in writing test score, F (2, 45) = 41.415, p = 0.000, partial eta squared 0.664; there was a significant difference effect of intervention on moderate level of proficiency learners in writing test score, F (2, 45) = 98.307, p = 0.000, partial eta squared 0.824; there was a significant difference effect of intervention on high level of proficiency learners in writing test score, F (2, 45) = 165.445, p = 0.000, partial eta squared 0.887. The study accepted the alternative hypothesis stating that there was an interaction effect amongst intervention using graphic organizers in argumentative writing at the low, moderate and high level of writing proficiency learners. The study accepted the *ho* stating that there were no interaction effect amongst intervention using graphic organizers in argumentative writing at the low, moderate and high level of writing proficiency learners. Based on the finding, the most appropriate technique was Digital Graphic Organizer (DGO), followed by Paper Graphic Organizer (PGO) and Free Writing (FW) to all level of learners' proficiency writing.

Discussion

 The result revealed that a significant difference effect occurred between teacher's interventions (Digital Graphic Organizer (DGO), Paper Graphic Organizer (PGO) and Free Writing (FW)) on the learners' writing test scores (low, moderate, and high level of proficiency), F (2, 45) = 0.075, p = 0.000; Wilk's lambda = 35.363, partial eta squared = 0.726. It meant that the intervention of Digital Graphic Organizer (DGO), Paper Graphic

Organizer (PGO) and Free Writing (FW)) gave facilitative effect to the learners' writing test scores (low, moderate, and high level of proficiency) at higher education. The finding was in accordance with some previous studies. For example, Unzueta and Barbetta (2012) found that GOs can help the overall organization of the learners' compositions. Next, Meera and Aiswarya (2014) demonstrated that GO improved writing skills in writing argumentative essay. Then, Mahmudah (2016) revealed that GO through via scaffold actions developed both the learners' writing skills and learning motivation as well. Next, Maad and Maniam (2017) found that there was an increase in the experimental group. Then, Hamiche (2017) revealed that the GO is an effective technique for writing argumentative essay. The finding was also supported by Muniandy& Ram(2011);Styati&Latief, (2018); Spawa& Hassan (2013); Mohamed (2016); Bipinchandra et al. (2014);Ponnudurai (2011);Tayib (2015); (Hussin, 2008); French & Kennedy, (2016); Zakrajsek (2018), Elhawwa, et.al. (2019), Sabarun, et.al. (2020); Mann (2009); Tomlison, 2012); Faull (2007); Zaini, Mokhtar, &Nawawi, (2010). Lancaster, K (2013), Chien, C, W. (2012), Ibnian (2010) Mercuri (2010), and LiouHsien Chin (2014); Jiang and Grabe (2007); Shoari (2012); Ellis (2004); Miller (2011).

The finding also supported Ellis' theory (2004) stating that that there were three advantages of GOs. First, learners could select the necessary data relating to the topic. For instance, they could classify data for writing into: thesis, arguments, and suggestion related to the topic. Second, learners could enjoy and addressthematerialatmorejoyful. It could be examined from the learners' skills to create their GOs and write the argumentative essay. Third, learners became strategic learners. It could be observed from the classroom interaction. They were motivated to learn writing argumentative essay, present their writing product and they were eager to practice writing. The finding also confirmed that the use of GOs could improve the learners' development of argumentative writing skills and cognitive skills. Learners could easily plan the ideas using GOs and write argumentative essaysmoothly, including stating the thesis statement, giving evidences, claim, counterclaim and concluding the essay.

Declarations

The data are provided on reasonable request.

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