The Effectiveness of Geographic Literacy based Model of Social Studies Learning in Building Eco-friendly Character

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Abstract: This study aimed at testing the effectiveness of geographic literacy based model of social studies learning in building eco-friendly character of the students at junior high school level in Bandung. The method used in this study was Quasi Experiment. Quasi experimental design is The Pretest-Posttest Control Group Design. The population of the study was all students at junior high school level in Bandung while the Samples were defined through Cluster Random Sampling/Multiple Stage Area Sampling. The number of clusters used was 4 (54 Schools). The effectiveness test towards the model shows that the implementation of the geo-literacy based teaching model in building eco-friendly character or BLG-KPL Model gives a significant influence (effective) in building eco-friendly character. The effect size of the participation aspect of the model was 0.729 and that of the knowledge aspect was 0.622731 classified as moderate. It means that the model gives a relatively big influence to the building of eco-friendly character. However, the effect size of the attitude aspect was 1.045891 classified as high, which means that the model gives a big influence to the building of eco-friendly character. The significance of this study is important in order to give an alternative model in social studies learning that can be used as an effort in building student's eco-friendly character while there were only a few models specified for building eco-friendly character. Furthermore, this study was also a supplementary study of the previous study on the importance of the efforts in building eco-friendly character in school subjects, particularly in social studies.

1 INTRODUCTION

Modernity brings a state to a higher development. In the planning stage, development may at all times involve either human resources or natural resources. The use of natural resources gives a big contribution yet it decreases the environmental support and depletes the natural resource.

Resource exploitation as an impact of modernism derives from conventional thought that sets human beings as the main actors of the history (anthropocentrism), i.e. within the long history of human beings (Supriatna, 2016). Anthropocentrism considers human beings as the center of the space system. Keraf (2010) explains that this theory takes human beings and their interests as the determining factors in ecosystem management as well as in all policies taken related to the nature, either direct or indirect. The determining factors in this theory are human beings and all of their interests. Everything happens in the nature was previously taken for granted unless it could be used to support and for human's interest. Consequently, nature is only seen as an object, i.e. as the tool and medium to fulfill human's interests.

Anthropocentrism sees that humans exploit the nature to fulfill their interests and needs. However, they do not give some serious attention towards the nature. Keraf (2010) explains that humans' exploitative, destructive and careless natures towards environment are thought to be derived from their framework to only focus on human's interests that leads to greediness, leading them to take all of their needs from the nature without considering its sustainability (the nature exists only for humans).

Humans' awareness to always pay attention to the environment as a part of environmental ethics should still be developed, by converting the conventional framework of anthropocentrism to a more proper framework. Humans should understand that they are created to be a leader (*khalifah*) who manages different things on earth,

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either plants, animals, land, water, air, mountain, forest, or any other thing on earth to be managed and to be used by them sensibly and sustainably.

Capra (1997) proposes a more appropriate framework in facing the conventional framework, i.e. by using a new holistic and ecological formula formed in new scientific language which depicts different concepts in psychological, biological, physical, social, cultural, and living system phenomena called as the web of life. The core idea of the comprehensively systematic concept of life is that the basic pattern of the organization of life is web. In all level of life, either the metabolism web in a cell, the food web in an ecosystem, or the social communication web belongs to the components of life system interconnected within a web. The concept considers particular elements of all species where all of the elements are integrated, and mutually dependent. There should not be a dominant element, all are mutually dependent. When an element is in trouble, the other elements may also be disturbed.

One of the important aspects in education is an ability to make students realize that they (the students) belong to the society that is able to make decisions of which the impact is wide in scope, each day. Each decision will generate some impacts going beyond the time and place when and where the decision is made. For example, decision not to throw garbage into a river, to use public transportation instead of using private vehicles or other ones that may have a wide impact.

The concept pertaining to the interrelatedness of one place to other places as well as environmental management which belongs to geographic literation, which will also build eco-friendly character, should always be delivered in social studies learning. Considering that one of the objectives of social studies curriculum is to equip students with some awareness towards positive mental attitude and skills pertaining to the environment which has been a part of their lives. Therefore, social studies should be focused on building eco-friendly character. Social studies learning is not only aimed at building cognitive ability but also at developing attitude, values, and skills, which can build eco-friendly character that will be their way of thought and act and make them different in the way they live their life in family, school, society, and country as one of the answers for modernization.

Social studies learning should become one of the appropriate media to build eco-friendly character. Supriatna (2016) states that social studies should be integrated, value-based, problem-based and contextual. To build eco-friendly character in social studies learning requires a meaningful teaching. Teaching learning process will be meaningful if the students realize that the subject materials studied by them are useful for them in living their life. Social studies teachers, in geographic literacy-based model of social studies learning, can take some initiatives and play a role in facilitating students as a part of eco-friendly society. This study is aimed at testing the effectiveness of geographic literacy based model of social studies learning to build eco-friendly character (BLG-KPL Model) of students at junior high school level in Bandung.

2 LITERATURE REVIEW

2.1 The Essence of Geographic Literacy

The Geographic literacy is often abbreviated as geo-literacy. There are different definitions of geographic literacy delivered by experts. It shows that there has not been any agreement among geography experts on this. One of the experts defines geographic literacy as an ability in finding a certain places on a map so called as place location knowledge (PLK) since PLK is the root of/basis in geographic study (Torrens, 2001; Saarinen and MacCabe, 1995; Marran, 1992; Hise, et al, 2000; Donovan, 1993).

National Geographic (1994) defines geographic literacy as an ability to use geographic knowledge and reasoning to make decision. This term is initially proposed by National Geographic (1994) where the organization has been declared as one of the media supporting the efforts in delivering the concept of geographic literacy to the public.

Pattison (1964) in Kerski (2015) defines geographic literacy as four popular concepts that have become the basis in geography including space, territory, human-land, and geology. Researchers from two geographic associations (Natoli, et al.,1984) in Kerski (2015) identify that geographic literacy involves "identified five themes—movement, region, human-environment interaction, location, and place". Different from Edelson (2012) in Kerski (2015), however, he "Stated that it should include how our world works, how our world is connected, and how to make well-reasoned decisions, or interactions, interconnections, and implications. I believe that geoliteracy requires cultivation in each of what I consider to be the essential "three legs" of the stool of geographic

literacy: (i) core content, (ii) skills in using geographic tools, and (iii) the geographic perspective (Kerski, 2015).

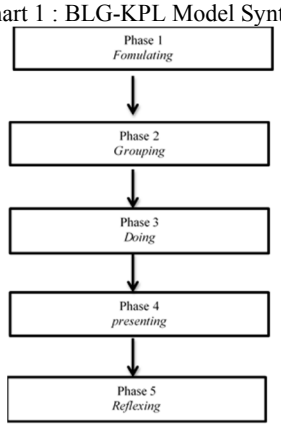
Edelson tends to cover all related to how our worlds work (interaction) how our worlds connect (interconnection) and how the interaction and interconnection determine an impact caused by an act (implication) or so called interaction, interconnection, and implication as in how to decide a living place or how to prevent natural disaster. In reference to this definition, geographic literacy is comprised by the 3 components of : 1) Interaction: how the world works; 2) Interconnection: How the world is connected; 3) Implication: How the interaction and interconnection determine an impact of an act.

Geographic literacy in this study takes some definitions adapted from Henry (1994) and Edelson (2012), i.e. description of the ability to express basic geographic knowledge, including that of (i) location, (ii) interrelationship between human beings and environment, and (iii) land management (environmental management). Therefore, Geographic Literacy Based Learning in this study refers to the teaching learning process that involves determination of a location on map, explanation on the interrelation of human beings and environment, as well as ecology/environment management implemented through recycling process.

Table 1: Geographic Literacy Based Learning

Variable	Indicators	Sub indicators	Instrument
Geographic Literacy	Determination of a location	The teaching learning process that involves determination of a location on map	Using maps in learning
	Interrelation of human beings and environment	Explanation on the interrelation of human beings and environment	Testing and group worksheet
	Ecology/environment management	Implemented through recycling process	Making craft and art

Chart 1 : BLG-KPL Model Syntax



2.2 Eco-friendly Character

Building eco-friendly character should be started with the awareness that Earth is the only One Planet that should be saved from any destruction and from the eco-friendly actions from a small step to save our planet (Putrawan, 2014). Eco-friendly character will be able to be one of the solutions for the dilemma in fulfilling human's basic needs that grow fast. The fastest way to fulfill some dilemmatic human's needs is through industrialization while in fact many industries are not reliable in terms of waste control that negatively affects the environment and natural resource sustainability, resulted from pollution, limited water stock, and global climate change (Putrawan, 2014).

The character values related to the environment is eco-friendly character. Keraf explains in his book (Keraf, 2010) that eco-friendly character is an act and attitude that always try to prevent environmental destruction and to restore it, if there is any.

The awareness and care given by human beings towards environment cannot grow naturally as they are yet they should be managed so that they may continuously grow from the early age, through some real activities that close with their daily life. In order to build eco-friendly character, the most strategic way is through education, either formal or non-formal.

Education is the most important part in widely increasing public awareness in order to strengthen the attitude, values and actions aimed at building the eco-friendly character. The efforts managed through education can bring some awareness that the root of any environmental destruction is not the economy, politic, social, and culture, but it is the human's attitude that motivates some irrational decision. It is as has been written in Koran, Surah Ar Rum (30) verse 41 translated to be "Evil (sins and

disobedience to Allah) has appeared on land and sea because of what the hands of men have earned (by oppression and evil deeds), that He (Allah) may make them taste a part of that which they have done, in order that they may return (by repenting to Allah, and begging His Pardon)".

Masruri, et. al. (2002) explains that the environmental destruction which turns into some global issue involves some destruction in forest and land, water pollution, either under the ground or under the sea, water pollution, air pollution, ozone layer depletion, greenhouse effect, acid rain, noise, biodiversity decline, diseases caused by and spread in unhealthy environment.

The environmental destruction makes some education through teaching and learning process one of the media that can be used to build eco-friendly character. The objectives in building eco-friendly character are : 1) Encouraging students' noble habit and behavior which are in line with the proper environmental management; 2) Improving students' ability to prevent the characters that can harm the environment; 3) Building students' awareness towards environmental condition so that it can prevent the characters that may harm the environment; 4) Building students' eco-friendly character as well as the responsibilities towards the environmental sustainability.

Environmental ethic principles implemented in geo-literacy based model of social studies learning are comprised by : (1) the principle to respect environment, (2) responsibility principle, (3) solidarity principle, (4) loving and care principle, (5) principle not to destroy anything, (6) principle to live humbly and be harmony with nature, (7) justice principle, (8) democratic principle, and (9) moral integrity principle.

Eco-friendly character belongs to the 18 values of state character education issued by Pusat Kurikulum, Pengembangan dan Pendidikan Budaya & Karakter Bangsa called as The Center of Curriculum, Development and Education of the State Culture and Character (Pedoman Sekolah, Pusat Kurikulum, 2006). Eco-friendly character is an attitude in interacting to understand, feel and act towards an object. As a social creature, human beings cannot be separated from the environment. Eco-friendly character in this study refers positive attitude in preserving and maintaining the environmental quality and sustainability. Eco-friendly behavior is an ability to make some choices on how to act and respond based on his/her heart. This character shows a positive attitude in caring for and maintaining the environmental quality and sustainability.

Narwanti (2011) defines eco-friendly as the attitude and act in trying to prevent any environmental destruction as well as developing some efforts to restore them, if any. Therefore, one who has the character should have some attitudes willing to restore and manage environment properly that give some beneficial influence so that the environment can be used continuously without causing any damages, as well as to maintain and preserve the environment that may lead to sustainable benefit.

Eco-friendly character in this study is derived from Keraf (2010) stating that eco-friendly character is an attitude and act trying to prevent environmental destruction and developing some effort to restore them. The indicators are, (1) habituation in maintaining the sanitation, (2) no violation towards class inventory (scratches on desks and wall), and (3) the use of the used materials.

Table 2: Eco-friendly Character Indicators

Variables	Indicators	Subindicators	Instrument
Eco-friendly Character	Habituation in maintaining the sanitation	a. Know the importance of environmental care (knowledge) b. Response and thoughts on environmental issues (attitude) c. Respect for the environment (attitude) d. Throw garbage in its place (participation-performance) e. Stepping on a friend to preserve the environment (participation-performance) f. Engage in environmental preservation (participatio	Test, Group work sheet, Questionnaire and Observation Sheet

		n-performance)	
	No violation towards class inventory (scratches on desks and wall)	a. Appreciation and care for class inventory (attitude) b. Do not scribble the classroom tables and walls (participation-performance)	Questionnaire and Observation Sheet (performance appraisal)
	The use of the used materials	a. Understanding the notion of utilizing used goods (knowledge) b. Carry out activities to preserve the environment-recycling (performance participation) c. Skills on using and using used goods (participation-performance) d. Creating work (craft and art) from used goods (participation-performance)	Test, Group work sheet, Questionnaire and Observation Sheet (performance appraisal)

3 METHODOLOGY

This study used quantitative approach with Quasi Experimental method. The quasi experimental design is The Pretest-Posttest Control Group Design.

Table 3: The Pretest-Posttest Control Group Design

Group	*Pretes*	*Treatment*	*Posttest*
A	O1	X1	O2
B	O3		O4

Remarks:
A : Experimental Group with BLG-KPL Model (VIII-A)
B : Control Group, the implementation of Cooperative Model with Think Pair Square/TPS (VIII-F)
O1 and O3 : Pre-test
O2 and O4 : Posttest
X1: Treatment with BLG-KPL Model

This design was chosen to find the difference between the mean score of eco-friendly character of experimental group using BLG-KPL Model and that of the control group. The variables of this study were: (1) geo-literacy based social studies teaching and (2) eco-friendly character. The geo-literacy based Model of Social Studies Learning is the model which involves some determination towards locations on map, interrelation between human beings and the nature (environment) as well as environmental management related to the social study materials to teach. Eco-friendly character that belongs to dependent variable has 3 indicators of habituation in maintaining sanitation, no violation towards class inventory (making some scratches on desks and wall) and the use of unused items.

This study was conducted in Bandung while the subjects were teachers and students at junior high school level in the city. Data were collected through written test, group worksheet (knowledge aspect), attitude observation sheet (attitude aspect) and performance assessment sheet (aspect of participation-skill). Samples were determined through Cluster Random Sampling/Multiple Stage Area Sampling. The number of clusters used was 4 (54 schools).

Data were analyzed by comparing the mean score of eco-friendly character of experimental group to the one of the control group, i.e. by comparing the score before and after the treatment. The procedure was started by drawing a score table of students' pretest and posttest in experimental and control group. It was followed by the calculation towards the improvement of the score before and after the implementation of the model (gain). It was then followed by normality test and homogeneity test towards pretest, posttest and gain. After the scores met the normality requirements and they were

homogeny, it was followed by the test on the mean of pretest score and by the test on the difference between the means of pretest and posttest after the treatment as well as the test on the difference in gain scores between the two groups (experimental and control group) by using t-test, one way anova and independent sample t test. It was then followed by the calculation towards effect size. The effect size for the t test used Cohen's d formulation (Santoso, 2010).

4 RESULT OF STUDY

4.1 The Initial Condition of Eco-friendly Character of the Experimental and Control Group

4.1.1 The Initial Condition of the Participation-Performance Aspect of Eco-friendly Character of the Experimental and Control Group

The calculation shows that sig. as the result of the test on the mean score of the participation-performance aspect of eco-friendly character between the experimental group and control group was 0.147 (higher than 0.05) which means that there was no difference in the mean score of the participation aspect of eco-friendly character within the two groups (experimental and control).

4.1.2 The Initial Condition of the Attitude Aspect of Eco-friendly Character of the Experimental and Control Group

The calculation shows that sig. as the result of the test on the mean score of the attitude aspect of eco-friendly character between the experimental and control group was 0.932 (higher than 0.05) which means that there was no difference in the mean score of the attitude aspect of eco-friendly character within the two groups (experimental and control).

4.1.3 The Initial Condition of the Knowledge Aspect of Eco-friendly Character of the Experimental and Control Group

The calculation shows that sig. as the result of test on the mean score of the knowledge aspect of eco-friendly character between the two groups of experimental and control was 0.981 (higher than 0.05) which means that there was no difference in the mean score of the knowledge aspect eco-friendly character within the two groups (experimental and control)

In general, the initial condition of the participation, attitude and knowledge aspects of eco-friendly character of the experimental and control groups is as follow:

Table 4: The Initial Condition of Eco-Friendly Character of the Experimental and Control Group

Aspect	Preliminary Condition (*Pretest*)		Significance	Remarks
	Experimental	Control		
Participation-Performance	63.66	65.13	0.147> 0.05	No difference
Attitude	69.11	69.18	0.932> 0.05	No difference
Knowledge	73.00	73.03	0.981> 0.05	No difference

Source : Calculation towards Primary Data, 2016

Table 4 describes the previous table showing that the students' scores in the aspect of participation, attitude and knowledge aspects of eco-friendly character, i.e. between the experimental and control group, were not significantly different (sig score >0.05). The sig. score shows that in the initial condition (before the implementation of the model), the scores of the experimental and control groups in the participation, attitude and knowledge aspects were identical.

4.2 The Result of the Test on the Difference in the Gain Scores of the Experimental and Control Groups

After the tests towards all of the data, which also belong to the effectiveness tests, it is known that the scores after the treatment (The Result of the Test towards the Participation, Attitude and Knowledge Aspects of Eco-Friendly Character of the Experimental and Control Groups after the Treatment) were significantly different. Having the interaction, the test was then followed by the differential test to compare the difference between the posttest score (after the treatment) and the pretest score (before the treatment) called as gain sore/ different score or gain. The test used was independent sample t-test.

4.2.1 The Test on the Difference in the Gain Scores of the Participation-Performance Aspect of the Experimental and Control Groups

Similar to the previous test, the test on the difference in the gain scores of the two groups was conducted after the gain scores of the two groups had passed the normality test. After the normality test had been accomplished and the gain scores of the two groups were stated to be normally distributed, the process should have been followed by independent sample t-test. The analysis result is as follow:

Table 5: Group Statistics of the Gain Mean of the Participation Aspect of the Experimental and Control Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Gain	Exprimental	38	4.63	6.651	1.079
	Control	38	.26	5.264	.854

Table 5 shows that the experimental group (Mean/M=4.63) had a higher difference compared to that of the control group (Mean/M=0.26).

Table 6: Independent Sample Test of the Gain of the Participation Aspect of the Experimental and Control Groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	f	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Gain	Equal variances assumed	1.550	217	3.175	4	002	4.368	1.376	.627	.110
	Equal variances not assumed			3.175	0.292	002	4.368	1.376	.624	.113

The statistical analysis shows that the data of the two groups were derived from the same variance/homogeny (F=1.550; >0.05). Furthermore, from the Equal Variances Assumed column, it can be seen that there was difference in (sig: p=0.002 <0.05) in the level of sig.5% which means that the experimental group had a significant difference compared to the control group. Therefore, the treatment using BLG-KPL Model in the experimental group is stated to be successful.

The procedure was then continued to the calculation of the effect size of the model. Effect size describes how big the effect of the model is in order to build the participation aspect of eco-friendly character of the experimental group, which may also show how far the effectiveness of the treatment offered by the model is. Effect size can be calculated by using Cohen's d coefficient. The calculation on the effect size shows that the effect size of the treatment using the model in order to build the participation aspect of eco-friendly character of the experimental group was 0.729 which can be interpreted as moderate in Cohen's classification.

4.2.2 The Test on the Difference in the Gain Scores of the Attitude Aspect of the Experimental and Control Groups

The test on the difference in the gain score of the attitude aspect of the two groups was conducted after the gain scores of the two groups are normally distributed. After the gain scores of the two groups were stated to be normally distributed, the process was continued by the independent sample t-test. The analysis result, however, is as follow:

Table 7: Group Statistics of the Gain Mean of the Attitude Aspect of the Experimental and Control Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Gain	Experimental	38	11.82	5.685	.922
	Control	38	4.92	6.679	1.084

Table 7 shows that the experimental group (Mean/M=11.82) had a higher difference compared to that of the control group (Mean/M=4.92).

Table 8: Independent Samples Test of the Gain of the Attitude Aspect of the Experimental and Control Groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Gain	Equal variances assumed	1.142	.289	.846	74	.000	6.895	1.423	4.060	9.730
	Equal variances not assumes			.846	72.156	.000	6.895	1.423	4.058	9.731

The statistical analysis shows that the data of the two groups were derived from the same variance/homogeny (F=1.142; >0.05). Furthermore, from the Equal Variances Assumed column, it can be seen that there was difference in (sig: p=0.000 <0.05) in the level of sig. 5% which means that the experimental group had a significant difference compared to the control group. Therefore, the treatment using the model in the experimental group is stated to be successful.

The process was then continued to the calculation of effect size of the model. Effect size describes how big the effect of the treatment offered by the model is in order to build the attitude aspect of eco-friendly character of the experimental group which also shows how far the effectiveness of the treatment using the model is. Effect size can be calculated using Cohen's d coefficient. The calculation towards effect size shows that the effect size of the treatment using the model in order to build attitude aspect of eco-friendly character of the experimental group was 1. 045891, which can be interpreted as big in Cohen's classification.

4.2.3 The Test on the Difference in the Gain Scores of the Knowledge Aspect of the Experimental and Control Groups

The test on the difference in the gain scores of the knowledge aspect of the two groups was conducted after the gain scores of the two groups were normally distributed. After the gain scores of the two groups were stated to be normally distributed, the process was continued to the independent samples t-test. The analysis result, however, is as follow:

Table 9: Group Statistics of the Gain Mean of the Knowledge Aspect of Experimental and Control Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Gain	Experimental	38	6.61	5.889	.955
	Control	38	2.89	6.057	.983

Table 9 shows that the experimental group (Mean/M=6.61) had a higher difference compared to that of the control group (Mean/M=2.89).

Table 10: Independent Samples Test of the Gain of the Knowledge Aspect of the Experimental and Control Groups

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	f	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Gain	Equal variances assumed	.059	809	.856	74	.006	3.895	1.364	.177	6.612
	Equal variances not assumed			.856	3.678	.006	3.895	1.364	.177	6.612

The statistical analysis shows that the data of the two groups were derived from the same variance/homogeny (F=0.059; >0.05). Furthermore, from Equal Variances Assumed column, it can be seen that there was difference in (sig: p=0.006 <0.05) in the level of sig. 5% which means that the experimental group had a significant difference compared to the control group. Therefore, the treatment using the model in the experimental group is stated to be successful.

The process was then continued to the calculation of effect size of the model. Effect size describes how big the effect of the model is in order to build the knowledge aspect of eco-friendly character of the experimental group which may also show the effectiveness of the treatment using the model. Effect size can be calculated using Cohen's d coefficient. The effect size of the treatment using the model to build the knowledge aspect of eco-friendly character of the experimental group was 0. 622741, which can be interpreted that it had moderate effect size in Cohen's classification.

5 CONCLUSIONS

BLG-KPL model gives some space to the students to build eco-friendly character under the social study principles so that they have some awareness towards the environment and others (other students). The effectiveness test shows that the implementation of the model in social studies in junior high school level gives a significant influence in building eco-friendly character. This study supports previous studies on geographic literacy (Novarlia, 2013), and the establishment of the values in eco-friendly character (Puspitasari, 2016; Handayani, 2013; Schusler and Krasny, 2010; and Sumarlin, 2012). It is the teaching learning process offered by the teacher through the implementation of BLG-KPL Model that Skinner defines as the process to change one's behavior. These changes in behavior can be reached through some reinforcement towards some particular responses, through some proper stimuli. Therefore, the key to understand most of the behaviors or actions performed is by understanding the interconnectedness of situation stimulus response organism and the consequence of the response (Gredler, 1996: 116) in Supardan (2015: 251).

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