



## Meta-Analysis: Science Learning Based on Local Wisdom Against Preserving School Environments During the Covid-19 Pandemic

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### Article Info

Article History:

Received: July 2021

Accepted: August 2021

Published: August 2021

Keywords:

Covid-19, Environmental Preservation, Local Wisdom, Science Learning

### Abstract

*This study aims to find out science learning based on local wisdom in environmental conservation during the Covid-19 pandemic. This research is a type of meta-analysis research. The sample of this research comes from 30 articles of reputable national and international journals. The data sources were obtained from the google scholar database, ScienceDirect, Wiley of Taylor, IEEE, and Eric. The sampling technique used was purposive sampling technique. The selection of this sample is related to learning science based on local wisdom in environmental conservation efforts. The data analysis technique is the Milles & Huberman model analysis technique which consists of 3 stages, namely reducing data, presenting data, and drawing conclusions. The results showed that science learning based on local wisdom was very good for environmental preservation in Covid-19, the effect size value was 0.923 in the high category.*

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p-ISSN 2252-6579  
e-ISSN 2540-833X

## INTRODUCTION

The pandemic *coronavirus disease-19* has had a huge impact on education in the world (Carrillo & Flores, 2020; Teräs, 2020). The Covid-19 virus outbreak has spread to more than 213 countries in the world (Kurniati *et al.*, 2021). Therefore, the education system that was originally face-to-face has turned into an online system. This makes education no longer run effectively (Wang *et al.*, 2020). All countries in the world carry out very strict supervision of the causes of this virus (Lo Moro *et al.*, 2020). The spread of the Covid-19 virus has interrupted the interaction between teachers and students in learning (Coman *et al.*, 2020). Teaching and learning activities during the Covid 19 period are carried out online (Onal, 2020). Online learning is one way to keep learning activities carried out.

Online learning is a solution to keep learning activities during the Covid-19 pandemic. Online learning is learning that is carried out via laptops or mobile phones with the help of an internet network (Wuladari *et al.*, 2020; Nurgiansah, 2021). Learning the online system as a student has the breadth of time in learning (Fitriyani *et al.*, 2020). Not only that, students and learning teachers are able to interact and carry out learning activities without face to face (Dhawan, 2020). Learning activities with online systems are carried out through applications learning. Learning applications that are widely used are *Zoom Meeting*, *Google Meet*, *Edmodo*, *Zenius*, *WhatsApp*, and so on. The advantage of doing an online learning system is that it opens up opportunities for a student in a creative, innovative, and collaborative learning environment, and is directly involved emotionally in learning (Widyanti & Park, 2020; Nuaim, 2012). Learning that really needs students to be creative, innovative and collaborative is science learning (Santosa *et al.*, 2021).

Science learning is an important learning mastered by students. In addition, science learning develops cognitive, character, attitudes and skills in an integrated manner (Puspitorini *et al.*, 2011). A teacher must have critical and innovative knowledge in science learning (Rahayu *et al.*, 2012). Teachers must provide science learning to students so that students can receive knowledge effectively (Listyawati, 2012). The nature of learning given to students can foster a scientific attitude in students (Pamungkas *et al.*, 2017). Science learning really needs to be taught by students to grow the character and attitude of caring for the environment ((Khusniati, 2012; Taufiq *et al.*, 2014). Environmental conservation is closely related to local wisdom that must be preserved.

Local wisdom is a product that comes from the cultural values of the community (Uge *et al.*, 2019; Anggraini & Kusniarti, 2015; Ufie *et al.*, 2020). Learning based on local wisdom is able to grow social values and character in (Fadli & Mangesa & Andayani, 2015; Irwanto, 2020). Character values in local wisdom are weapons to respond to the current flow of globalization (Marhayani, 2016). In addition, the values of local wisdom are also a means to advance Indonesian culture (Mislikhah, 2020). Local wisdom-based learning is very good to be taught to students (Ramdiah *et al.*, 2020; Wahab *et al.*, 2020). Students who are taught local wisdom can actively solve environmental problems (Masub *et al.*, 2016). Environmental problems are an issue that really needs to be considered. Therefore, it is necessary to instill the values of environmental preservation from an early age in students (Setiyadi, 2013).

Previous research by Bakhtiar & Nugroho (2016) showed that science learning based on local wisdom can be used to preserve the environment. Research by Kurnia (2018) shows that religious-based local wisdom can be a solution in preserving the environment and culture in Kediri (Kurnia, 2018). Research by Noor & Sugito (2019) shows that multicultural-based learning can foster local wisdom (Noor & Sugito, 2019). Research by (2018) that science learning is very necessary for implementation for elementary school students (Hidayati *et al.*, 2020). Research by Rosala & Budiman (2020) shows that science learning really needs to be applied in various aspects of learning in schools (Rosala & Budiman, 2020). Based on this, this study aims to find out science learning based on local wisdom in environmental conservation during the Covid-19 pandemic.

**RESEARCH METHOD**

This study is a type of meta-analysis research. Meta-analytical research is research conducted by synthesizing evidence about statistically calculated effects or practices ( Cleophas & Zwinderman, 2010; Myers, 2005). The data source comes from the analysis of 30 reputable national and international journals. Data were obtained through Google Scholar, ScienceDirect, Wiley Taylor, Sage Journal, Springer Journal and Eric. The sampling technique used was *purposive sampling technique*. The data search process is related to learning science based on local wisdom for environmental conservation. The analysis technique is a descriptive quantitative analysis technique.

**Table 1** Criteria *Effect size*

<i>Effect size</i>	Category
0 ES 0.2	Low
0 ES 0.8	Medium
ES 0.8	High

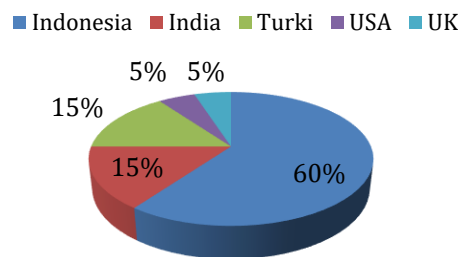
(Santosa, 2021)

**RESULTS AND DISCUSSION**

*Results*

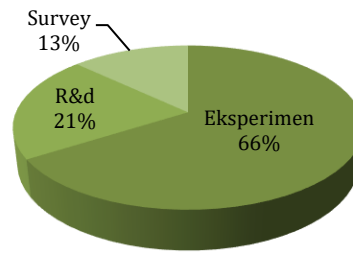
Based on the results of a meta-analysis of 23 reputable national and international journals, it can be seen in Diagram.1

**Figure 1** Meta-Analysis of Journals by Country



Based on Diagram 1 explains that there are 23 national and international journals conducted a meta-analysis. The journals taken are published in 2000-2021 related to science learning based on *local wisdom* in environmental conservation during the period Covid-19. The journal samples came from 5 countries, namely 5% United State America, 5% United Kingdom, 15% Turkey, 15 % India and 15 % Indonesia. In addition, this study also conducted a meta-analysis of the types of research, which can be seen in Diagram. 2

**Figure 2** Meta-analysis Based on Research



Based on Table 2 shows that there are 3 types of research used in research, namely experimental research, development (R&D), and survey. Experimental research consists of 15 samples or 66%, development of 5 samples or 21%, and surveys of 3 samples or 13%. Therefore, a meta-analysis needs to be carried out on the population correlations used. The correlation of the study population can be Table.3

**Table 3** Population Correlation

No	Author	N	$r_{x_1y_2}$	(N $r_{x_1y_2}$ )
1	Sapitri <i>et al</i> ,	56	0.12	6.72
2	Dukic & Volic	132	0.86	113.52
3	Salequzzaman & Stocker	23	0.52	11.96
4	Julaiha <i>et al</i> ,	67	0.31	20.77
5	Pramadi <i>et al al</i> ,	22	0.11	2.47
6	Dewi <i>et al</i> ,	123	0.70	125.46
7	Widyanigrum	47	0.23	10.81
8	Hidayati <i>et al</i> ,	78	0.45	35.1
9	Suhartini <i>et al</i> ,	145	0.01	146.45
10	Primayanti <i>et al</i> ,	112	0.97	108.64
11	Suparya	98	0.67	65.66
12	Nadlir	56	0.32	17.92
13	Mungmachon	61	0.45	27.45
14	Harun <i>et al</i> ,	144	0.35	194.4
15	Annisa & Mundilarto	74	0.56	41.44
16	Hadi <i>et al</i> ,	145	1.65	239.25
17	Ardan	34	0.20	6.8
18	Mulyadi	23	0.14	3.22
19	Kunsumawati	56	0.52	29.12
20	Sari <i>et al</i> ,	178	0.02	359.56
21	Aditya <i>et al</i> ,	156	0.32	205.92
22	Ufie <i>et al</i> ,	173	1.00	358.11
23	Ventegoth <i>et al</i> ,	134	1.00	136.68

Based on Table 3 that the total correlation value of the sample population is 2267.43 with the average correlation value of the research sample is 0.78. It can be concluded that there is a correlation between the population of science learning based on *local wisdom* and the preservation of the school

environment. The next step is to calculate the value of the variance of the sample used. The value of the sample variance can be seen in table 4.

**Table 4** Sample Variance

No	Author	N	$rx_1y_2$	$(r- rx_1y_2)$	$(r- rx_1y_2)^2$	$N (r- rx_1y_2)^2$
1	Sapitri <i>et al</i> ,	56	0.12	0.35	0.1225	6.86
2	Dukic & Volic	132	0.86	0.16	0.0256	3.37
3	Salequzzaman & Stocker	23	0.52	- 0.29	0.0841	1.93
4	Julaiha <i>et al</i> ,	67	0.31	- 0.19	0.0361	2.41
5	Pramadi <i>et al</i> ,	22	0.11	- 0.02	0.0004	0.0088
6	Dewi <i>et al</i> ,	123	1.00	-0.76	0.5776	71
7	Widyanigrum	47	0.23	- 0.38	0.1444	6.78
8	Hidayati <i>et al</i> ,	78	0.45	- 0.65	0.4225	32.95
9	Suhartini <i>et al</i> ,	145	1.00	- 0. 81	0.6561	95.13
10	Primayanti <i>et al</i> ,	112	0.97	- 0. 63	0.3969	44.45
11	Suparya	98	0.67	0.59	0.3481	34.11
12	Nadlir	56	0.32	- 0.62	0.3844	21.52
13	Mungmachon	61	0.45	- 0.78	0.6084	37.11
14	Harun <i>et al</i> ,	144	0.35	- 0.89	0.7921	113.76
15	Annisa & Mundilarto	74	0.56	- 0. 52	0.2704	20
16	Hadi <i>et al</i> ,	145	0.65	- 0. 43	0.1849	26.81
17	Ardan	34	0.20	- 0. 49	0.2401	8.16
18	Mulyadi	23	0.14	- 0. 27	0.0729	16.76
19	Kunsumawati	56	0.52	- 0.32	0.1024	5.73
20	Sari <i>et al</i> ,	178	1.00	- 0. 66	0.4356	77.53
21	Aditya <i>et al</i> ,	156	0.32	- 0. 92	0.8464	132.03
22	Ufie <i>et al</i> ,	173	0.87	0. 49	0.2401	41.53
23	Ventegoth <i>et al</i> ,	134	1.00	0.36	0.1296	17.36
	Total	<b>2137</b>	<b>12.62</b>			<b>722.1688</b>
	Average	<b>92.91</b>	<b>0.54</b>			<b>0.27</b>

Based on Table 4. that the total value of the sample variance is 722.1688 with the average (mean) sample variance of 0.27, it can be concluded that the population has the same variance. Therefore, to see the effect of local wisdom-based science learning on environmental conservation, it is necessary to calculate the effect size. The value of the effect size can be seen in. Effect Size Value of Wisdom-based Science Learning on Environmental Conservation in the Covid-19 Pandemic Effect size value is 0.923 with the "high" category " Thus, it can be concluded that science learning based on local wisdom has a great influence on the preservation of the school environment during the Covid-19 pandemic.

**Discussion**

Science learning during the Covid-19 pandemic is very necessary for students to learn. Science learning will be able to give an impression to students in learning the concept of a real environment (Wahjudi, 2015). Not only that, many science learnings study the real environment systematically (Wijanarko, 2017; Listyawati, 2012). At this time, teaching and learning activities about the environment can be easily learned based on *local wisdom*. Science learning which consists of the realm of biology, physics and chemistry will be able to foster a sense of environmental care among students and the community in the Covid-19 era. Science learning should be based on local wisdom, students are able to find out about the function of the environment directly (Andriani, 2016). Students to be able to establish harmonious relationships between God, Humans and the environment during this Covid-19 period (Suartika *et al.*, 2019).

This science learning based on local environmental wisdom has an influence on the preservation of the school environment during the Covid-19 period. This is in accordance with the results of the test *effect size* of 0.923. Therefore, science learning is based on wisdom Local or *local wisdom* is very well applied to this Covid-19 pandemic. The values of local wisdom instilled in students will be petrified from an early age which will help the community in dealing with Covid-19 (Widodo, 2012). The values of local wisdom can come from culture or customs. These cultural values combined with natural science learning will create a harmonious life between students, teachers, and the community in interacting with the environment during the Covid-19 period ( Dewí *et al.*, 2019). Not only that, learning that applies the value of local wisdom will help maintain ecological continuity and foster student identity and character(Xiang, 2016; Sumardjoko & Musyiam, 2018). Ecological problems during the Covid 19 pandemic can be resolved by strengthening the value of local wisdom in students and the community.

Local wisdom aims to create a healthy and harmonious living environment. If the implementation of science learning is said to be successful if the values of local wisdom are already owned by students (Ramirez *et al.*, 2019). In addition to the values of local wisdom, socio-ecological values must also be instilled (Avriel-Avni *et al.*, 2019). This is the solution to create quality preservation of the school environment in the era of the Covid 19 pandemic. Schools are places where the teaching and learning process takes place which must have a conducive environment. This conducive environment is improved by increasing the values of local wisdom (Akgün, 2020; Young, 2016).

## CONCLUSION

Based on this research, it can be concluded that science learning based on local wisdom has an effect on the preservation of the school environment during the Covid-19 period with an effect size value of 0.923 in the high category.

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