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Pre-Service Elementary Teacher in Global Warming and Environmental Health Issue: Attitude in Natural Science Learning

Ilmi Zajuli Ichsan[1*], Rika Sa'diyah[2], Nur Fadli Hazhar Fachrial[3], Ainur Rosyid[4], Rosa Susanti[5]

[1] Faculty of Teacher and Educational Science, Universitas Mohammad Husni Thamrin, Indonesia
[2] Islamic Educational Management, Universitas Muhammadiyah Jakarta, Indonesia
[3] Elementary Teacher Education, STKIP Arrahmaniyah, Indonesia
[4] Elementary Teacher Education, Universitas Esa Unggul, Indonesia
[5] Faculty of Health Science, Universitas Mohammad Husni Thamrin, Indonesia

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Abstract: Pre-service elementary teachers' attitude in supporting the achievement of the ecosystem and environmental balance is necessary to implement. Most global warming topic taught in natural science learning has yet to be based on environmental orientation. This research purpose was to analyze pre-service elementary teachers' attitudes in preventing global warming and environmental health issue. The research uses a descriptive method with the data collection technique of the survey. The research samples include 239 students of the Department of Elementary Teacher Education in Jakarta, Bogor, Depok, Tangerang, Bekasi (*Jabodetabek*) area. These students are pre-service elementary teachers. Data analysis used is by comparing the average score of each item and indicator. The research result indicates that the average score for attitudes is 87.33 suggesting that the attitude score is relatively high. The attitudes, however, have not been fully implemented in the form of attitudes to prevent global warming and environmental health issue. Natural science learning plays a prominent role in providing understanding related to global warming. The research results also recommend the application of more applicable lecture activities to the pre-service elementary teachers to improve the pre-service teacher attitude in natural science learning. The research concludes that the score of the pre-service elementary teachers' attitudes is within a high category.

Keywords: Attitude; Pre-service elementary teacher; Natural science learning

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Introduction

Global warming is a relevant and suitable issue to the current development. Various global warming-related issues include the utilization of Chlorofluorocarbon (CFC), the increase of motor vehicle fumes, and waste management (Karpudewan et al., 2015; Silva et al., 2015). Global warming education needs to be developed for various parties in society. This is particularly to urban society. Global warming brings numerous impacts on community sustainability and environmental health. The university student component is a subject that can participate in preventing global warming.

Students of the Department of elementary school education are one of the community components that can contribute to preventing global warming and environmental impact for human health. They will be an educator group in elementary schools in various cities and villages. Global warming education is imperative to be taught to elementary school students since environmental values must be instilled from an early age (Braun et al., 2018; Timur et al., 2013). This requisite demands a pre-service elementary school to have attitudes that support global warming prevention efforts. The attitudes are vital components before its implementation in the form of environmental behaviors. Environmental awareness attitudes will illustrate someone's impact on his/her environment (Razzaq et

* Corresponding Author: ilmizajuliichsan@thamrin.ac.id

al., 2018; Schimek, 2016; Zerinou et al., 2020). If the environmental attitudes are within a low category, it will be difficult to enhance skills in maintaining the environment, especially those related to global warming issues.

The environmental attitudes of pre-service elementary teachers are formed through various learning in the natural science course. The course facilitates the pre-service elementary teachers to understand a variety of natural science-related concepts that include a discussion about global warming. Previous studies discuss student understanding of climate change impacts (Ashraf et al., 2012; Stevenson et al., 2017). Additionally, a study about the development of various environmental literacy-based learning media had been conducted that aimed at environmental health issue improvement efforts (Abiolu, 2019; Chen & Wang, 2018; Dani, 2011; Goldman et al., 2014). These previous studies, however, have yet discussed pre-service elementary teachers' attitudes in global warming topics in natural science learning.

Natural science learning at the university level becomes a vital aspect in the formation of student understanding to implement their studied science. The implementation in this context is in the form of environmental awareness attitudes and behaviors to support university students' health. The utilization of learning media, instructional strategies, and learning models plays an important role in developing global warming-related education. University students, who are pre-service elementary teachers, become important subjects in a lecture that discusses global warming. They can participate in fostering environmental awareness attitudes for other campus residents. Lecturers, as a facilitator, must create interesting innovation so that natural science learning at the university level can include concrete implementation and does not merely a discussion about concepts (Haglund, 2013; Suwono et al., 2017; Yang, 2018).

Based on the aforementioned, there is an urgency for the pre-service elementary teachers to have a lecture innovation in natural science learning, especially those that relate to global warming. The pre-service teachers' attitudes to efforts in preventing global warming and environmental health problem must be measured first. They will be an elementary teacher and teach students. Therefore, their attitudes in preventing global warming need to be put forward so they can be a role model for elementary students in maintaining the environment. Teachers who cannot provide an example for their students related to the issues will face challenges in teaching natural science education, especially on the global warming topic. Therefore, the current research aims at analyzing pre-service elementary teachers' attitudes in preventing global warming and environmental health issue.

Method

The research employed a descriptive method with a survey as the data collection technique. Data were collected using a simple random sampling from samples of students at the Department of Elementary Teacher Education in Jakarta and Depok areas. The total samples used in the research was 239 bachelor Program students of Elementary Teacher Education who are becoming pre-service elementary teachers. Samples divided into 34 male students and 205 female students. The research was started with instrument development. The research instrument was a questionnaire to measure environmental awareness attitudes that consisted of 10 items with four indicators. These indicators were developed by referring to Kaiser & Wilson (2004). The research began with performing the research stages as illustrated in Figure 1.

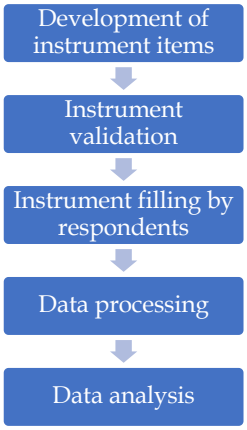

Figure 1. Research step

The next step of the research was validation and distributing the validated instruments to the respondents and analysis. The data analysis technique used was by comparing the average score of each item and indicator. The analysis results would indicate differences between the score for each item. Score categories are presented in Table 1.

Table 1. Categories of attitude score and interval score

Category	Interval Score
Very high	X> 81.28
High	70.64 <X ≤ 81.28
Moderate	49.36 <X ≤ 70.64
Low	38.72 <X ≤ 49.36
Very Low	X ≤ 38.72

Adaptation from Sigit et al. (2020)

Result and Discussion

The results of the instrument validation indicate that all items were valid with a reliability of 0.72, which means that the instruments could be used in the research. The validity results can be seen in Table 2.

Table 2. Results of instrument validation test of the pre-service elementary teachers' attitudes to global warming

Item	Pearson (r-value)	Category
Item1	0.636	Valid
Item 2	0.601	Valid
Item 3	0.596	Valid
Item 4	0.698	Valid
Item 5	0.696	Valid
Item 6	0.437	Valid
Item 7	0.660	Valid
Item 8	0.624	Valid
Item 9	0.738	Valid
Item 10	0.782	Valid

The research results indicate that the lowest score of all the categories of all sample pre service elementary teacher (A), male (M), and female (F) was in the 3rd item related to waste recycling. The pre-service teachers' attitude in recycling waste was the lowest among other items since the activity has not become a habit. Nevertheless, the research results, in general, suggest that the pre-service elementary teachers' attitudes were within a high category. Detailed scores of the measurement results are presented in Table 3.

Table 3. Measurement results of pre-service elementary teachers' environmental awareness attitudes

Item	A	M	F
Efforts in reducing carbon gas emission with electric vehicles	4.11	4.32	4.07
Limit oil-fueled vehicles	4.15	4.29	4.12
Recycle used papers at home	3.96	3.88	3.97
Cloth shopping bags to reduce plastic waste	4.69	4.50	4.73
Communities require education about the impacts of global warming	4.53	4.41	4.55
Lack of global warming education in natural science learning in elementary school students	4.10	4.15	4.09
Natural science learning media for elementary school needs development in global warming topic and environmental health issue	4.43	4.41	4.43
Elementary schools must provide suitable garbage bins in each classroom	4.71	4.59	4.73
Independent waste management facilities need to be constructed in elementary schools.	4.48	4.53	4.47
Extension is required to elementary school students related to waste recycling	4.51	4.47	4.52
Average	43.67	43.56	43.68
Average (scale score 100)	87.33	87.12	87.37
Category	Very high	Very high	Very high

Note: All (A), Male (M), Female (F); score interval 1-5 for each item

The measurement results of the pre-service elementary teachers' attitudes regarding global warming prevention imply that the lowest score was found in the first indicator, which is energy saving attitudes. The research also found that learning content related to energy saving needs to be emphasized on the pre-service elementary teachers. The results of the pre-service elementary teachers' attitudes can be seen in Table 4.

Table 4. Measurement results of the pre-service elementary teachers' attitudes based on each indicator

Indicators	Item number	A	M	F
Energy saving in preventing global warming	1 and 2	4.13	4.31	4.10
Waste recycling	3 and 4	4.33	4.19	4.35
Environmental education related to global warming	5, 6, and 7	4.35	4.32	4.36
Facilities of environmental education at elementary schools	8, 9, and 10	4.57	4.53	4.57

Note: All (A), Male (M), Female (F); score interval 1-5 for each indicator

All in all, the research results illustrate the condition of the pre-service elementary teachers' attitudes related to natural science learning in lectures. The discussion content related to global warming, as a whole, has been well understood; thus, the pre-service elementary teachers have a caring attitude towards global warming and environmental health problem prevention. Yet, several points related to the research results are still being evaluated to enhance natural science learning for the pre-service elementary teachers. Items related to recycling were still relatively low. This can be solved by performing various programs developed to familiarize the pre-service elementary teachers to care about the environment.

Programs to overcome the low attitude to recycle are by providing projects to the pre-service elementary teachers in the natural science learning lecture. The projects include a project of making handicrafts from used food containers. This project will train the pre-service elementary teachers to recycle daily used goods. Another program is related to awarding the pre-service elementary teachers who are able to perform community

service with orientation to waste management to prevent health problem. This movement will make them get used to implementing their knowledge in society. This program is also important to equip them before they go into society and become part of them (Hus, 2010; Liefländer & Bogner, 2018; Niankara & Zoungrana, 2018).

Moreover, the research results also indicate that the lowest indicator was related to energy saving. The low score in this indicator was due to the pre-service elementary teachers who are not used to having energy-saving attitudes in their daily life. Energy saving-related issues are suitable to the current development, namely efforts to prevent global warming, the developed environmentally-friendly technology such as free-emission vehicles and fuel-efficient vehicles, and the utilization of solar energy as a power source (Sipahutar et al., 2019; Song et al., 2017; Yedla & Park, 2017). Efforts from the technology development towards the development of green technology will be continuously applied at schools in the form of green schools.

The green school concept is actually easy to understand. It is a school condition that puts forwards environmentally friendly facilities to support students health condition and aspects at school areas (Buzov, 2014; Suleri & Cavagnaro, 2016). In a school with a green school concept, it will be easy to find bio pores holes to absorb water and green open space as a component to liven up the cool atmosphere and enhance air quality to support health of students. This will affect teachers' and students' convenience in learning. The green school concept should be instilled in the pre-service elementary teachers during the natural science learning lecture at the Department of Elementary Teacher Education.

In addition to environmentally friendly programs, efforts that can be made are to develop learning media for pre-service teachers according to global warming and environmental health issue. Learning media will help in understanding the process of various environmental phenomena that occur around us. The development of this media can be developed in science learning at the undergraduate level.

Conclusion

The research concludes that the pre-service elementary teachers' attitudes in preventing global warming were generally within a very high category. Nevertheless, certain aspects such as indicators of recycling and energy saving need improvement. The research suggests a learning media development for students of the Department of Elementary Teacher Education who will be a teacher. The development can be conducted by the lecturer of natural science learning for an elementary school course. The research bears some limitations that include the missing of treatments to the respondents that inhibit the comparison between two groups or more. The research was limited to analyzing the pre-service teachers' attitudes in preventing global warming and environmental health issue.

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