Analysis of high school students’ environmental attitude

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Abstract. This article reports the preliminary study on developments of physics teaching material that is integrated to climate change. The purpose of the research is to analyze survey’s result which will be used to find students’ environmental attitude. This research has used the descriptive statistic method. The results of this study indicate the environmental attitudes of students are low so it is necessary to develop teaching materials to improve it.

1. Introduction

The effects of climate change globally have become a world society attention, including Indonesian. Adaptation and mitigation responses to climate change are strongly influenced by behavioral and lifestyle choices [1]. Survey result of Sub Directorate of Indonesian Environmental Statistics beside the process of construction the environmental degradation, consumptive behavior and lifestyle also cause the environmental problem [2].

One of behavior that should be improved by the early generation is the environmental attitude. It has been reported that secondary school students consider that individuals, national governments and environmental and international organizations should joint responsibility for climate change mitigation [3].

For that reason, the early education about climate change is really required to decrease the bad effect of climate change by improving students’ attitude which is become a government’s attention. Improving students’ attitude should become the unit of studying process base on Law No. 20 of 2003 concerning Article 3 of the National Education System in Indonesia which asserts that the function of national education is to improve the potency and to establish the character even the dignified nation to create an educated civilization.

The character education should improve fully in the national education system to achieve the aim of national education. One of the things that causes environmental damage is not embedded in the character of the environmental attitude and there is not responsibility on it [4]. The environmental attitude describes as attitude and action which always make an effort to avoid environmental damage and develop the efforts to fix environmental damage that has occurred.

The environmental attitude should become a behavior in studying process which is needed an integration teaching material about climate change to improve environmental attitude. Therefore, this research is as initial research in the development of that teaching material.
2. Research Method

The research has held on July 2018 in SMAN 2 Sungai Penuh. The population of this research is all of the students in the 11th grade that is 9 classes and the sampling method is purposive random sampling. From this research, it got a science class which 29 people as research sample, where 22 students are female (76%) and 7 students are male (24%).

The technique is descriptive research. Descriptive research is a research that use to find out the independent variable value, which one or more independent value) without using a ratio or connecting with other variables [5]. Subsequently processed by the statistical approach.

The collection method in this research is questionnaire method. The questionnaire that using in the research is a closed questionnaire (structural questionnaire), where the answer to the question is provided in the questionnaire. Therefore, the answers depend on the questionnaire and the respondent can not give a random answer. The questionnaire is arranged based on five dimensions of student's environmental attitude: (1) Fragility of nature's (2) The possibility of eco-crisis. (3) The reality of limits to growth. (4) Antianthropocentrism. (5) Rejection of exemptionalism. [6]

The draft items were sent to three specialists for formal review. Each item was placed into a matrix and then asked to be evaluated in terms of four areas: content validity, clarity, and understandability, accuracy and distracters. There were 39 items that spread in five dimensions as shown in table 1.

### Table 1. Distribute item

| Dimension                     | N item |
|-------------------------------|--------|
| The Fragility of nature's balance | 10     |
| The possibility of eco-crisis  | 10     |
| The reality of limits to growth | 6      |
| Antianthropocentrism          | 3      |
| Rejection of exemptionalism   | 10     |

The processed of the data is using a measurement scale, that is interval scale change to an ordinal scale with three categories (high, medium, and low). The interval scale that changed to an ordinal scale consists of three categories, those are high categories have scored more than \( \bar{x} + 0.5 \text{ SD} \), medium categories have score \( \bar{x} - 0.5 \text{ SD} < x < \bar{x} + 0.5 \text{ SD} \) and low categories have score small than \( \bar{x} - 0.5 \text{ SD} \) (\( \bar{x} \) is average initial ability score and SD is standard deviation) [7].

3. Results and Discussion

The analysis result of the environmental attitude parameter of 29 respondents divided into five dimensions, those are: (1) Fragility of nature's balance, (2) The possibility of eco-crisis, (3) The reality of limits to growth, (4) Antianthropocentrism, (5) Rejection of exemptionalism that show in table 2.

### Table 2. The analysis result of students' environmental attitude (N=29)

| Dimension                     | Mean (\( \bar{x} \)) | Std. Deviation (SD) | Low (\( \bar{x} - 0.5 \text{ SD} \)) | Medium (\( \bar{x} - 0.5 \text{ SD} < x < \bar{x} + 0.5 \text{ SD} \)) | High (\( \bar{x} - 0.5 \text{ SD} \)) |
|-------------------------------|----------------------|---------------------|-------------------------------------|-----------------------------------------------------------------------------|--------------------------------------|
| the Fragility of nature's balance | 30.76                | 3.94                | 41.38                               | 20.69                                                                       | 37.93                                |
| The possibility of eco-crisis  | 26.62                | 4.17                | 44.83                               | 55.17                                                                       | 0.00                                 |
| The reality of limits to growth | 19.45                | 2.95                | 41.38                               | 13.79                                                                       | 44.83                                |
| Antianthropocentrism          | 9.14                 | 1.78                | 41.38                               | 17.24                                                                       | 41.38                                |
| Rejection of exemptionalism   | 33.24                | 5.46                | 34.48                               | 20.69                                                                       | 44.83                                |
Base on table 2, the result of this research for the fragility of nature’s balance indicate 37.93% respondents in low categories, 20.69 % respondents in medium categories, and 37.93% respondents in high categories. For the possibility of eco-crisis shows that 44.83% respondents in low categories, 55.17% respondents in medium categories and 0% respondent in high categories. For the reality of limits' dimension show that 44.83% respondents in low categories. And 13.79% respondent in medium categories and 44.83% respondents in high categories. The anti-anthropocentrism shown that 41.83% respondents in low categories, 17.24% respondents in medium categories and 41.38% respondents in high categories. And for rejection of exceptionalisms show that 34.38% respondents in low categories, 20.69% respondents in medium categories and 44.83% respondents in high categories. For the analysis students’ environmental attitude generally describes in figure 1.

Figure 1. Student’s environmental attitude

Figure 1 shows that 48.28% respondents in low categories, 17.24% respondents in medium categories, and 34.48% in high categories. In average, the students' environmental attitude is in low categories and it also showed in a previous research "that environmental attitude of high school students is at low level" [8].

There are many factors that cause the low students' environmental attitude, those are daily behavior, lack of students’ knowledge of about the environment, family background, social physiology, gender, age, social economy, and the others. To have a positive attitude toward the environment, it is necessary to be first aware and then knowledgeable about it [9]. Demography and social psychology factors also affect the low level of caring for children towards the environment [10]. Sex, age and socioeconomic status function as sources of variation for environmental attitudes [11,12,13]

Furthermore, if it is revied from the gender that is 22 female students and 7 male students, the analysis result of students' environmental attitude of female students show in figure 2 and male students show in figure 3.
Figure 2. Environmental attitude of female students

Figure 2 showing the respond of female students' environmental attitude, which is 45.45% respondent in low categories, 13.64% respondent in medium categories, and 40.91 respondents in high categories. On average, the students' environmental attitude in low categories.

Figure 3. Environmental attitude of male students

Figure 3 showing the respond of male students' environmental attitude, which is 57.14% respondent in low categories, 28.57% respondent in medium categories, and 14.29% respondent in high categories. On average, the students' environmental attitude in low categories.

Based on figure 2 and figure 3 which obtained that male students have lower students' environmental attitude than female students, and it same with the previous research found that females were more likely “to be more concerned about the environment yet know less about the causes and solutions to environmental issues than males” [10]. Then other research females have better environmental care attitudes than males [13].
4. Conclusion
Generally, the students' environmental attitude is in low categories. The mitigation of the extreme climate change is improving the students' environmental attitude. One of medium to improve is school because it can easily be entered school curriculum. Pearson et al. 2005; Arslan 2012; Ogunbode and Arnold 2012). For the next research, the teacher is expected to improve teaching material to increase the students' environmental attitude.

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