Level of sustainability awareness: where are the students’ positions?

I M Ridwan1,2*, I Kaniawati2*, A Suhandiri, A Samsudin2, and R Rizal3

1Program Studi Pendidikan Ilmu Pengetahuan Alam, Sekolah Pascasarjana, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi No. 229, Bandung 40154, Indonesia
2Departemen Pendidikan Fisika, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi No. 229 Bandung 40154, Indonesia
3Program Studi Pendidikan Fisika, Universitas Siliwangi, Jl. Siliwangi No.24, Indonesia
*irwanmr@upi.edu, idakaniawati@yahoo.com

Abstract: Education for sustainable development (ESD) is a concern for not only Indonesian government but also worldwide. To create sustainable education, every individual has the responsibility to keep ESD as valuable capital for today's and future generations. The aim of this study to get information on the level of awareness about sustainability in protecting planet Earth. In addition, this study aims to work out the extent of sustainable awareness within the concept of sustainable development education among pre-service physics teacher based on gender at one of the universities in Tasikmalaya. Data collection was administered employing a closed questionnaire. The results showed that the sustainability awareness of students with an average value of 0.77 was in the high criteria. However, the sustainability practice awareness category includes the standards of rarely done. In addition, the sustainability awareness of female students is relatively higher compared to male students with percentage ratio of 78.1% and 75.5%. In conclusion, although they have a high level of sustainability awareness, students are “still less effective” in the category of “sustainability practice awareness with performance” and “practice some attitudes in making practices that support sustainable development”.

1. Introduction

Education is considered as one of the most effective parts to provide understanding and to encourage people to gain knowledge, attitudes, and values needed for a sustainable to come. In realizing the awareness of sustainable development, the United Nations has declared the period of 2030 as a decade of education for sustainable development. This aims to shape the character that has awareness in a sustainable life.

This demand is in line with the education pillars developed by UNESCO, i.e. learning to know, learning to do, learning to be, and learning to live together. The United Nations through UNESCO declared 2030 as Sustainable Development which marks a paradigm shift in the global framework for development and presents opportunities and directs development with sustainability as its core. One of the goals of the agenda is to ensure quality, fair education, and promote life-long learning opportunities for everyone [1]. Besides, students’ experience in certain concepts can be used to make the learning process more meaningful [2].
Indonesian government has tried to implement a national education system, which enhances faith and piety and noble character in order to educate the nation's life, as well as education that supports sustainable development regulated by law. This mandate was then carried out not only by Law No. 20 Year 2003 about national education system [3], but also by Law No. 32 Year 2009 [4] concerning environmental protection and management as well as Law No. 17 Year 2007 regarding national development plan 2005-2025 [5].

In fact, one of the newest forms of Indonesia's commitment in effort to realize the Sustainable Development Goals is the enactment of President Decree No 59 year 2017 concerning the implementation of the Achievement of Sustainable Development Goals (SDG) which contains documents containing global goals and objectives for 2016 to 2030 [6]. Achieving development targets and goals both at global and national level has its own challenges with a variety of limited resources and funding. Therefore, collaborative efforts between stakeholders built on the foundation of "mutual trust" between the government, development partners, philanthropy, the business world, academics and the community must be increased.

The results showed that social and ecological behavior showed unsustainability. The development of the world since the industrial revolution in the 19th century has had a significant impact on changes in the global environment [7] today we are in an era where changes on Earth are largely caused by critical and extensive human behavior [8]–[12]. As a consequence of this kind of behavior, the planet we live in will lose its ability to make available the resources and conditions needed to meet human needs.

The results of other studies conducted by de Pauw indicate that ESD can have an impression on student outcomes in terms of their awareness of sustainability [13]. The results of this research reveal the key role of ESD in overcoming elementary school, paving the way for a more sustainable future.

Research in higher education is essential for sustainable development, but to succeed, new strategies of conducting research are needed. Research for sustainable development is comprehensive as all research which are carried out in the institutional situation of higher education contribute to sustainable development, and propose twenty-two initial appearances of this concept. Various stakeholders, and practitioners from universities in general, recall (re) the orientation of research towards sustainable development and offer the start of dialogue on the issue [14].

The purpose of this study is to describe and categorize the profile of sustainability awareness of physics education students who have attended IPBA lectures on atmospheric topics in the concept of sustainable development education. In addition, this study aims to describe gender differences in the sustainability awareness profile based on three categories, namely (1) sustainability emotional awareness, (2) behavioral sustainability and attitude awareness, and (3) sustainability practice awareness.

2. Methods
The research method is descriptive research through techniques of questionnaire with a likert scale adopted from Hassan's research [15]. This method is chosen to obtain information about the level of sustainability awareness in the state universities in Tasikmalaya. The samples were chosen by purposive sampling, consisting of 70 physics education students (26 male students and 44 female students). All statements are divided into these three categories. This can be seen in table 1 below.

| Sustainability awareness category            | Items       |
|--------------------------------------------|-------------|
| Sustainability emotional awareness         | 2, 4, 5, 15 |
| Sustainability behaviour and attitude      | 1, 6, 7, 8, 11, 12 |
| awareness                                  |             |
| Sustainability practice awareness          | 3, 9, 10, 13, 14 |

Table 1. Sustainability awareness statement items for each category.
The questionnaire used is a questionnaire with yes or no questions. The data are then analysed using mean and percentages by referring to the level of sustainability awareness which can be seen in Table 2.

| Table 2. Level of sustainability awareness [15] |
|-----------------------------------------------|
| **Mean** | **Category** |
| 1 – 2.33 | low |
| 2.34 – 3.66 | medium |
| 3.67 – 5.00 | high |

Then the statements of pre-service teacher are divided into three categories, i.e. sustainability emotional awareness, behavioural sustainability and attitude awareness, and sustainability practice awareness. The statements are then described with reference to Table 3.

| Table 3. Categories of sustainability awareness [15] |
|-----------------------------------------------|
| **Sustainability awareness (%)** | **Meaning** |
| 0.00 – 39.9 | Practices that seldom or dislike to be done |
| 40.0 – 69.9 | Practices that are done/happened moderate/medium |
| 70.0 – 100.0 | Practices feelings that are most likely done/happened |

3. Result and Discussion

Students’ sustainability awareness outline is measured by 15 items to describe their perceptions about sustainability emotional awareness, behavioural sustainability and attitude awareness, and sustainability practice awareness in their daily lives. Table 4 shows the mean score and the total percentage of pre-service teacher response statements for each item.

| Table 4: Mean score and total percentage “Agree (1)” |
|-----------------------------------------------|
| **Item** | **Statement** | **Mean** | **Agree (%)** |
| 1 | I examine environmental issues within the mass media | 1.00 | 100.0 |
| 2 | I really care about environmental issues in my place | 0.94 | 93.6 |
| 3 | I continuously discuss about environmental problems with my friends | 0.68 | 68.1 |
| 4 | I sense disappointed with air pollution | 0.98 | 97.9 |
| 5 | I sense disappointed with river pollution | 0.98 | 97.9 |
| 6 | I appreciate biodiversity | 1.00 | 100.0 |
| 7 | I concern about smoke that is omitted by vehicles | 1.00 | 100.0 |
| 8 | I try to decrease amount of waste at home by collecting things that can be recycled | 0.55 | 55.3 |
| 9 | I compost the food residue to useful items such as fertilizer | 0.30 | 29.8 |
| 10 | I don't use plastic bags to wrap things. | 0.36 | 36.2 |
| 11 | I save the use of electric energy at home. | 0.89 | 89.4 |
| 12 | I save the use of water supply | 0.89 | 89.4 |
| 13 | I convey the importance of protecting the environment to my family members. | 0.81 | 80.9 |
| 14 | I am involved in the various environmental awareness activities in campus. | 0.23 | 23.4 |
| 15 | I realize the importance of being responsible for the environment | 1.00 | 100.0 |

**Mean**

| **Level indicator: Mean:** 0.00 - 0.33 low; 0.34 - 0.67 middle; 0.68 - 1.00 high |
From table 4 above with an average value of 0.77, the level of sustainability awareness of students is included at the high level. The instruments and scoring have been modified and validated by experts.

This study shows that the level of awareness in the concept of sustainable development among students is high. Respondents believe and understand that there must be a balance between the environment and development within the area being developed. Even 100% of respondents said they were very conscious of their responsibility towards the environment. However, they cannot link several aspects, including social, economic and environmental aspects with environmental protection issues.

Analysis of this item based on the percentage of responses identifies three categories of sustainability awareness. Interpretations for each category can be seen in Table 3.

![Figure 1. Percentage of Sustainability Awareness by category](image)

From figure 1, it is known that the sustainability practice awareness category has the smallest percentage of agreement at 48% compared to the other categories. This means that students rarely practice sustainability such as discussing environmental issues with friends, making compost from leftover food waste, reducing the use of plastic bags, discussing environmental problems with families and also taking action to overcome these environmental problems and are categorized as moderate/medium. This is in line with previous research e.g. [15]–[17] which explain that sustainability practice awareness of pre-service teachers is the lowest category among other aspects.

Furthermore, the percentage of behavioural and attitude awareness categories is 89%. That means students in this category "practice feelings that are most likely done/happened". Although the statement "I compost the food residue to useful items such as fertilizer", "I don't use plastic bags to wrap things", "I am involved in the various environmental awareness activities in campus" were respectively 29.8%, 36.2%, and 23.4%, which mean students rarely do this but the average percentage as a whole shows that the category of attitudes towards the environment (behavioural and attitude awareness) of students are represented in practices that are done/happened at the level of moderate/medium.

The percentage of environmental awareness categories (emotional awareness) is 97%, which means that students have a high emotional concern for the environment. These concerns include feeling concerned with environmental issues, feeling disappointed with the pollution in the air and rivers and being aware of human responsibility towards the environment, mostly owned by students.

The next comparison group is sustainability awareness difference between male students and female students, as shown in the following diagram:
Based on the figure 2, female students have an awareness level of 78.1% and men with a percentage of 75.5%. This shows that female students have better attention and awareness compared to male students. This is in contour with research conducted by Barnas that female students are better in knowledge, attitudes and behaviours in preserving the environment e.g. [17]–[22].

Besides, the comparison of each sustainability awareness category between male and female students can be seen in the following diagram:

Women’s sustainability awareness is better than men in almost all categories. Although in the behavioural and attitude awareness category, male students are better than female students. As the end of the discussion, although students who have attended IPBA lectures by including aspects of ESD have a high level of continuous awareness, they find it problematic to act and practice some attitudes in making behaviours that support their sustainability for the better. Students at least practiced in “discussing and conveying information about the environment to their family members” (80.9%). Conversely, in item “I don’t use plastic bags to wrap things” (36.2%), “I compost the food residue to useful items such as fertilizer” (29.8%) and item “I am involved in the various environmental awareness activities in campus” show the smallest percentage (23.4%) and this practice is the most difficult to practice in their daily activities.
4. Conclusion
The awareness of pre-service teachers' environmental sustainability in the idea of sustainable development amongst students is "high". Among the three categories of student awareness, the sustainability practice awareness category has the smallest percentage of agreement at 48%. Besides, it turns out that the sustainability awareness of female students is better than with male students. In addition, female students have an awareness level of 78.1% and men with a percentage of 75.5%. This means that female students have better attention and awareness compared to male students.

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