College Students Practice on Sustainable Development Goals: A Study About Environmental Sustainability in Coastal Area

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Abstract. The Sustainable Development Goals (SDGs) agenda until 2030 is a shared concern and responsibility, including universities. The extent to which universities have made efforts to realize the SDGs can be seen from the level of student practice in realizing the SDGs, one of which is related to a sustainable environment. The purpose of this study was to measure the level of student practice related to environmental sustainability. The study was conducted in October 2024 at Universitas Maritim Raja Ali Haji, Indonesia, involving 223 Biology Education Students. This study is a descriptive study with a quantitative approach. The data collection techniques and instruments used were questionnaires. The data were analyzed using descriptive methods. Overall, the level of student practice related to environmental sustainability is in enough category. These results indicate the need for action from universities to increase the level of student practice in efforts to realize the SDGs, including those related to a sustainable environment. Efforts can be made in the form of integrating SDGs into the curriculum or in various programs and projects involving students.

1 Introduction

In order to achieve global welfare for the world's people, the United Nations has initiated a Sustainable Development Goal agenda until 2030. This agenda was initiated on September 15th, 2015 [1]. In its implementation, 17 goals will be achieved in order to realize a prosperous community life [2–4]. The 17 goals (G) are No Poverty (G-1), Zero hunger (G-2), Good health and well-being (G-3), Quality education (G-4), Gender equality (G -5), Clean water and sanitation (G-6), Affordable and clean energy (G-7), Decent work and economic growth (G-8), Industry, innovation and infrastructure (G-9), Reduced inequalities (G -10), Sustainable cities and communities (G-11), Responsible consumption and production (G-12), Climate action (G-13), Life below water (G-14), Life on land (G-15), Peace, justice and strong institutions (G-16), and Partnerships for the goals (G-17) [5–7].

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If analyzed further, the 17 goals in the SDGs are broadly related to the environment. In other words, in realizing the SDGs, environmental factors and impacts are things that are considered [8–11]. For example, in G-6: Clean water and sanitation, this aims to cultivate efficient behavior in using water and awareness to protect ecosystems related to water [12–15]. Another example is the G-7: Affordable and clean energy, which aims to increase the use of renewable energy that has minimal adverse impacts on the environment [16–19]. In other words, environmental aspects are a concern when implementing efforts to realize the SDGs [20–23].

Realizing the SDGs is not only the task of the UN and the government but also that of all people around the world. To realize this and increase public awareness of the importance of realizing the SDGs to achieve a prosperous community life, SDGs are also introduced through school or university environments [24–26]. Universities, in particular, have a very important role in implementing and achieving the SDGs because of the contributions they make, including in teaching and research [27]. In other words, universities have a significant role and impact in community development [28]. This makes the SDGs a major aspect that should be considered in programs initiated at universities [29]. As in Indonesia, in providing research grants and community service, the Directorate of Research, Technology, and Community Service, known as DRTPM, requires SDG elements to be integrated into research proposals and community service proposed by lecturers.

Many things can be done to evaluate the extent to which efforts to achieve SDGs have been carried out by a university, including looking at the extent to which practices or behaviors related to achieving SDGs have been implemented by students. To get used to practices in order to achieve SDGs, the implemented curriculum also plays a role in shaping the character or habits of students. [24,26,30]. The involvement of students in projects or programs related to SDGs also has an impact on the formation of habits practiced by students. [31–33]. This shows how important it is to provide an understanding of SDGs and to get students used to practicing to realize SDGs because students are agents of change in society. [34–36]. The habits or practices carried out by students will be carried by them into society so that they will be able to influence society to carry out similar practices.

Considering the various environmental problems that are occurring in the world, such as increasingly worsening climate change [37,38], the seas that cover 70% of the earth's surface are filled with various plastic waste that damages the ecosystem [39,40], and other environmental issues that affect the welfare of society, indicating the importance of achieving SDGs, one of which is forming good practice habits. Among the forms of habitual practices carried out by students as a manifestation of efforts to achieve SDGs are habitual practices related to the environment. As is the case with reducing the impact of climate change in accordance with G-13, students implementing the practice of reducing the use of motorized vehicles [41], the use of air conditioning [42], and some electronic or technological devices [42,43] which contributes to increased greenhouse gas emissions in the atmosphere [44]. In addition to the above practices, there are many other practices related to the environment that can be carried out by students in order to achieve the SDGs. The level of practice carried out by students related to environmental sustainability needs to be explored further as a picture of the extent to which universities shape behavior or accustom students to practices related to achieving SDGs. To answer this problem, a study was conducted to measure the level of student practices related to environmental sustainability.

2 Methods

This research is a descriptive study. The approach used in this study is a quantitative approach. This research was conducted in October 2024 at Universitas Maritim Raja Ali Haji, Tanjungpinang, Indonesia, involving 223 respondents from the Biology Education Study

Program. Respondents involved in this study came from different semesters, ranging from first-year students to fourth-year students.

Data collection was conducted using a questionnaire method. Data was collected through a closed questionnaire to obtain information about the level of student practice related to SDGs related to environmental sustainability. The instrument used was an instrument adapted from a research instrument conducted by [45,46]. The list of questions in this research instrument is as follows.

Table 1. List of question items in the research instrument

No	Item Codes	Items	SDGs
1	P-1	I avoid using plastic straws at restaurants/cafes.	G-14
2	P-2	I bring my own reusable shopping bag for my daily shopping needs.	G-12
3	P-3	I recycle materials made of plastic, paper, or glass.	G-12
4	P-4	I conserve the use of water supply.	G-6
5	P-5	I prefer public transport rather than private transport.	G-13
6	P-6	I switch off the electrical appliances of my home that I don't need.	G-13
7	P-7	I turn off the air-conditioner and lights in the classroom after class.	G-13
8	P-8	I use environmentally friendly renewable energy.	G-7
9	P-9	I avoid using animal-skinned products.	G-12; G-15
10	P-10	I am willing to pay more to buy environmentally friendly products.	G-12; G-13
11	P-11	I take additional courses or classes to increase my knowledge regarding environmental sustainability.	G-4; G-13
12	P-12	I participate in events (ex: seminars, talks, workshops) that relate to environmental sustainability.	G-4; G-13
13	P-13	I talk about environmental sustainability with my friends and family.	G-12; G-13
14	P-14	I think about how I might damage the natural environment.	G-12; G-15
15	P-15	I have changed my lifestyle by reducing waste.	G-12
16	P-16	I don't buy things from companies that have a poor track record when it comes to caring for the environment.	G-12; G-13
17	P-17	I pick up litter when I see it in a park or a natural area.	G-12; G-13
18	P-18	I am a volunteer working in an environmental care institution/group.	G-13; G-15; G-17
19	P-19	I prefer walking or cycling rather than using a motorized vehicle.	G-11; G-13

The answer for each question item is given as many as 5 choices using a Likert scale. The answer choices for each question are as follows.

Table 2. Answer choices for each question item

No.	frequency of practice	Score
1	Always	5
2	Often	4
3	Sometimes	3
4	Seldom	2
5	Never	1

The data is processed descriptively for each question item and for each student using the following equation.

$$P = \frac{f}{N} \times 100\%$$

With the formula P = percentage of the resulting score, f is the resulting score, and N is the maximum score.

The percentage of the resulting score will be interpreted as the level of student practice related to environmental sustainability. The categorization of the level of student practice related to environmental sustainability follows the guidelines presented in Table 3 below.

Table 3. Categories of Practice Levels related to environmental sustainability

No.	Category	Score Percentages Interval
1	Very Good (VG)	$84\% < P \leq 100\%$
2	Good (G)	$68\% < P \leq 84\%$
3	Enough (E)	$52\% < P \leq 68\%$
4	Poor (P)	$36\% < P \leq 52\%$
5	Very Poor (VP)	$20\% \leq P \leq 36\%$

3 Results and Discussions

The results of this study will be presented in two parts, namely the first part regarding the level of student practice related to environmental sustainability seen from each student and the second part regarding the level of student practice related to environmental sustainability seen from each question item given. The explanation of the two parts is as follows.

3.1 Part 1: Level of practice related to environmental sustainability reviewed by each student

Based on the research conducted, there is information regarding the parameters of the central tendency measure or the measure of data deviation from the research data analyzed. The information is as follows (Table 4).

Table 4. Each student reviewed the parameters of the measure of central tendency and the measure of the deviation of practice-level data related to environmental sustainability.

No	Parameters	Value
1	Number of respondents	223
	Male	21
	Female	102
2	Maximum Value (%)	95.79
3	Minimum Value (%)	34.74
4	Average (%)	60.03
5	Standard Deviation	0.10

In Table 4, it can be seen that there is a fairly large range between the maximum and minimum values (61.05%) of the percentage of students' practice levels related to environmental sustainability. In the table, it can also be seen that the average percentage of students' practice levels is 60.03%, and the standard deviation is quite small at 0.10. The standard deviation value shows that the spread of data from the average value is quite small.

Based on the data analysis conducted, the level of student practice related to environmental sustainability is at various levels ranging from very good, good, enough, poor, to the very poor category. The percentage of the number of students in each category of practice level is shown in Figure 1 below.

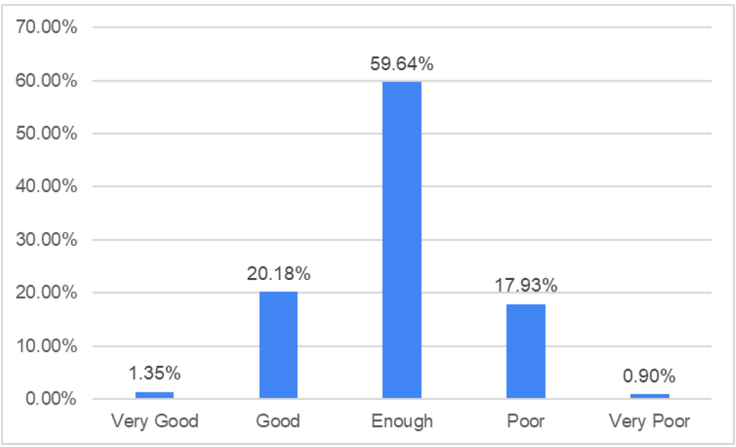

Fig. 1. Percentage of the number of students in each category of practice level related to environmental sustainability

In Figure 1 above, it can be seen that there are variations in the number of students in each category of practice level. The largest number of students is in the enough category, which is 133 students (59.64%). With a percentage that is quite far from the enough category, the number of students in the good and poor categories is almost the same, namely 45 students (20.18%) in the good category and 40 students (17.93%) in the poor category. In contrast to the other 3 categories, the number of students with practice levels in the very good and very poor categories is very small, namely 3 students (1.35%) for the very good category and 2 students (0.90%) for the very poor category.

Considering that there are only a few years left until the SDGs are achieved in 2030, the level of student practice related to environmental sustainability, which is on average in enough category, must certainly be a shared concern [47,48]. This shows that students have not fully implemented sustainable environmental practices in various aspects related to SDGs. This result can be caused by various things, including a lack of knowledge about SDGs [49,50] and a lack of awareness of the importance of SDGs [50–52].

3.2 Part 2: level of practice related to environmental sustainability as reviewed from the question items

Similar to the presentation of the results in part 1, in the presentation of the results in part 2, there is also information regarding the parameters of the central tendency measure or the size of the data deviation from the research data analyzed. The data analyzed in part 2 is the level of student practice related to environmental sustainability reviewed from each question item. The size of the central tendency and the size of the data deviation from the analysis of the results in part 2 can be seen in Table 5.

Table 5. Parameters of the measure of central tendency and the measure of the deviation of practice-level data related to environmental sustainability were reviewed from each question item.

No	Paramaters	Value
1	Maximum Value (%)	92.11
2	Minimum Value (%)	38.48
3	Average (%)	60.03
4	Standard Deviation	0.15

In Table 5, it can be seen that if the data analysis is carried out for each question item, then the size of the central tendency and the size of the deviation of the data produced are not much different from the results shown in the data analysis carried out for each student. In Table 5, it can be seen that the data range between the maximum and minimum values is 56.63%. The standard deviation shown in Table 5 also shows that there is a small deviation of the data from the average value.

Similar to the percentage of students in each category of practice level, the category of student practice level reviewed from each question item also shows varying results. Viewed as a whole, the average shows that the level of student practice related to environmental sustainability is in enough category. If traced for each item, the category of practice level indicated by the results of the research data analysis only has 4 categories, namely very good, good, enough, and poor. The results of the data analysis do not show any level of student practice related to environmental sustainability for the very poor category. For more details, the category of student practice level related to environmental sustainability for each question item can be seen in Table 6 below.

Table 6. Category of student practice level for each question item.

Item Codes	**Score (%)**	**Category**
P-1	54.71	E
P-2	50.49	P
P-3	47.35	P
P-4	84.30	VG
P-5	47.80	P
P-6	92.11	VG
P-7	55.25	E
P-8	53.99	E
P-9	70.40	G
P-10	56.32	E
P-11	38.48	P
P-12	52.56	E
P-13	60.54	E
P-14	81.61	G
P-15	75.43	G
P-16	62.06	E
P-17	68.34	G
P-18	38.65	P
P-19	50.22	P
Rata-Rata	60.03	E

When viewed from the suitability of the practices carried out with the SDGs, the results shown in Table 6 can also be grouped into several parts based on the corresponding SDGs as in Table 1. The results of the percentage of practice levels based on this grouping are presented in Table 7 below.

Table 7. Level of student practice based on SDGs grouping of question items

SDGs	Score (%)	Category
G-4	45.52	P
G-6	84.30	VG
G-7	53.99	E
G-11	50.22	P
G-12	63.62	E
G-13	58.37	E
G-14	54.71	E
G-15	63.55	E
G-17	38.65	P

In Table 7, it can be seen that for the question items corresponding to G-4, G-11, and G-17, the level of student practice shows results in the poor category. For G-4, the results show that the level of student participation and interest in taking additional classes to improve their understanding of sustainability is still minimal. Although only in small numbers, there are still students who have a bad perception of classes or courses related to the environment. [53], This could be the cause of low student participation in additional classes related to the environment. The results shown by G-11, where the low level of student practice in walking or using bicycles compared to using motorized vehicles, is actually not surprising because the results of the study also show that Indonesia is the country with the laziest people in the world for walking [54,55]. Many factors cause low walking activity among Indonesian people, including issues of safety, comfort, and security [56]. Regarding the level of student participation as volunteers in environmental actions that are in the bad category, it is also very unfortunate. This is certainly a challenge for universities in creating environmental programs that can involve students. This provides many benefits, including the creation of connections with various environmental organizations [57], forming a character of environmental love [58,59].

Several results show that the level of student practice related to environmental sustainability is in the enough category. Judging from the grouping of SDGS objectives, some of the levels of practice in enough categories include SDGs in G-7, G-12, G-13, G-14, and G-15. The results related to the use of environmentally friendly energy show that the level of practice in enough category is certainly caused by several factors. In the study [60], some of the reasons for the low use of renewable energy include economic factors such as the high cost of renewable energy, the difficulty of accessing renewable energy products, and dependence on products that contribute to environmental pollution. These results are, of course, also related to the level of student practice related to Climate Action, where the use of renewable energy aims to reduce the impact of environmental change. The level of student practice in enough category for climate action is also reinforced by the results of the study [31,61], which shows that the lack of a sense of responsibility to address climate change and the motivation to take action to reduce the impact of climate change is the reason why the level of student practice related to this is only in enough category.

The results shown in G-12, G-14, and G-15, of course, can also be explained in a related way, considering that what is consumed and produced will affect life on land and in water. For example, the use of plastic, which, if this habit is not addressed, will have an impact on the pollution of land and oceans [62]. For the purposes of these SDGs, the level of practice in enough categories is not enough. This practice must continue to be improved, considering the spread of pollution on land and at sea due to the lack of human wisdom in consuming

products [63–66] which is dominated by plastic and contains substances that are harmful to the environment [67–69].

Unlike other SDGs, the results of G-6 show the level of student practice in the very good category. These results show that students are already able to use water wisely. This SDG is to increase the efficiency of water use and protect ecosystems related to water [5]. This level of practice is certainly important for students to maintain and improve, especially in the Riau Islands region. With a region dominated by the ocean [70], a marine environmental care attitude and a sense of responsibility to protect the marine environment is an important thing to have [71,72].

4 Conclusion

Measurement of the level of student practice related to sustainable environment shows that the average level of student practice is enough category. This result indicates that universities must increase efforts to instill habits that can be practiced by students in their daily lives related to a sustainable environment. Among the efforts that can be made are to include aspects of SDGS in the curriculum, create various projects and activities related to SDGs, and involve students in them. Considering that 2030 is only a few years away, achieving SDGs is our shared responsibility. One indication of the extent to which universities have contributed to the development of human resources who are aware of the importance of SDGs can be seen from the level of practice carried out by their students.

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