How Indonesian students think about environment: Case study at North Coastal Central Java, Indonesia

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Abstract. Aberration in the northern coastal area of Central Java province of Indonesia is at an alarming level. What are the students think about the surrounding environment becomes very important information in increasing the environmental literacy in the region. 329 of students were given a questionnaire and some were interviewed to explore their opinions and verbal commitment to the various environmental issues and actions they could take. There is a variation in the verbal commitment of students who are dominated by willingness to invite others in pollution prevention efforts. Other results indicate that students have low scores on energy saving aspects. So it is necessary to update learning especially those related to environmental literacy.

1. Introduction

Today, many Indonesian beaches are already got aberration, especially the north coastal of Central Java. Based on information cited from Tempo daily (March 19, 2010) damage of the northern coastal ecosystem of Central Java is considered the most severe compared to other coastal areas in Indonesia. This condition is caused by the destruction of some mangrove forests that should be able to protect the coast from abrasion of sea water. The Minister of Marine Affairs and Fisheries who visited the coast in Pekalongan pointed out that the damage along the northern coastal of Central Java reached 67%. The data is reinforced by the results of the Ministry of Marine Affairs and Fisheries Republic of Indonesia (2015) study that along the north coastal of Java has been affected by abrasion/erosion of 6,566.97 ha in 13 districts. The worst affected districts of abrasion/erosion are in Brebes Regency with land affected by an abrasion of 2,115.32 ha. The district with the area affected by abrasion number 2 is Demak Regency with land affected by abrasion/erosion of 1,016.22 ha then followed by Jepara Regency with land affected by abrasion/erosion of 938.73 ha. This condition continues to grow worse, until on June 12, 2015, Republika daily released a news that there are four regions in Central Java that continue to show vulnerable abrasion/erosion. These four areas include Demak, Batang, Kendal and Semarang.

The bad condition of the northern coastal cannot be separated from people's habits that utilize natural resources in excess. Not a few people who make irregularities in the use of coastal ecosystems by exploiting the natural wealth continuously. If these problems analyzed from the causal factors, the destruction of coastal ecosystems is more based on the lack of understanding of environmental literacy owned by surrounding communities. Environmental literacy instilling is no longer merely a gift of knowledge, but has been directed towards the actualization of attitudes and actions [1]; media strategies to improve adult environmental knowledge; understanding of environmental education; the influence of
environmental education on adolescents; instilling long-term value of environmental education; and have careful planning for the improvement of environmental literacy.

The instilling of values and principles of environmental literacy for the community is effectively done in education, because the school has a strategic position as agent of change. Education is one aspect that can affect the world of the future and is the most effective way in shaping a society that has the ability to face challenges in the future [2]. So it will be very effective if the environmental literacy both in the form of actualization of attitudes and actions and also environmental knowledge exercising early in school. This study aims to reveal how students think about environmental issues focused on affective aspects-verbal and cognitive commitment-action plans.

2. Method
This research belongs to descriptive research aimed to know the tendency of verbal commitment and student's plan in facing environmental problem. The study involved 329 high school students scattered from seven districts/cities in the northern coastal area of Central Java, including Brebes, Pekalongan, Pemalang, Batang, Semarang, Pati and Jepara districts. During the research process, the researchers collected data by coming to school, giving middle school environmental literacy survey (MSELS) questionnaires to students, monitoring and analyzing the results of students' questionnaires.

The instrument used in this study is MSELS which has been adapted at several points to suit the existing environmental conditions in Indonesia. Some adjustments made are related to the replacement of animal objects in the questionnaire with the type of animals that exist in Indonesia. Replacement of the topic problem in questionnaire with problem happened in Indonesia at this time. Questionnaire MSELS consists of four domains: (I) ecological knowledge, (II) verbal commitment, (III) environmental sensitivity, and (IV) environmental feeling. This study uses only two variables, namely affective-verbal commitment and knowledge-action strategies. Questionnaire MSELS printed in booklet form. The name of the student is written in code so that the identity is kept secret.

3. Results and discussion
The student's ability to think about the environment must be faced with the fact that there are environmental problems around them. Students who are residing in the northern coastal areas of Central Java will certainly experience various problems such as rob, aberration, and various other problems due to the location of their residence close to the coastal area. To overcome the problem it is necessary to construct a thought about how students will take action (verbal commitment) and make action plan/strategies to overcome existing environmental problems.

3.1. Students verbal commitment in solving environmental issue
The result of the verbal commitment of students in north coastal of Java Island is described in Table 1 below.

| Aspect                                      | Choosing frequency |
|---------------------------------------------|--------------------|
| Aspect                                      | strongly agree     | Agree   | average | disagree | strongly disagree |
| Willing to stop buying some products to save animals’ lives | 57                 | 116     | 103     | 42       | 11                |
| Not be willing to save energy by using less air conditioning | 70                 | 72      | 75      | 74       | 38                |
| Willing to use less water when bathe to save water         | 48                 | 100     | 105     | 45       | 31                |
| Not give own money to help the environment      | 108                | 93      | 58      | 58       | 12                |
Table 1. Cont.

| Aspect                                      | Choosing frequency |
|---------------------------------------------|--------------------|
|                                             | strongly agree | Agree | average | disagree | strongly disagree |
| Willing to walk more places in order to reduce air pollution | 41 | 81 | 107 | 71 | 29 |
| Willing to separate family’s trash for recycling | 79 | 85 | 85 | 61 | 19 |
| Give own money to help protect wild animals | 62 | 121 | 92 | 41 | 13 |
| Willing to use dimmer light bulbs to save energy | 31 | 89 | 121 | 65 | 23 |
| Willing to turn off the water while brushing teeth to save water | 109 | 109 | 61 | 41 | 9 |
| Willing to pass out environmental information about local issue | 57 | 135 | 103 | 23 | 11 |
| Willing to write letters asking people to help reduce pollution | 132 | 104 | 77 | 14 | 2 |
| Willing to ask people who don’t recycle to start doing it | 99 | 124 | 82 | 23 | 1 |

The results of students' thinking on the aspect of verbal commitment/ student expectation to act [3] on environmental issues indicate that the north coastal of Central Java students tend to invite people to help reduce pollution with the highest selection of 132 times. Pollution-related matters become one of the focuses that the student pays attention to. Their understanding of how the effects of pollution become one of the drivers for the emergence of a desire to reduce pollution [4]. Although pollution is a complex concept [5], information on pollution is not unfamiliar to the students. High school students have learned about pollution and the environment in recent curriculum. Students also perform various activities, collect facts and information related to pollution during learning [6]. Students have sufficient information related to pollution and its consequences [7]. The effects of pollution will create troubling thoughts for students so they are moved to want and to invite others in reducing pollution. The student’s experiences with pollution also affect their desire to reduce pollution. They remember and hear what has been experienced and encourage to be kind to the environment [8]. Students experiences related to daily life are factors that affect behavior towards the environment [9]. North coastal of Central Java there is abrasion, accumulation, sedimentation, surface water pollution caused by household wastewater and industrial wastewater [10]. This damage appears to be experienced directly by students and makes them more concerned about the environment.

Willingness to invite others to recycle waste also has a high point. It seems that students prefer to invite and to advise others to be willing to do actions that can reduce the occurrence of environmental damage including waste recycling. Garbage is a serious problem for the northern coastal region due to the discharge of waste disposed through the river. Poor waste management in the community and the abundance of garbage creates anxiety for students. The existing recycling systems are still in great need of improvement and development [11]. This will trigger the desire of students to be able to invite others to recycle garbage. Teachers are a very influential factor on students’ thinking about recycling and environmental protection [12]. High school education practices also include learning related to waste recycling. Students are also familiar with the waste processing that has been taught since primary education. They have been aware of issues concerning waste and waste management [13, 14]. Understanding built on a good foundation of knowledge affects individual responsibility and potential action on the environment [15]. In addition to teachers, the school environment has a role in building
students’ perceptions of their desire to recycle garbage. Students living in a recycling school environment will provide better behaviour than those unaccustomed to recycling [16].

In contrast to pollution and waste, northern coastal Javanese students have a low verbal commitment score on the energy utilization aspect. The result of the student’s response shows a low selection score on the aspect of electricity savings and the use of electronic appliance such as AC with frequency selection of 38 for the strongly disagree category. The low commitment of students in energy is influenced by their knowledge and understanding related to energy. Literacy about energy can strengthen a person to make the right choice in energy use [17]. Energy-related concepts are not easy, many students have difficulty understanding the concept of energy [17, 18]. Especially for energy utilization and conservation aspects, requires a high level of knowledge integration over concepts related to energy sources or energy forms [19]. Further, that most students will have difficulty in analyzing the relationship of energy-related variables [20]. This has impacted their difficulties in applying the concept of energy in various situations [21]. Energy use is also related to social and lifestyle aspects [22]. People living in urban areas have high levels of consumption, including coastal areas [23]. With extreme environmental conditions such as high temperatures will be very difficult to avoid the use of electronic devices such as air conditioning.

3.2. Students action strategies in solving environmental issue

Action strategy refer to how students’ response to specific environmental issues. In this term, students is given an issue about land-use management in which the farmland owned by citizen was sale to commercial developer to become mall. Here the result of student’s choice to react about that issue present in figure 1.

![Figure 1](image_url)

Figure 1. Students’ score in action strategy.

Students mostly choose to write the senator to prohibit the sale of the land. writing a letter to senator actually need low of physical effort but need a higher thinking skill to make an opinion that influence someone’s tough. Writing skill need elaborate installation in the mind [24]. The ability to write some letter also indicate that students achieve critical component in successful learning [25]. Writing activity will promotes critical thinking skill and makes the case most convincingly [26]. When students write,
their writing and thinking improve. It proved that student have high in cognitive and critical thinking skills. The second student’s choice for farmland issues is organized group of citizen to make coalition that influence city officials to reverse their decision in selling farmland. In this case, students in coastal area of Northern Java seems have a good relationship with the local government. Students also aware that government play the critical role for managing city and solve any problem related to environment. It need legal act to strengthen the refusal of mall construction. Those problem can’t be burden to the citizen because the people’s concern about environmental issue is quite low. Furthermore, Environmental actions and ethics is needed to be developed in Indonesia, including northern coastal of Java [27]. Indeed the strong policy and good government is needed. The lowest score of students’ action strategy is the choice to make anonymous call to mall’s owner to sabotage the construction equipment of mall. This option actually not familiar to students. It sounds bad when frightening someone with anonymous call. Most of Students in coastal area of central java have a good culture especially when communicate with a person who older than him/her. As we analyzed, the student answer in farmland issue mostly in a conceptual area. They pick a safe choice that have low risk to them. They tried to avoid confrontation that may drag them to bad situation in future.

4. Conclusion
Basically, this study shows little of how the students think about the environment. The research show that north coastal students of central java more concern in pollution and recycling issues related to environmental problem that occur in their surroundings. The students also prefer to write letter to the local government to solve any environmental issue. However, the results of this study are expected to be a reference for teachers, schools and local governments to be more concerned in developing students’ skills in environmental literacy so they become agents that can overcome environmental problems in the vicinity.

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