

Situation of Environmental Education in Senior High School Programs in Indonesia: Perspectives from the Teachers of Palembang

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ABSTRACT

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Environmental literacy helps to address key challenges in providing sustainable development for the developing third world countries. This can be qualified based on the active practice of promoting environmental awareness inside the classroom and innovative curriculum change among many educational systems. To provide a glimpse of the current situation of environmental education at the senior high school level, this pioneering qualitative research study based on grounded theory was conducted for Indonesia by interviewing 21 experienced teachers from Palembang. Two main themes were identified from the coded responses of the teachers on the semi-structured questions framed for this study. These themes were (i) teachers' insights on the current teaching pedagogies in Indonesia and how these strategies are used to integrate environmentally important issues and (ii) the prospective of improving the environmental education in Indonesian high schools. Teachers interviewed in this study agree that (1) a more outcome-based strategy should be applied in teaching environmental knowledge in the classroom, (2) educational policies that raise awareness about environmental problems in Indonesia, especially the increasing bad air quality in the country, is seen as both a priority and an opportunity and (3) students attitudes, society's apathy and ignorance, and government's implementations are the challenges in developing environmental education subject for most Indonesian schools.

Keywords: Adiwiyata program, air quality, content analysis, Generation Z, sustainable development goals (SDGs)

INTRODUCTION

Although it sounds cliché, the notion that the current younger generation will inherit the harsh outcome of environmental degradation brought upon by economic development might still hold true. In return, they are expected to be the prime forces that would help alleviate the piling of enormous environmental problems nowadays. Several studies have reported perceptions of the younger generation on topics related to the impacts of the current environmental problems (see Zsoka, Szerényi, Széchy, & Kocsis, 2013; Oguz, Çakci, & Kavas, 2010; Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007) particularly coming from students of the developing and least developing countries. For instance, the survey of students has indicated the increasing awareness of

students on the physical impacts brought about by climate change (Rahman, Hossain, Zaman, & Mannan, 2018; Freije, Hussain, & Salman, 2017), plastic pollution (Hammami, Mohammed, Hashem, Al-Khafaji, Alqahtani, Alzaabi, & Dash, 2017), renewable energy (Edsand & Broich, 2019) and invasive species (Schreck-Reis, Marchante, Freitas, & Marchante, 2013). Such awareness can be attributed to the value of environmental education efforts invested by many countries worldwide.

Educating the 21st-century learners with the right amount of long-term knowledge and competitive soft skills is a wise investment for any developing nation that envisioned a more sustainable livelihood and a better quality of life for its community. This idea served as a

backbone of many international policy discourses, i.e. the United Nations Sustainability Development Goals (SDGs) 4 that aim to develop “Quality Education” for all the citizen of this world (Kopnina, 2020). The emergence of these new ideal standards of education every country should provide to its younger generation necessitated active discussions in environmental education or EE (Fraser, Gupta, & Krasny, 2015; Potter, 2009). The development of local projects related to environmental education has been demonstrated to increase the awareness of students and their environmental appreciation (Arioder, Arioder, Quintana, & Dagamac, 2020; Bergman, 2016; Ballantyne, Fien, & Packer, 2001). Furthermore, Environmental education is also the main constituent that is heavily context dependent in social, cultural and environmental situations that are sustainable development (Jeronen, Palmberg, & Yli-Panula, 2016). Its goal is to highlight on “education for sustainability” which is not only for environmental education but for poverty alleviation (Tilbury, 2003), socio-economic development (Jickling & Wals, 2008), even population and gender issues (Larson, Castleberry, & Green, 2010). It is also expected to promote environmentally sustainable societies throughout the Asia-Pacific region (Bhandari & Abe, 2000). Unfortunately, some countries in Asia are focused more on national development than social and ecological sustainability (Furihata & Ninomiya-Lim, 2017).

Indonesia is considered to be the world’s biggest Muslim-majority country with a significantly large population size. With a really high number of various ethnic groups that can speak more than 700 living languages, it is obvious that Indonesia is one of the most culturally diverse countries in the world. Historically, the concept of EE in Indonesia can be traced back to Suharto’s authoritarian regime. For nearly 30 years in governance, his administration achieved Indonesia’s most rapid economic growth in the late 1960s including stronger environmental efforts for the country (Nomura, 2009). In spite of criticisms that the Ministry of Environment received at that time, environmental education was still initiated in Indonesia, beginning with university education. At present, both the state-owned and private universities in Indonesia are engaging in training and strengthening the research thrust of the country geared towards finding appropriate environmental solutions to the increasing problems related to many socio-economic problems of a developing third world country. Among these efforts are (i) courses that teach environmental impact assessment for university staff members, (ii) trainings on population and environment for elementary, secondary high school teachers, and (iii) production of informative educational materials that

could be disseminated to the public. Furthermore, it was mentioned in the book chapter published by Nomura & Suyono (2014) that leading universities in Indonesia have been offering undergraduate environmental programs, namely environmental planning and management, environmental laws, geographic information system, ecology etc. Although environmental education could be integrated into many university courses in Indonesia, the primary, elementary, and high school level in the country do not yet have an independent subject related to environmental education. Rather, scouting is encouraged as an outdoor EE activity (Nomura, 2009). Environmental issues are incorporated into the curriculum system in almost all subjects taught at the secondary level of education in Indonesia (Prihantoro, 2015). Green school (Adiwiyata) programs are also established for the country (Warju & Soenarto, 2017). A recent paper of Aprilia et al. (2018), has recognized the development of the so-called “Kitakyushu Eco Model/KEM” on education and social awareness sector at a visual impairment school in Bandung.

With the continued rising of environmental issues such as loss of biodiversity, climate change, and pollution over the last decade that triggered preparedness for natural calamities and management of risk disasters in tropical Southeast Asia, it is expected that schools in Indonesia have implemented novel teaching strategies to raise environmental awareness and risk attitudes among the youth sectors. These expectations are valid enough, especially now in an era where so much fake news appears in many digital platforms, and many students are vulnerable to misinformation (Roozenbeek & Van Der Linden, 2019). Hence, this qualitative study based on grounded theory is initiated to document the narratives of high school science educators in an urbanized metropolitan city of Palembang in terms of the challenges, practices, and current situations of environmental education in the senior high school (Grade 10-12) classroom. With this study that the researchers would like to communicate to the public the acumen of the noble workforce and how they contribute to the demands of an environmentally sustainable future of Indonesia.

METHOD

Participants

A total of 21 senior science high school teachers were purposively sampled from six schools in Palembang City. These teachers were selected from a total of ca. 200 science teachers coming from 22 registered schools in Palembang based on (i) their years of teaching experience (should have at least a minimum of two years); (ii) personal commitment and availability to participate in the series

of interview that was conducted for this study; and (iii) on their familiarity in incorporating environmental issues in their teaching practice. All of the participants were informed about the goal of the interviews and they volunteered to participate in the duration of the interview sessions needed for the study.

Interview Questions

A semi-structured interview was employed for this study. The whole interview process is divided into three-parts discussion components namely, (i) profiling component – where the participants are asked about the length of their teaching experience and how they feel about their current teaching experience with the millennial students; (ii) integrating component – where the participants answered questions regarding their strategies in incorporating environmental issues in their topics in class and the limitations of environmental education in the current system of education and lastly; (iii) prospecting component – where the participants conveyed their opinions on the needs to improve the awareness of students on environmental issues and how the school should cope-up with the speedily evolving educational landscape.

Content Analysis

During the interview process, which took between 15 – 45 minutes per participant, a voice recording was employed. All the participants were initially informed about the data recording process and they were assured of the privacy of information that they will divulge during the course of the interview. After the teachers willingly gave their consent for the recording, the interview commences with the interviewer jotting down important notes that the participants have been actively tackling in an Aide-memoir. The notes taken from the Aide-memoir validated by the voice recordings of all the interviewers were transcribed verbatim. Then, the content of the responses was coded, categorized, compared and was condensed to draw out the essence that are reported in this case study.

RESULTS

A total of 21 teachers (7 males and 14 females) from public senior high schools of Palembang participated in this qualitative study. All these teachers have a teaching experience between 6 - 35 years. The results of the interviews right after analysing their content are shown in this section with some verbatim quotations that were directly translated from Bahasa to English for reference. Two main themes appeared from the set of semi-structured research questions conducted. Theme one is

about the teaching pedagogies in Indonesian school and the need for it to be reformed, and the second theme is more about prospecting the fate of environmental education for the country.

Theme 1: The Need to Recalibrate Teaching Pedagogies

Features mentioned by the teachers included their insights about how strategies in teaching high school students in Indonesia should start to change and their personal experiences in discussing environmental issues in the classroom.

Category 1: The best teaching strategy to give information about environmental issues for the “Generation Z” students

Teacher06 with six years of experience have indicated:

“The best approach now to teach topics related to the environment are a mixture of contextualized teaching and information technology since in the nearby future all information will just become digital and books will become out-dated.”

20 experienced teachers have agreed on a common point of shifting the traditional classroom instruction.

Teacher01 commented:

“A teaching style that would at least encourage most students is an approach where information are not teacher-centered but more of student-centered. Senior high school students will not learn effectively in the passive traditional setting nowadays. Since they are more active now in finding their information on their own, an approach that would encourage them to collaborate and directly discuss their knowledge would be a better way to increase their awareness about environmental issues.”

Teacher11 added:

“A problem based method would be ideal where students would focus on finding a solution to an environmental problem given to them. This can train them to become proactive social problem solvers that can identify the causes and effects of a particular environmental problem in Indonesia.”

Teacher17 shared:

“Telling the students about theory is okay but it bores them, if you want to really tell them how the impacts of environmental problems like bad air quality or climate change, letting them discuss about their personal experience would engage them. This can be a good approach to also increase the student’s creativity because I think being creative is one of the most important skills in the future.”

Three experienced teacher (Teacher 07, Teacher10, Teacher 13) also highlighted the same point about innovating the teaching strategy that they should do in the classroom in particular they elaborated by saying the following respectively.

“Make them comfortable inside the classroom or motivate them to learn about the environmental topic probably by incorporating strategies like letting them watch environmental documentary videos.”

“Introducing first some conditioning activities that would encourage them to actively participate in the topic of the day would be a good strategy. Even at their age, I still conduct some educational games and students are still like kids, they enjoy it.”

“I bring them on the field for some activities so that whatever they learn inside our classroom they can apply it in practical scenarios that can happen in the real world.”

Category 2: Experience in teaching environmental related issues on their subjects. Mixed teaching experiences have been gathered from the responses of the teachers regarding how they incorporate environmentally related issues on their subjects. 19 teachers have shared that they actively incorporate environmental issues in their class.

Teacher02 shared:

“When the smog coming from forest fires began to occur in Palembang I took the initiative from myself to incorporate the environmental topics and I think I am doing it now during the last 10 years of teaching science. However I do not usually go into telling them the details, but more of just giving them bits of information.”

Teacher03 with 35 years of experience in teaching shared:

“I did provide information about petroleum, starting from the contents therein and the negative impacts of the combustion process.”

Teacher10 with 18 years of experience shared:

“During the second semester at Grade 10 level, I teach about the ecosystems and here I tell them how the environment has been changing because of human interventions. I usually tell them to find information on this topic relating to our topics in ecology and what I usually do is to ask them to do presentations.”

While two respondents have said that although they do not directly incorporate environmental issues, they

still reminds students what they need to do once they are outside the classroom.

Teacher08 shared:

“I have not experience teaching them about environmental issues in our class but I give them simple information once in a while like telling them how they can help in preventing outdoor air pollution.”

Teacher12 also commented:

“Unfortunately I never discussed directly about environmental problems during our class hours, but when students ask me especially during the smog in Palembang I tell them what I know.”

Category3: The urgency to incorporate environmental issues in the classroom. All teachers agreed that it is very relevant and timely to start modifying the school system and integrates environmental issues in their topics. The common narratives from all the teachers highlighted that environmental education at the senior high school level is very urgently needed so that students can become environmentally aware and be part of the solution and even further recommended that it would be better if as early as kindergarten, environmental education would be already incorporated in the teaching instructions.

Theme 2: Challenges and Opportunities for EE in Indonesia

The scope of this theme tackled the insights of the teachers on the present limitations and the hopeful future on environmental education for the senior high school system.

Category 1: The challenges. All of the teachers interviewed in this study are incongruent to point out three levels of challenges. Firstly, they have identified the challenges coming from the government’s educational system. Some important responses include that there are no constant information that is reported to people, the local governments usually will only start to act when the situations got worse, citing the case of the recent forest fires in Palembang and even if there are trainings available to teachers there are some who are uninterested to participate. The second challenge is the people’s values. Interesting points raised were the Indonesians’ lack of awareness, apathy, and ignorance about environmental problems in their community. Lastly are students’ attitudes they characterized to be hooked in their gadgets or smartphones making many students prioritize over knowledge or information. They also observe that

students' psychosocial behaviour nowadays relies more on finding their own sense of belongingness rather than being concerned with their surroundings.

Category 2: The opportunities. In spite of not yet being formally incorporated in the senior high school curriculum, all the interviewed teachers have given various responses about initiatives that their schools have conducted to educate the students about the environment, namely; solid waste management campaign to teach students to properly segregate waste products, tree planting activities and compost making and seminars the Department of Environment were invited to give a talk to the student. All of the 21 teachers told the researchers that these initiatives are done independently by schools based on the implementing guidelines of the so-called Adiwiyata (Green School) Program. Based on the current paper trail, three basic principles are the core values of the Adiwiyata program. These are participatory, sustainability, and educative. The function of the Adiwiyata program is for all students to be involved in all school activities or activities in the direction of a healthy environment and also able to avoid negative environmental impacts.

Interestingly, we observed that the teachers are very enthusiastic in giving suggestions on changing the current senior high school curriculum to integrate a full environmental education in the classroom. Some important responses include

Teacher 05 commented:

“Religion plays a vital role in most of our curriculum. If we accentuated how obligatory for us to take care of the environment based on our religious belief, this could be a good starting point to motivate the students.”

Teacher 08, who previously said of having no previous experience of incorporating environmental issues on her class suggested:

“We need to immediately modify how our curriculums are developed. We can adjust some class periods to cater to some special subject like Global Environmental Problems.”

Teacher 14 said:

“I am thinking two approaches. Either include environmental problems as a central theme in their lessons with the approval of the school's director or propose a separate class that will focus only in Environmental Education for Sustainable Development.”

DISCUSSION

The 21 teachers that have been interviewed are classified as an experienced teacher with more than 5 years of teaching experience in senior high school (from Grade 10-12 based on Indonesian educational system). All of them are in unison in observing that the Indonesian students have been evolving over the last years. This generation of students are more socially active and more technologically inclined where the information handed to them is always “at the tip of their fingers”. Students in this era of digital age obviously get more engaged with technology (Ainley et al., 2008). This has also been raised by the interviewed teachers in this study, when they noticed how books are becoming out-dated in their classrooms. Hence, the blackboard lecture-type seems to be an obsolete tactic to encourage students to raise social awareness about pertinent environmental issues. A more outcome-based education seems to be what the teachers are identify with being a better strategy in this rapidly changing educational landscape because in today's education system, the concept of the learning environment has gained a new meaning. In this regard, it is emphasized in the study of Seval et al. (2018) that new approaches should be adopted for the arrangement of classrooms and classroom equipment and that the classroom environment should be just a part of this new learning environment. Although there are differences in the ways Palembang teachers have been teaching environmental issues, all of them support the idea that there is a need to improve the pedagogies of teachers to tackle practical environmental problems and find sustainable ways to solve them. The perspectives of Palembang teachers on creating more interactive strategies for students are actually supported by other studies that showed environmental awareness can be inculcated to students through incorporating “out of the box” practices i.e. using mobile applications (Olatumile, 2019; Uzonboylu, Cavus, & Ercag, 2009), arts and place-based approaches (Ferreira, 2020; Gray & Thomson, 2016), constructivist teaching approaches (Arioder et al., 2020) or even integrating them in communities that work for environmental sustainability (Robina-Ramirez & Medina-Merodio, 2019). These strategies have not been fully practiced so far in many senior high schools in Indonesia hence; it would be very interesting to test if such innovative methods can be applied in the country's educational system.

Beside the teaching strategies, the teachers all agree that the current curriculum should also be changed. They find that having a separate Environmental Education subject incorporated in the school curriculum could be a promising way to improve not only student's awareness

but also the teachers' environmental literacy. These suppositions of the teachers are grounded on studies that have investigated the effects of environmental education (EE) as a separate course. Like for instance, Hsu (2004) stated that EE courses significantly promoted student's responsible environmental behaviour. In a more recent study of Saribas et al. (2017), EE courses can also at the same time develop educators' environmental literacy and self-beliefs. Moreover, the resonating perspectives of the teachers we have interviewed seems to agree with a recent review of Parker (2017) about the Indonesian curriculum and how there is a misalignment between the curriculum's objectives and teaching practice. Most of the teachers agree that religion indeed plays a role in their teaching practice especially when it comes to the environment. This explains why most of them take the initiative to remind the students of taking care of the environment because it is not just their civil duty but a part of their religious duty too. However, Parker (2017) was critical in pointing out that only the Geography subjects in schools are the one that deals with the relationships between economic growth and environmental protection. This again probably explains the varying experience of the science teachers we interviewed on whether or not in their long years of teaching experience, have they focused on incorporating and emphasizing environmental topics in their class.

In spite of the limitations in teaching it formally inside the classroom, initiatives coming from Indonesian schools to at least inculcate awareness and environmentally friendly practices to the students. In a paper of Situmorang & Tarigan (2018), they have discussed how a junior high school in Salatiga used bottle gardening to observe environmental awareness of their students. This paper is just an example of activities that have been stated by the teachers in the result section i.e. tree planting activities, solid waste management on campus, and such initiatives can be attributed to policies initiated by the government during the last years. An example is the government's Minister of Environment program Republic of Indonesia Number 05 in 2013. This policy concerns with the implementing guidelines of the Adiwiyata (Green School) Program that states that adiwiyata schools are schools that are caring, and are cultured in the environment. This program aims to encourage the creation of knowledge, as well as school community awareness in environmental preservation. The purpose of the Adiwiyata school which in general explains in creating a caring and cultured school community in the environment by: (1) creating better conditions for schools to become a forum for learning and awareness of all school members including students, teachers, parents/guardians of students,

and also the community environment for the creation of environmental conservation efforts (2) the school community is also responsible for making efforts to save the environment and sustainable development and (3) encourage and help schools to be able to participate in carrying out government efforts to preserve the environment in sustainably for the sake of the interests of future generations (Nurhafni, Syahza, Auzar, & Nofrizal, 2019). Recent studies have shown that the Adiwiyata program has been influential in building student's eco-literacy in some school areas in the country e.g. Banda Aceh (Desfandi, Enok, & Disman, 2017); Malang (Landriany, 2014); and Semarang (Caddafie, Martuti, & Rudyatmi, 2017).

This qualitative study has discovered that in Palembang, most teachers have mentioned that the most pressing environmental issue right now in the province is air pollution caused by smog from forest fires, burning of solid waste, smoke belching from cars and smokes released by industrial plants during the last years that can cause serious health problems to them and their students. In the interview sessions, the most common environmental problem they highlight is Kabut Asap (smog) and Polusi Udara (air pollution). Perhaps, the air pollution in the area has been one of the main problems that have arisen as a product of continued urbanization growth in the city. Air pollution has also been a topic during the interview where teachers admittedly recognized that they are not directly aware of certain policies that the local government units are doing. They have noticed that government actions are just done during the time periods when the air quality in Palembang is considered worse. This led to some personal initiatives of some teachers to integrate the topic of air pollution in their subjects. For example, an experienced teacher stressed out that the air pollution problem has been his "wake-up" call to introduce the topic of environmental issues in his class. Another case is a teacher who talks about the combustion process in her chemistry lesson and integrates it with the current situations of air quality in Palembang.

CONCLUSION

The 21 teachers interviewed in this study all agreed that this generation has different learning styles and that the digital age plays influences on how these students would view their responsibilities in protecting nature. The teacher's role now is to continuously innovate their teaching practices so that they can teach students about protecting the planet. This duty is something they consider not just a moral obligation but as a fundamental religious duty. So far, there are no strict implementations about environmental education in the senior high school level in

Palembang, Indonesia. However, teachers all agreed that environmental awareness in Indonesia should already be highlighted as early as at the Kindergarten level.

The problem with air pollution and recent air quality in the communities of Palembang is the most demanding environmental topic that they can use to incorporate environmental awareness among their classes. The great need to start building a new curriculum for Indonesian senior high school is welcomed with eagerness by all of the teacher respondents. Dialogues and complete retooling of the curriculum where new and experienced teachers can undergo public trainings about implementing environmental education is highly recommended possibilities for Indonesia. Development of curriculums that are based not only using traditional classroom instruction but also will promote active environmental participation of students are ways to address the production of environmentally proactive and literate students. Therefore, through the right educational practices, this new generation of Indonesian students can become the change their country envisioned for a more sustainable future.

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