Climate Change Knowledge and Behavioral Response of Negros Oriental High School Grade 12 Students

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The study aimed to determine the knowledge level and the affective and behavioral response of senior high school students to climate change. The results of the study served as a basis for teachers to develop instructional interventions that would strengthen the students' knowledge and response on environmental education. An adapted questionnaire was administered to grade 12 students (male $n = 91$, female $n = 150$) of Negros Oriental High School in the school year 2019–2020. The results of the study showed that a larger number of students have "average" knowledge level on climate change. Furthermore, the students also exhibited "agreeable" affective and behavioral response to the actions related to climate change. For the sources of information regarding climate change, social media ranked first. Moreover, the senior high school teachers provided positive response to the results of the study as basis for their instructional material development.

Keywords: *environmental education, climate change, knowledge level, behavioral response*

INTRODUCTION

The healing of the environment is the ultimate goal of environmental education (Bennett, 1989). Classroom instruction is one way of teaching environmental education. Students have the capacity to be directly involved in the improvement of the environment. Climate change is perceived as the leading multigenerational problem mankind is facing in the twenty-first

century. With the advent of modern technology and industrial activities, the scientific community recognizes that profound impact of these activities on the earth's climate (Anderson, 2012). This global temperature rise is a phenomenon that is within our immediate future, and it greatly concerns the children of today as they are considered to be the most vulnerable group. In recent studies, in the country and abroad, students have been afflicted with the lack of knowledge and misunderstanding about climate change (Çimer, Çimer & Ursava, 2011; Awusi & Asare, 2016; Akrofi, Antwi & Gumbo, 2019; Lopez, & Malay, 2019). Needless to say, one's knowledge on climate change is a key factor in order to start working on a possible solution to the problem or find ways for adaptation. Truthfully, climate disruption can be evitable with sufficient and appropriate climate education (Gaillard, 2012).

Climate change and its effects present the greatest challenges for mankind and the planet they live in. This ongoing phenomenon has been a threat to global development (UNDP, 2007). Although climate change is caused by naturally occurring events, man-made causes like industrial pollution, combustion of fossil fuels, and deforestation have certainly contributed to the significantly rapid growth of this problem. The increase of greenhouse gas release into the atmosphere can be attributed to human activities such as fossil fuel combustion and industrial by-products (IPCC, 2007).

Meanwhile, deforestation is considered as a primary factor in weakening the carbon dioxide adsorption in the environment. The effects of climate change are explicitly observed today: extinction of animal and plant life, sea level rise, extreme weather conditions, and shifting of agricultural patterns (Pitpitunge, 2013). Thus, climate change has become a global concern not just for international organizations, and government and educational institutions but also for the common people going about their everyday lives (Ochieng & Koske, 2013; Zerrudo, Salain, & Salain, 2017).

With these current issues in mind, there is a need to know the real-time scenario of the students who will continue the fight towards a healthier planet. This is possible with the aid of educators who take it as their ardent task to impart sufficient knowledge to students in order to guide their actions and perceptions.

The general objective of the study was to determine the knowledge level, and the affective and behavioral response to climate change of Negros

Oriental High School grade 12 students in the school year 2019–2020. The results of the study served as a basis for instructional material development of teachers in the aforementioned school. Specifically, the study aimed to achieve the following:

1. determine the knowledge level of students regarding the basic concepts of climate change and its causes, effects, and mitigation;
2. measure the level of affective and behavioral response of students to climate change;
3. identify the most prevalent sources of climate change information among the students; and
4. gather instructional plans from senior high school teachers, as response to the collected data.

The advent of the twenty-first has uncovered a variety of scientific and technical complexities on the issues that adversely affect the natural environment. Thus, public literacy on these threats is a high necessity, and through dissemination of information, the general public can make informed and accurate decisions about environmental issues. Education is one of the highly recommended avenues to find answers to this climate change dilemma (Sheffield et al., 2017; Vargas-Callejas, et al., 2018). Climate change education contributes to the development of students' knowledge and competence to find solutions, and respond and adapt to the problem.

Nonetheless, students play a crucial role in the propagation of information regarding climate change, and primarily, the students rely on their own acquired knowledge to explain somehow complex scientific terms and constructs to the people in their community and beyond. Self-understanding and self-awareness are also achieved when students participate in environmental education activities (Harker-Schuch & Bugge-Henriksen, 2013; Cacundangan & Garcia, 2017).

The primary question in environmental education is one's relationship to the environment (Ojomo et al., 2015). The essence of this relationship is shown in the way people act as well as the choices and decisions that they make pertaining to their environment. The crucial factor leading to these actions and decisions is one's values, which also reflect one's cognitive processes, and social and ethical development. As an interdisciplinary subject, environmental education focuses on the varied instructions that are

created inside the classroom. The cognitive, behavioral, and affective aspects of education are subsumed under environmental education. The basis of the theoretical premises linking these three aspects is examined in this paper.

The following excerpts are an exemplification of how the concept of building values among students has remained a key element within environmental education:

> *Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness amongst people, their culture and biological and physical surroundings. Environmental education also entails practice in decision making and self-formation of a code of behavior about issues concerning environmental quality. (IUCN, 1970)*
>
> *Environmental education aims to provide opportunities to acquire the knowledge, values, attitudes, commitment and skills to protect and improve the environment; encourage pupils to examine and interpret the environment from a variety of perspectives; arouse pupils' awareness and curiosity about the environment and encourage active participation in resolving environmental problems. (NCC, 1990)*

Based on these definitions, it is clear that environmental education can contribute to the preservation and protection of the environment. All the aforementioned definitions highlight the importance of values as the center of environmental education. The emphasis on values formation of the students during classroom instruction is highly observable. This supports the idea that environmental education helps learners to acquire a personal view enhanced by moral perspectives which affect the way they act and behave towards their environment. Hines, Hungerford, and Tomera (1987) proposed environmental education as a technique to modify behavior among students in terms of responding to and acting on their environment.

The behavioral change model suggests that if people were better informed, such knowledge would lead them to become more aware of environmental problems and would motivate them to act in an environmentally responsible manner (Akintunde, 2017). This model promotes the notion of a direct link between knowledge and attitudes, and attitudes and behaviors. Simply put,

when knowledge is increased, good attitude towards the environment is also developed (Figure 1).

Figure 1. Behavioral Change Model

Reid (2019) expressed that climate change education is vital in order to reconstruct teaching and learning in response to the climate emergency the planet is facing today. He focused on the fundamental questions on climate change education: (1) What should and should not happen with climate change education? (2) Who is responsible for ensuring quality climate change education takes place? (3) How can change in educators' practices be brought about to ensure climate change education is educational, fit for purpose, and effective. These questions suggest that it is not enough to simply provide information about the changes in the environment, but it should also important that the information provided complements with the students' acquisition level. Oversby (2015) drew evidence from a European network and its activities with schools across nations, assessing the situation of climate change education in the curriculum. He found that science teachers were using innovative pedagogy in delivering lessons on environment and climate change. Rocha (2019) conducted a theoretical analysis of the relationship between environmental education, education for sustainable development, and education on climate change. The results of the study showed that "quality education" and "action against climate change" were two primary themes in environmental education since the teachers shared that they had difficulties in incorporating lessons regarding climate change. The inclusion of environmental education in the classroom discussion across subjects was necessary in order to strengthen the knowledge and response of the students.

Ojomo et al. (2015) examined the knowledge and attitude of university students and government officials about the causes and effects of climate change as well as the priority given to this issue in Nigeria. The findings

revealed that 90% of the participants believed that human activities were a primary driver of climate change, with no statistically significant difference between the perceptions of the students and the officials. Kabir et al. (2016) conducted a cross-sectional survey by administering a structured questionnaire to 6,720 participants in Bangladesh. The results showed that majority of the participants (91.9%) had observed changes in rainfall patterns in the last decade, while 97.8% stated that their health care expenditure had increased due to extreme weather events. Lubos and Lubos (2019) assessed the knowledge, attitudes, practices, and actions of settlers along the river banks of Cagayan De Oro, consisting of 22 villages. The results of the study indicated that the settlers had moderate knowledge of climate change. However, this knowledge did not translate to the conservation, protection, and sustainability of their immediate environment.

Harker-Schuch and Bugge-Henriksen (2013) investigated the influence of people's knowledge on their opinions regarding climate change through a survey conducted with 188 adolescents aged 16–17 in Austria and Denmark. The results showed a statistically significant relationship between knowledge and construction of opinion about climate change. Students with higher number of correct answers opined that humans had a significant role in causing climate change and that both the people and government should work together to minimize its causes and mitigate its effects. Rahman et al. (2014) investigated the role of different demographic profiles and academic attainment on the level of "informedness" of Bangladesh high school students. Through the constructed Climate Awareness Index, the survey results indicated that socioeconomic factors such as quality and type of school, gender, religion, and academic achievement influenced the students' knowledge regarding climate change. Furthermore, Sulistyawati et al. (2018) conducted a cross-sectional study among 508 Yogyakarta adolescents through a structured questionnaire to provide evidence on climate change and health knowledge among adolescents. The study revealed that the students had "low and inconsistent understanding" of the concepts related to climate change and its impact on health.

METHODOLOGY

The study employed an adapted survey questionnaire (Lopez & Malay, 2019). The three-part survey was used to determine the (1) knowledge level; (2) affective and behavioral engagement of students towards climate change; and (3) the common sources of information regarding climate change. The first part was a 20-item true or false quiz divided into four major topics: basic concepts of climate change, and its causes, effects, and mitigations. The second part was a 10-item, 4-point Likert scale that aimed to test the affective and behavioral engagement of students with the issue of climate change (i.e., strongly agree [4], agree [3], disagree [2], and strongly disagree [1]). The third part was also a 10-item 4-point Likert scale used to determine the most common sources of climate change information among the students (often [4], sometimes [3], rarely [2], and never [1]).

The respondents of the study were grade 12 students of Negros Oriental High School in the school year 2019–2020. The students were from the different senior high school tracks and strands (Table 1). The grade 12 students had taken the subject courses Disaster Readiness and Risk Reduction, Earth and Life Sciences, Understanding Culture, Society, and Politics, and other areas that include climate change-related discussions. Before the administration of the questionnaire, permission was obtained from the school principal of Negros Oriental High School–Senior High School Curriculum. Parental consent was also obtained prior to the administration of the questionnaire to all grade 12 students. A confidentiality agreement was conducted between the researcher and respondents. The collected data were tabulated and interpreted using item analysis, frequency and percentage, and total weighted mean.

Table 1

Demographic Profile of the Grade 12 Students in NOHS SY 2019–2020

Track and Strand	Sex	Age						Total
	M	F	16	17	18	19	≥20	
S-AD	6	11	0	9	7	1	0	17
TVL	19	23	0	21	12	5	4	42
ABM	14	36	0	30	19	1	0	50
GAS	28	13	0	16	16	7	2	41

HUMSS A	9	24	0	19	10	2	2	33
HUMSS B	10	25	0	21	14	0	0	35
STEM	5	18	1	13	9	0	0	23
Total	91	150	1	129	87	16	8	241

S-AD Sports and Arts and Design, TVL Technical-Vocational Livelihood, ABM Accounting and Business Management, GAS General Academic Strand, HUMSS Humanities and Social Sciences, STEM Science and Technology, Engineering, and Mathematics

After the collection of data from the respondents, the senior high school teachers (n = 5) who taught climate change topics were then interviewed to gather their feedback and response in regards to the identified knowledge level and behavioral response of the grade 12 students to climate change. The responses gathered from the teachers were considered as the instructional interventions needed in order to improve the knowledge level and affective and behavioral response of the students to the present global problem.

RESULTS AND DISCUSSION

Table 2 shows that based on the 60 percent criterion reference for the 20-item test observed in the school, 16.60% (n = 40) of the students had "below average" (score of 11 and below) knowledge level regarding climate change, 41.08% (n = 99) had "average" (score of 12 to 14), 28.63% (n = 69) had "above average" (score of 15 to 17), and 13.69% (n = 33) had "excellent" (score of 18 to 20) knowledge on the issue. The results showed that the knowledge level of the larger number of students was moderate. Some local and foreign studies had also shown that many teenagers had average knowledge level of climate change (Çimer, Çimer & Ursava, 2011; Awusi & Asare, 2016; Akrofi, Antwi, & Gumbo, 2019; Lopez, J., & Malay, C., 2019). These findings suggest that adolescents need further instruction and exposure with regard to environmental education.

Table 2

The Frequency of Grade 12 Students (N = 241) across Knowledge Levels

Description	Score Interval (%)	Frequency	Percent	Mean	SD
Below average	<59–59	40	16.60	10.05	3.83
Average	60–73	99	41.08	13.02	0.82
Above average	74–87	69	28.63	15.86	0.82
Excellent	88–100	33	13.69	18.61	0.71

Out of the 20 items, based on percentage, students who scored between 12 and 14 were classified as having average level knowledge. The data implied that a larger number of students had moderate intellectual understanding of the concepts associated with climate change. The results suggest that the knowledge absorption of students on climate change-related topics was insufficient in order for them to be active participants in finding solutions to this present problem (Akrofi, Antwi & Gumbo, 2019). It could be noted, however, that a number of students still showed a poor level of knowledge regarding the causes, effects, and mitigations of the case at hand. This number, if taken into a wider spectrum, could mean that a significant portion of the population in the community within and outside the school did not have ample knowledge regarding climate change (Ojomo et al., 2015). Nonetheless, there was also a good percentage of students who had above-average to excellent levels of knowledge regarding the concepts revolving climate change.

The following sections provide an analysis of the scores of the students as regards their knowledge levels. The 20-item quiz was divided into four parts, each of which containing the following five items: (1) basic concepts, (2) causes, (3) effects, and (4) mitigations. Table 3 shows the number of students who responded correctly to statement under the "basic concepts" section. When viewed individually, item 17 of the "basic concepts" got the lowest turnout with only 31.76% (n = 91) of the students who answered "False." This could imply that the students had limited knowledge of the different sources of renewable energy (Sheffield, 2017). Renewable energy is essential in lessening the use of carbon-emitting materials in the production of electricity and other energy-dependent activities.

Table 3

The Frequency of Students (N = 241) Answering Correctly on the Climate Change Questionnaire

Statements	Freq.	Percent
Basic Concepts		
1. The weather is always changing, especially over the short term, while climate is the average of weather patterns over a longer period of time.	233	96.68
5. Global warming is an increase in the Earth's average surface temperature from human-made greenhouse gas emissions.	209	86.72
9. Emissions refer to greenhouse gases released into the air that are produced by numerous human activities.	214	88.80
13. Fossil fuels are sources of nonrenewable energy.	179	74.27
17. Unrenewable energy is energy that comes from naturally replenished resources, such as sunlight, wind, waves, and geothermal heat.	91	37.76
Causes		
2. Methane is a hydrocardon gas highly active in decreasing the greenhouse effect in the atmosphere.	76	31.54
6. Increased release of carbon dioxide and nitrous oxide lessen the effects of climate change.	143	59.34
10. Burning of fossil fuels like coal and oil can decreases the concentration of atmospheric carbon dioxide.	154	63.90
14. Volcanic eruptions are natural phenomena that contribute to climate change.	200	82.99
18. Chlorofluorocarbons contribute to the protection of the ozone layer.	103	42.74
Effects		
3. The planet's average surface temperature has risen about 2.0 degrees Fahrenheit over the past decades.	192	79.67
7. Glaciers and ice sheets are melting and hence have decreased in mass.	190	78.84
11. The increase in atmospheric temperature has minimal effect on plants.	119	49.38
15. Droughts and heat waves (periods of abnormally hot weather lasting days to weeks) everywhere are projected to become less intense.	133	55.19
19. Hurricane-associated storm intensity and rainfall rates are projected to increase as the climate continues to warm.	187	77.59
Mitigations		

4.	Access to low and zero carbon energy solutions, such as solar, wind, and geothermal energy can help lessen the causes of climate change.	210	87.14
8.	Investing in sustainable transport can reduce emissions of greenhouse gases.	191	79.25
12.	Targeting the sources of deforestation ensures forests continue to provide environmental, social, and economic benefits.	159	65.98
16.	Increasing GHG emissions from landfills can lessen the effects of climate change.	118	48.96
20.	Promoting practices that reduce land degradation issues can reduce greenhouse gas emissions.	216	89.63

Meanwhile, in the "causes" category, item 2 had the least number of correct answers, as only 76 (31.545) of the students answered "False." This result suggests that the students were not aware what methane gas was and what effects it could create (Falsario, 2014). Items 6 and 18 also generated poor turnout. Both of these items had cited gases that contribute to climate change. It could be noted that with the number of gases present in the atmosphere, students had a hard time distinguishing gases that contribute to climate change.

Furthermore, item 11 of the "effects" section garnered only 49.38% (n = 119) of students plotting "False." The poor turnout in this item could mean that the students were not aware of the effects of climate change to other organisms aside from human beings (Gaillard, 2012). Moreover, the grade 12 students also had difficulties in realizing the adverse effects of climate change to the weather system as the results in item 15 illustrates. The effects of climate change to the natural sources and environment had been an untapped topic as the bulk of the delegated information regarding climate centered on its effects on human beings and the immediate and concrete environment.

Nonetheless, in the "mitigations" category, item 16 only received 48.96% (n = 118) of students identifying it as false. Despite the constant use of climate change-related terms, the results could imply that the students were still unfamiliar with such scientific terms or unaware of products that may increase the release of harmful gases to the atmosphere (Bangay & Blum, 2010; Osama et al., 2017). This result implied that the grade 12 students needed stronger vocabulary and understanding of terms that are related to climate change in order for them adjust their actions and eventually be more environment-friendly.

An item analysis showed that the average number of students who correctly answered the "basic concepts" category was 185.2 (76.85%). Significantly, only 135 (56.10%) of the students answered the "causes" category correctly. Then, 164.2 (68.13%) and 178.80 (74.19%) of the students correctly plotted the "effects" and "mitigations" categories, respectively. Among the four sections, the questions pertaining to the causes and effects of climate change were not correctly answered by a significant number of students. It could be further shown that almost half of the students were not able to identify the causes of climate change. This implies that the students were unknowingly contributing to climate change without giving further thoughts to their actions (Harker-Schuch & Bugge-Henriksen, 2013; Ogunsola, Araromi & Adeshina, 2018). Moreover, one-third of the student population was not able to identify the effects of climate change. Thus, these students were highly vulnerable to the effects of climate change due to the lack of precautionary measures (Falsario, Muyong & Nuevaespania, 2014). Moreover, one-fourth of the students were not able to identify the mitigating activities that can minimize the causes of climate change. This number may be reflective of the human contribution to climate change-driving activities (Falsario, Muyong, & Nuevaespania, 2014).

Table 4 presents the affective and behavioral responses of the grade 12 students on climate change. Overall, the students were found to moderately agree to all the climate change-related statements. The results indicate that most of the students believe that climate change is a real phenomenon. On the other hand, the students had suggested that climate is a new occurrence when, in fact, climate change has been an ongoing phenomenon (Rosidin & Suyatana, 2017). The response in item 3 generated a "strongly agree" category, which implies that the students were willing to take actions in order to mitigate the causes of climate change. Furthermore, the students also expressed a strong desire to take immediate actions to counter climate change (Oruonye, 2011). They also showed a strong sense of social responsibility as they were not only concerned about themselves but also the welfare of their fellow human beings. With regard to the behavioral engagement of the students, they had shown a strong desire to ask questions to better inform themselves about climate change. The grade 12 students also exhibited initiative to learn updates, current news, and information about climate change. They also displayed carefulness in disseminating information regarding climate change

and would not promote fake and unverified information. The students also showed strong willingness to participate in advocacies aiming to lessen the effects of climate change (Chang & Pascua, 2017; Zerrudo, Salain & Salain, 2017; Ogunsola, Araromi & Adeshina, 2018).

Table 4

Affective and Behavioral Response of the Grade 12 Students to Climate Change

Statements	Weighted Mean	SD	Description
1. I believe that the effects of climate change are real.	3.93	1.35	SA
2. I believe that climate change is a new societal and environmental problem.*	1.72	1.23	SA
3. I am hopeful that there are actions that we can implement to lessen the effects of climate change.	3.83	1.28	SA
4. I believe that immediate actions should be done about climate change.	3.71	1.23	SA
5. I will ignore the signs of climate change until I can experience it firsthand.*	3.56	1.19	SD
6. I always ask questions about climate change.	3.51	0.94	SA
7. I read news and updates about climate change only if my teacher will tell me.*	2.73	0.93	DA
8. I spread information about climate change without verifying.*	3.02	0.93	DA
9. I am seriously concerned with climate change and its effects.	3.80	1.13	SA
10. I will participate in climate change-related advocacies and activities.	3.72	1.07	SA
Overall	**3.08**		**A**

*The statements are interpreted oppositely from the weighted mean range as the ideal response should be scale 1.

Scale	Description	Weighted mean range
1	Strongly Disagree	1.00–1.75
2	Disagree	1.76–2.5
3	Agree	2.51–3.25
4	Strongly Agree	3.26–4.00

Overall, the respondents had exhibited ideal responses to the ongoing problem. The students had given great importance to equipping themselves with correct and verified information regarding the causes, effects, and

mitigating measures of climate change. Today's youth are very vital to the advocacy of mitigating the causes of climate change and spreading adaptation activities to lessen its effects.

Table 5 illustrates the grade 12 students' common sources of information on climate change. It could be noted that most of the media and materials listed scored high in terms of their availability to the students (Anderson, 2012; Falsario, Muyong & Nuevaespania, 2014; Ojomo et al., 2015). Notably, "social media" ranked first among the students as the primary source of information regarding climate change. This may be caused by the social media revolution in this Generation Z. The high output across all media and materials may suggest that climate change and its related concepts are abundant in the real-time scenarios whether in the outer world or online (Oruonye, 2011; Rosidin & Suyatana, 2017).

Table 5

Common Sources of Information on Climate Change

Mediums/materials	Weighted Mean	SD	Description
Classroom	3.57	1.02	Often
Television	3.81	1.23	Often
Social Media	3.83	1.24	Often
Internet Browsing	3.77	1.18	Often
Books and journals	3.31	0.97	Often
Magazines	2.92	0.94	Sometimes
Newspapers	3.38	1.08	Often
Family and relatives	3.20	0.94	Sometimes
Peers and friends	3.00	0.95	Sometimes
Movies	3.12	0.93	Sometimes

Scale	Description	Weighted mean range
1	Never	1.00–1.75
2	Rarely	1.76–2.5
3	Sometimes	2.51–3.25
4	Often	3.26–4.00

Below are the vignettes from science teachers (n = 3) and teachers handling climate change-related subjects (n = 2) responses. These illustrate the possible actions that the teachers in NOHS are going to implement in order to improve the knowledge level of students. The interview questions gauged the response of the teachers to the current scenario of the students

through instructional material formulation and classroom instruction delivery (Ochieng, 2010; Ochieng & Koske, 2013; Osama, et al., 2017; Trendell, 2017).

Science Teachers:

1. Construct instructional materials with data, simulations, and models
2. Teach climate literacy with the use of ICT devices
3. Conduct symposiums
4. Enhance the visual instructional materials used in the classroom
5. Immerse the students in communities hit by calamities
6. Let the students take an advocacy campaign
7. Present current statistics on climate change

Teachers handling climate change-related subjects:

1. Present a documentary or video showing the effects of climate change to the class
2. Conduct a research activity or science investigative projects
3. Integrate climate change even if it is not stated in the curriculum guide
4. Expose students to firsthand observation like field trips when possible
5. Tap speakers and organizations where students can volunteer to do activities related to climate change
6. Administer peer group discussions and brainstorming activities

The results of the interview showed that both groups of teachers had given great importance to improving the knowledge level of the students regarding climate change (Bangay & Blum, 2010; Boon, 2016). The teachers also showed a positive response to the challenge of enhancing their instructional materials and delivery in order to strengthen the students' knowledge and behavioral response to climate change (Dal et al., 2015; Herman, Feldman & Vernaza-Hernandez, 2017; Monroe, 2017).

CONCLUSIONS AND RECOMMENDATIONS

Overall, a considerable number of students showed "average" knowledge level regarding climate change. However, almost half of the total population had difficulty identifying the causes of climate change. The students had exhibited agreeable responses towards their willingness to take part in mitigating the effects of climate change and identifying adaptation activities. The various media and materials were found to be common sources of information regarding climate change, with "social media" as the most common source. The senior high school teachers of NOHS had shown positive responses to the results of the research and will use them as basis for improving instructional material development.

Based on the results of the study, the researcher would recommend the following:

1. The students should utilize all sources of climate change information in order for them to be more knowledgeable with the terms and constructs related to climate change. It is also suggested that the students take initiative in participating in climate change reduction advocacies and programs.
2. The teachers handling climate change-related subjects should devise instructional interventions that can build the knowledge level of the students, especially in the following areas: (1) non-renewable energy and their sources; (2) atmospheric gases that contribute to climate change and their sources; (3) the effects of climate change on plants and other living organisms and on the weather systems; and (4) the by-products of human activities that contribute to climate change. Moreover, the teachers should also provide a timeline of the climate change data since the start of the industrial revolution. Lastly, the teachers should make use of social media platforms as a way of disseminating climate change information; nevertheless, they should teach the students how to verify information they get from online sources.
3. The school heads and administrators must promote the integration of climate change in the delivery of classroom discussion. They

should also encourage the teachers to develop instructional materials geared towards the improvement of the knowledge level of students pertaining to climate change.

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