

# The Level of Awareness on Climate Change of Pre-Service Teachers in One State University in the Philippines

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## Abstract

Climate change is recognized as one of the primary socio-scientific issues that teachers of all ages could choose to resolve, given its contentious and political nature. Indeed, raising awareness helps amplify the need to deal with the issue of climate change. The study's objective was to evaluate the extent/level of awareness on climate change of a sample of pre-service teachers from a constituent campus of one state college within the Philippines. The study utilized a descriptive research design and accumulated information from the respondents using an online survey. It utilized 300 pre-service teachers of Batangas State University ARASOF-Nasugbu from different year levels and sections. The study revealed that they are more female and first-year respondents taking teacher education programs. Pre-service teachers are extremely aware of climate change. Most of them strongly agree that climate change requires immediate action and are extremely aware of the factors that affect the level of their awareness. They believe that documentary videos on YouTube was the main factor that affects their awareness. The majority agreed with the different medium-that were used to enhance their awareness of climate change and marks the internet as the main medium in gaining climate change awareness.

**Keywords:** climate change; pre-service teachers; climate change awareness.

## 1. Introduction

Over a few decades or more, substantial changes in usual weather conditions happened, known as climate change. Such as conditions are getting to be hotter, wetter, or drier. Climate change is recognized from natural weather changes by this longer-term design. The planet becomes warmed every time it absorbs energy from the sun or when atmospheric gasses hinder the earth from transmitting into space, or simply the greenhouse effect.

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With natural and human activities, climate change is affected. Climate change impacts everything, from where we live, the water we drink, and the air we breathe [1].

Climate change impact is exceptionally apparent in the Philippines. And these impacts increasing ocean levels, an increment within the recurrence of extraordinary climate occasions, rising temperatures, and extreme rainfall, because of the country high vulnerability to natural catastrophes (cyclones, landslides, floods, and drought), reliance on climate-sensitive natural resources, and huge coastlines which are home to all country's big cities, and populations. The Philippines is found within the world's most cyclone-prone zone, with a yearly normal of 19-20 cyclones of about 7-9 making landfall. The ocean levels are rising speedier than the global average, raising the risk of storm surges and the dangers in low-lying zones [2].

Mitigation measures to reduce greenhouse gas emissions due to human activities to the environment and adaptation efforts to adapt systems and economies to withstand the impacts of climate change have become the most common methods used to combat climate change [3]. Subsequently, mitigation necessitates education to learn how to change the behavior and show people that as responsible individuals: they have a critical role to play in addressing the current sustainability issues. Climate change is one of the primary socio-scientific issues that teachers of all ages could choose to resolve, given its contentious and political nature [4]. Therefore, teacher education programs must help teachers to look into how to improve access to quality education and bring changes needed on achieving sustainable development [5].

Among preservice teachers (PSTs) in Australia, climate change awareness and understanding was reported as unacceptably low [6]. Additionally, the PSTs discovered unconscious of climate change and the mitigation measure [7]. Nonetheless, these cases were opposite to UNESCO's development [5] objective, to progress quality education needed in accomplishing sustainable advancement.

In line with the foregoing discussion, pre-service teachers should make themselves aware of climate change as they could make a difference in the life of their prospective students. The study's primary purpose is to assess the level of awareness on climate change of a sample of pre-service teachers from a constituent campus of one state university in the Philippines. In addition, the study determines the level of awareness of students concerning climate change. Furthermore, it identifies the factors that will have an immense impact on students' consciousness about climate change. Lastly, it examines the medium of information students discern as significant in enhancing their knowledge and awareness regarding climate change.

## **2. Review of Related Literature**

Developing countries including the Philippines are highly vulnerable to climate-related weather events. Typhoons will become more violent, sea levels will rise, and storm surges will increase resulted from climate change. Forty-five percent of Filipino who live in an urban area are at risk because of floods. Furthermore, climate-related products in the Philippines are likely to reduce agricultural productivity. Severe weather disasters are already having an effect on property and vital infrastructure in the Philippines. The World Bank report focuses on climate change program innovation as well as policy and funding discrepancies. The research revealed that climate change has an immediate and direct effect on the Philippines. Also, the study discovers

that the increased fund on climate change programs has a direct positive to the country's development goals. The study recommends that to strengthen the country's leadership and transparency, monitoring is essential. Climate change policies and practices must also be evaluated and reviewed to ensure that climate change goals turn into action. Furthermore, the study suggests that climate change understanding and adaptation are critical for achieving inclusive development [8]. Mendelsohn and Williams [9] examined the undergraduate level of awareness of climate change and sustainable development at the University of Ibadan and the Ladoke Akintola University of Technology, Ogbomoso in Oyo State, Nigeria. The study revealed undergraduate students' level and the factors that affect their awareness, and their sources of information on the environment and sustainable development. The study also found that climate change education should be organized and incorporated in school curricula at all levels; and preparation, re-training, empowerment, or enlightenment of the responses of participants in climate change should take place without prejudice, discrimination, or marginalization of any kind. Youth participation in any disaster risk reduction activities could increase when they are well-informed about climate change. However, scarcity of information appears on their level of consciousness. These could explain why youth are always behind in the process of DRR. The study of Barreda [10] implied that the type of channel that greatly influenced the awareness of the younger students is the mass media, family, training, and seminars. It shows that older students are more likely to be easily influenced by information from the internet and education. The results have possibly resulted from the exposure of the higher student to both educational content knowledge and their use of the internet as it is part of their study. On the other hand, the results from the younger students emphasized in the study that the role of families, training and seminars are vital in increasing the level of their awareness towards climate change. The study of Jeong, Gómez, Núñez, Cepeda and Prieto [11] offers an analysis of climate change awareness-raising of preservice teachers (PSTs) in a university science classroom with a flipped class intervention. The study used 109 students with 55 students in the control group (Group 1) and 54 students in the experimental group (Group 2). It relied on a questionnaire to determine any significant difference in the students' awareness of climate change for the two groups and before and after course completion. Findings showed the improved awareness of climate change in PSTs after a flipped class intervention, and, therefore, PSTs were more willing to engage in climate change teaching.

### **3. Materials and Methods**

In this study, the researchers utilized a descriptive research design. To collect information from the respondents, an online survey was conducted. Three hundred (300) Pre-service teachers of Batangas State University ARASOF-Nasugbu were surveyed from different year levels and sections.

The 20-item survey questionnaire was adopted from Jeong, Gomez, Nunez, et.al. In addition, the questionnaire was divided into four different sections. The first part of the survey consisted of questions that answer the demographic profile of the respondent. The three remaining sections consisted of twenty Likert scale items in which respondents mark their agreement with each statement. After the collection of data, researchers examined the survey result.

#### 4. Findings and Discussion

##### 5. Respondents' Sex and Year Level

Respondents are selected randomly from different year levels (1st Year, 2nd Year, and 3rd Year) among students taking education programs at Batangas State University ARASOF-Nasugbu. As recorded in the table, there are 300 pre-service teachers chosen to be respondents of the study. More than three-fourth was female (83.67%) and less than one-fourth were male (16.33%). Additionally, almost half (143) of the respondents were first-year students.

**Table 1:** Respondents' sex and year level.

Sex	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	Total	Percentage (%)
Male	23	18	8	49	16.33%
Female	120	92	39	251	83.67%
Total	143	110	47	300	100%

##### 6. The Level of Awareness of Pre-Service Teachers in terms of Climate Change

Table 2 presents the level of awareness of pre-service teachers in terms of climate change. Generally, pre-service teachers are moderately aware of climate change as indicated by a composite mean of 4.37. Although respondents disclosed extreme awareness in 6 items and moderate awareness in only 4 items, the weighted means of the 6 items are just very slightly above the weighted mean for moderate awareness, thus the composite mean falls on the moderate awareness range.

**Table 2:** Level of awareness of pre-service teachers in terms of climate change.

Item Indicators	WM	VI	R
1. Climate change is a long-term change in the usual weather pattern on Earth.	4.54	Extremely Aware	6
2. Human activities are the primary factor in climate change.	3.75	Moderately Aware	10
3. In the last century, Earth's temperature has increased by about 1 degree Celsius.	4.64	Extremely Aware	2
4. Sea ice and glaciers are melting in the arctic.	4.01	Moderately Aware	9
5. The average sea level is expected to rise.	4.10	Moderately Aware	8
6. Climate change causes extreme weather and floods.	4.59	Extremely Aware	3
7. Climate change affects the production of goods and services.	4.57	Extremely Aware	5
8. National and global research agencies on climate change exist.	4.25	Moderately Aware	7
9. Climate change is a threat to humanity.	4.58	Extremely Aware	4
10. Climate change requires immediate action.	4.67	Extremely Aware	1
Composite Mean	4.37	Moderately Aware	

Particularly, the respondents believe that they have very high awareness on climate change requiring immediate action with a weighted mean of 4.67. They have also extreme awareness that the Earth's temperature increases by 1 degree Celsius in the last century with a weighted mean of 4.64. They also manifest extreme awareness with respect to climate change causing extreme weather and floods with a weighted mean of 4.59. Further, extreme awareness is indicated on the item that climate change is a threat to humanity with a weighted mean of 4.58. Other items that the respondents demonstrate extreme awareness include climate change affects the production of goods and services, climate change is a long-term change in the usual weather pattern on Earth and that climate change is a threat to humanity.

These findings imply that pre-service teachers are mindful about the physical environment and may trigger them to engage in both personal and external activities about environmental conservation. This may also mean that these prospective teachers can integrate climate change awareness in the teaching and learning process.

Respondents are moderately aware that the average sea level is expected to rise with a weighted mean of 4.10. They are also moderately aware that sea ice and glaciers are melting in the arctic with a weighted mean of 4.01. This maybe a consequence of the fact that all of them have not seen sea ice and glaciers. Additionally, the respondents are also only moderately aware that human activities are the primary factor in climate change, which underscore that they do not concretely understand the role of human society in climate change.

The study also examined the *factors that influence the level of awareness on climate change among pre-service teachers* and they are displayed in Table 3.

**Table 3:** The factors that influence the level of awareness on climate change.

Item Indicators	WM	VI	R
1. Information about climate change in books.	4.22	Strongly Agree	5
2. Seminar that focuses on climate change that educates students.	4.41	Strongly Agree	2
3. Article posted on a social media platform.	4.32	Strongly Agree	4
4. Documentary video on YouTube.	4.50	Strongly Agree	1
5. Engagement of government body concern on climate change in universities.	4.35	Strongly Agree	3
<b>Composite Mean</b>	4.36	Strongly Agree	

The table shows factors that impact the level of awareness of pre-service teachers on climate change. Documentary video on YouTube ranked first with a weighted mean of 4.50 verbally interpreted strongly agree. The second to the highest rank is the statement that a seminar that focuses on climate change educates students strongly affects respondents' awareness with a weighted mean of 4.41. This is followed by the indicator that the engagement of government body concern on climate change in universities strongly contributes to the climate change consciousness of pre-service teachers with a weighted mean of 4.35. Next is the description that the

article posted on a social media platform- strongly influencing climate awareness with a weighted mean of 4.32. Lastly, climate change information in the books also influences the awareness of pre-service teachers strongly with a weighted mean of 4.22.

The table shows the gathered data in the respondents' evaluation about the factors that impact the level of awareness of pre-service teachers on climate change. Documentary video on YouTube ranked first with a weighted mean of 4.50 verbally interpreted strongly agree. The second to the highest rank is the statement that a seminar that focuses on climate change educates students strongly affects respondents' awareness with a weighted mean of 4.41. This is followed by the indicator that the engagement of government body concern on climate change in universities strongly contributes to the climate change consciousness of pre-service teachers with a weighted mean of 4.35. Next is the description that the article posted on a social media platform- strongly influencing climate awareness with a weighted mean of 4.32. Lastly, climate change information in the books also influences the awareness of pre-service teachers strongly with a weighted mean of 4.22.

The data and its results were related to the study conducted by Barreda (2018) that the role of universities; was hugely impacted in increasing or improving students' understanding of climate change. There appears to be a progression within the seen factors that are; critical in raising youth climate change awareness. That is from the experiences of every individual to schooling to government exercises. In addition, the study also emphasized the value of using knowledge education campaign materials as reference materials to raise students' awareness.

Table 4 shows the medium of information that are significant to the development of awareness of pre-service teachers on climate change. It can be gleaned from the table that there are different sources from which respondents obtain information on climate change.

**Table 4:** The Medium of Information Used for Climate Change Awareness.

Description	Weighted Mean	Verbal Interpretation	Rank
1. I have access to information on climate change awareness through the subjects in my secondary school days.	4.26	Strongly Agree	2
2. I have access to information on climate change awareness through courses taken at the university.	4.10	Agree	4
3. I have access to information on climate change awareness through school reading materials.	4.18	Agree	3
4. I have access to information on climate change awareness through the internet.	4.45	Strongly Agree	1
5. I have access to information on climate change awareness through seminars and workshops that I attended.	3.76	Agree	5
Composite Mean	4.15	Agree	

The respondents strongly agreed on the statement that they have access to information on climate change awareness through the internet that turned out to be the first in ranking with the weighted mean of 4.45. Then, the indicator that I have access to information on climate change awareness through the subjects in my secondary school days ranked second with the weighted mean of 4.26 and a verbal interpretation of strongly

agree. The statement, I have access to information on climate change awareness through school reading materials ranked third (3) with a weighted mean of 4.18 and a verbal interpretation of agree. Meanwhile, statement number two (2), I have access to information on climate change awareness through courses taken at the University ranked fourth with a weighted mean of 4.10 and a verbal interpretation of agree. Lastly, the indicator that I have access to information on climate change awareness through seminars and workshops that I attended turned out to be the last one with the verbal interpretation of agreeing and a weighted mean of 3.76. Therefore, the table shows that the information from the internet and subjects in secondary school is significant to climate change awareness; however, the respondents have the least information access to climate change awareness from the seminars and workshops they have attended.

According to Mavrodieva and colleagues (2019), the internet and social media sites have made it possible for people to engage with and share knowledge about climate change. Aside from that, the research shows that the internet raises public awareness of climate change. Furthermore, the internet and social media platforms will contribute to the debate on climate change and affect policy decisions related to climate change.

## **7. Conclusions**

The study explored the level of awareness of a sample of pre-service teachers on climate change. It moreover inspected the factors that influence the awareness level of pre-service instructors on climate change. In addition, the study examined the different mediums of communication that are used to enhance pre-service teacher's climate change awareness. The findings of the study led to the following conclusions: the profile of the respondents showed a greater number of females than males; the majority of the respondents were first-year students. Furthermore, it revealed that pre-service teachers have moderate awareness of climate change, and YouTube documentary videos, seminars, campaigns, articles, and books about climate change affect the level of climate change awareness of Ppre-service teachers immensely. Lastly, the internet and subjects in secondary school are significant in developing their level of awareness on climate change.

## **8. Recommendations**

The following recommendation is endorsed based on the findings and conclusion of the study. Since climate change is recognized as a huge problem, and pre-service teachers used in the study have only a moderate level of awareness, the college may take more serious efforts in enhancing their level of awareness. This may be done through curriculum integration, seminars and through the distribution of information materials on climate change. As the respondents were delimited to pre-service teachers only, future study to be conducted may include other groups and type of respondents. Lastly, developing this kind of study will increase the knowledge of society, which may turn out to be a good investment in miyigating the worse impact of climate change.

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