

UNDERSTANDING CLIMATE CHANGE PERCEPTIONS AMONG UNIVERSITY STUDENTS: A QUALITATIVE ANALYSIS

Dominance

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ABSTRACT

There has been an increase in Climate change awareness since the 1980's and the people in developed countries are taking measures to deal with its adverse effects. Even the United Nations Organization (UNO) recognizes the impact Climate change causes on both social and economic development and that combating towards its adverse effects has been declared a global sustainability goal (SDG) for the UNO. The developed countries are actively working towards this SDG, however there a vast amount of unawareness observed within the developing and underdeveloped countries' population, who show less concern towards the risks associated with Climate change. Our aim of this research is to investigate what perspectives the young student population in a developing country (Pakistan) keeps regarding the Climate change problem. For this qualitative study, nine semi-structured and open-ended questionnaires about Climate change awareness were formulated and about 112 students from University of Karachi participated in this qualitative study through convenient sampling. The responses from those interview questions were analyzed based on the themes that were occurring frequently. Some of the themes which were generated from the answers were; lack of awareness, moderate risk perception, accurate awareness, high knowledge, moderate awareness, positive impact on mood, negative impact on mood, negative impact on mood and cognition, lack of cooperation, and pro-environmental behavior. Themes such as lack of awareness and pro-environmental behavior were occurring the most frequent as compared

to other significant themes identified from the participant's responses, which does indicate that individuals showed a lack of awareness regarding information of climate change yet also showed interest towards pro-environmental or environmentally friendly practices if given the feasibility.

Keywords: Climate change, college students, qualitative study, semi-structured questionnaire

Introduction

Climate change has been defined by Weber (2010) as a systematic change in average conditions over time. This change is tough to detect and see without numerical measurements, making it difficult for cynics to believe that climate change is happening (Weber, 2010). Climate Change is a global phenomenon, which means its significance over our daily lives cannot be undermined and that its adverse effects pose a public health risk. According to World Health Organization (WHO), Climate change causes serious damage to basic human living requirements, such as unsanitary water conditions, food shortage, and impure air, Global warming etc. Climate change also represents many scientific and technical hazards, which further involves our social and mental factors, such as personal experiences, affect and emotions, intentions, trust, values, and worldviews. (Slovic,2000)

Climate change itself is an ongoing process which is mostly driven by human activity in the form of increased emissions of greenhouse gases and into the atmosphere (IPCC,2013). The global, environmental and societal implications of a changing climate demand immediate action at both individual and societal levels in order to mitigate potentially serious consequences. However, individuals find it difficult to understand the complexities underlying the science of climate change, as well as what could be the long and short term affects over them. Even researches indicate that highly educated adults also possess limited knowledge about climate change and its global impacts. (Sterman &Sweeney, 2007)

Moreover, when media attention towards climate change issue increased, so does the growing confusion among

populations regarding the causes of climate change issue increased.

Literature Review

Research studies involving both students and the public revealed several of these misconceptions, including: (1) confusion between weather and climate (Gowda, 1997), (2) identifying stratospheric ozone depletion as the primary contributor to global warming (Bostrom. 1994; Gowda et al. 1997), and (3) linking unrelated pollution effects (e.g., litter, photochemical smog, and radioactive waste disposal) to global climate change. (Gowda, 1997; Keller 2006; Papadimitriou 2004; Read, 1994). Furthermore, misattributing short-term weather fluctuations to long-term climate factors may result in difficulty understanding the concepts of deep time or the timing and relationship between geophysical events that have occurred during the Earth's history (Dodick and Orion 2003).

Due to these confusions and misinformation regarding the phenomenon of climate change, there has been a surge of integrating climate change education in many educational curriculums from the 1990s in order to raise concerns for the harmful effects of climate change. Higher education has a critical role in educating college students about global climate change. That is why climate literacy among college students is essential as they'll be facing situations where they'll have to make decisions related to environmental aspects and when they'll have a solid understanding of about global climate change and human interactions, they'll be more likely to take preventive and pro-environmental actions in their personal and social lives. (Rebich and Gautier, 2005).

There is another factor which influence the way individuals receive and maintain beliefs about climate change; that is their socio-cultural backgrounds, that are highly diverse and difficult to study objectively (Dunlap and Jacques 2013; Fabiyi and Oloukoi 2013). Climate change perceptions are locally situated and is shaped by individual's attitudes and beliefs' (Bunce, 2010; Carlton and

Jacobson 2013). People are good observers of their environment and that those who have experienced the adverse effects of climate change in their local areas are likely to perceive the problem of climate change as a risk. The level of concern differs according to where people live, such as in an urban or rural area and whether they are adapted to adverse climatic events (Ayanlade and Jegede, 2016).

It has been also found that university student perception about climate change also vary according to the educational field they're enrolled in. A study conducted on Nigerian university graduates concluded that graduates in environmental sciences had more class experience on climate change than those in other disciplines (Ayanlade and Jegede, 2016). Another study on two universities of south-western USA concluded that the faculty from science, agriculture, and natural resources had significantly greater perceived knowledge about climate change compared with engineering, business and hotel management, and education and educational outreach faculty (Beck, 2013).

Limited research has been conducted on the understanding of individuals and communities for their role in climate change perception and adaptation, and is much less in the developing countries student population. (Whitmarsh et al. 2013). Research on risk perceptions of climate change in developing countries is crucial as these nations need a versatile ability to react to climate changes (Shisanya and Khayesi, 2007). Therefore, this qualitative research aims to explore the perceptions and awareness of climate change amongst the student population of a developing country like Pakistan, and would want to investigate if the young student population perceive the insidious yet adverse effects of climate change as a risk. By exploring these perceptions of climate change, this research seeks to explore other factors influencing the conceptual framework of climate change as well as contribute to the existing literature on the topic and provide insights and suggestions for the future researchers.

weather stations are great help in terms of predicting weather; also using satellite imagery for analyzing crop health and also the quality of soil. Moreover, the HAI data analysis will include some of the major tools that are predictive analytics (S. V. S. Ramakrishnam Raju, 2022). Through Predictive Analytics one can analyze the data and also estimate the general water needs and also analyzing historical data. Hence, this can further be used for irrigation scheduling. Also, Drip & Precision Irrigation can also be used in water thrift cropping utilizing minimum water with maximum yield. AI Technology can also assist in water control (Olutobi Adeyemi, 2017). For sustainability and efficient water use, sustainability practice can help in making strategies for applying practice and focus ultimately on using less water.

The sustainable farming can be another technique if applied can promote efficient use of water. Most of the literature showed that crop rotation can further help in better production. Crop rotation and diversification can be beneficial in long term for sustainable farming. Geographic Information System (GIS) is another method to examine and mapping of water resources. GIS can also benefit and assist in investigating spatial data pertaining to irrigation (Yacob Abrehe Zereyesus, 2021). Irrigation management can also include adopting Smart Irrigation System such as adopting automation structure to regulate water delivery and on time. Based on real time data this data can be analyzed further for decision making process. The Decision Support System (DSS) is being adopted by various sources for in order to help farmers in decision making process for resource allocation, sustainable farming and planting. The initial HAI program in Sindh can successfully help in sustainable growth and agriculture practices (Brian E Mennecke, 1996). Most of the literature review shows that HAI program can also be beneficial for Sindh's water productivity and sustainable growth levels.

Methodology

Research Design

A qualitative approach was used to collect data from students about their perceptions and awareness towards climate change. The data was collected by constructing nine interview questions through two pilot studies and selecting participants through convenient sampling method.

Sample

112 participants, from the premises of University of Karachi, participated in this qualitative research.

Measures:

Informed Consent Form

The informed Consent form contains a brief introduction about the study they are participating in, they were informed about keeping their credentials anonymous and that their participation in this study is voluntary. Under the Informed Consent Section, there is a demographic section, which collects the information about participant's age, gender, education level, and department name.

9-item Semi-Structured Questionnaire of Climate Change Awareness

About nine open ended and semi-structured questions regarding climate change awareness were formulated which were themselves the outcome of two pilot studies conducted before the actual research.

Data Collection

The participants were approached and selected conveniently. They were given the informed consent forms along with the semi-structured questionnaire of climate change awareness in a noise-free classroom. The participants were encouraged to write their answer more detailed rather than yes and no. Once they were done filling the descriptive questions, they were properly debriefed about the qualitative study and were thanked for their participation.

Table 1: Themes generated in first pilot study.

S.No.	Category	Questions	Themes	Frequency
1	Knowledge	1. What is your understanding about global warming?	Lack of awareness	22
		2. What information do you have that is necessary to prepare for the impact of climate change?	Mediocre Awareness	
2	Risk Perception	3. How do you think climate change is impacting different regions of the world?	Moderate risk perception	19
		4. What are some of the significant factors contributing to climate change in your opinion?	Inaccurate risk perception	
3	Impact on Mood & Energy	5. How does spending time in nature typically make you feel?	Positive impact	22
		6. Have you ever noticed changes in your mood during particularly hot or extreme weather?	Negative impact	
		7. Have you ever faced anger due to climate change?	Negative impact	
		8. Does climate change affect your mood or energy?	Positive impact	
4	Impact on Decision Making	9. Have you ever considered how climate changes might influence your decisions?	Influence decision making	23
5	Pro-environmental Behavior	10. Have you ever reduced your energy consumption in response to what you have learned about climate change?	Mediocre pro-environmental behavior	26
		11. Are you willing to pay higher prices for products or services that are environmentally Friendly?	Compromised pro-environmental behavior	

Table 2: Themes generated in second pilot study.

S.No.	Category	Questions	Themes	Frequency
1	Knowledge	1. What is your understanding about Global Warming?	Moderate knowledge	21
2	Risk Perception	2. How do you think climate change is impacting different regions of the world?	Accurate Risk Perception	22
		3. In your opinion what are the different factors contributing to climate change?	Accurate risk perception	
3	Impact on Mood & Energy	4. How does spending time in nature typically make you feel?	Positive impact	24

		5. How does climate change affect your mood or energy?	Positive Impact	
4	Impact on Decision Making	6. How does climate change influence your decisions?	Negative Influence	26
5	Pro-environmental Behavior	7. Would you take any measures for your energy consumption (electricity, water, fossil fuels etc.) with the knowledge that you currently have regarding climate change?	Shows pro-environmental behavior	24
		8. Let's say; Store A gives you plenty amount of plastic bags to carry your groceries home. While Store B charges Rs.10 for every bag (which is biodegradable and can be planted into a seed later) that they provide you. Which store would you prefer to shop and why?	Shows no pro-environmental behavior	
		9. In your opinion, what Precautionary measures could be taken to lessen the impact of Climate change?	Moderate Pro-environmental Behavior	

Table 3: Themes generated in the main research study

S.no	Category	Questions	Theme	Frequency
01	Risk perception, Awareness	How do you think climate change is impacting different regions of the world?	Lack of awareness Moderate risk perception Accurate awareness	45 37 30
02	Awareness, knowledge	What is your understanding about global warming?	Lack of awareness High knowledge	84 28
03	Awareness, knowledge	In your opinion what are the different factors contributing to climate change?	Moderate awareness Lack of awareness Accurate awareness	37 65 10
04	Impact on mood	How does spending time in nature typically make you feel?	Positive impact on mood	112
05	Impact on mood	How does climate change affect your mood or energy?	Positive impact Negative impact	53 59
06	Impact on cognition	How does climate change influence your decisions?	Positive impact on mood Negative impact on mood and cognition	23 89
07	Pro-environmental behavior	Would you take any measures for your energy consumption (electricity, water, fossil fuels etc.) with the knowledge that you currently have regarding climate change?	Lack of cooperation Lack of awareness Pro-environmental behavior	18 30 64

08	Pro-environmental behavior	Let's say; Store A gives you plenty amount of plastic bags to carry your groceries home. While Store B charges Rs. 10 for every bag (which is biodegradable and can be planted into a seed later) that they provide you. Which store would you prefer to shop and why?	Pro-environmental behavior Lack of cooperation	80 32
09	Pro-environmental behavior, awareness	In your opinion, what precautionary measures could be taken to lessen the impact of climate change?	Pro-environmental behavior Lack of awareness	74 38

Discussion

The purpose of this qualitative study was to explore and investigate the perceptions of student population of developing country (Pakistan) has regarding the Climate change issue and if they perceive it as a risk. For this study, about nine semi-structured questions were formulated in which the participants were asked about climate change and its affects as well as if they would engage in environmentally friendly tasks if given the opportunity.

To formulate these questions, brainstorming sessions were held and many semi-structured questions were suggested to be added for the respondents. Then after the restructuring and selection of open-ended yet comprehensible questions, about eleven questions were finalized and first pilot study was performed. About 27 classmates performed the pilot study, and themes were generated by the researchers for the thematic analysis. However, due to many contradictory themes and subthemes arising, another pilot study with the 27 classmates was performed again, and about nine questions containing the most comprehensive themes were selected to conduct the main qualitative research. About four participants were selected for this study through convenient sampling method. They were given the informed consent form along with the nine semi-structured questionnaire, which they filled while sitting in a noiseless classroom. The participants were encouraged to write detailed answers to the open-ended questions. After that, the thematic analysis is applied to

the respondent's answers.

Some of the themes which were generated from the answers were; lack of awareness, moderate risk perception, accurate awareness, high knowledge, moderate awareness, positive impact on mood, negative impact on mood, negative impact on mood and cognition, lack of cooperation, and pro-environmental behavior.

However, when it was thematically analyzed which themes are the most frequent ones, two themes emerged as the most prominent, that is lack of awareness and pro-environmental behavior. By lack of awareness, we meant that most respondents showed that they possess no information regarding the phenomenon of climate change and don't perceive it as a risk. By pro-environmental, we meant that respondents greatly supported environmentally friendly practices when they were asked if they would conserve energy resources and buy biodegradable products. Moreover, participants also quoted that they feel nature has a positive impact on their mood and cognition as well as how adverse conditions also influence their daily life decisions alongside their mood.

In my opinion, there is a growing need for the addition of environmental sciences courses or subjects in educational curriculum and media programs so that we won't see such ignorance and lack of awareness for climate change in our youth and combat against its adverse consequences by adopting pro-environmental attitude. Many governmental policies could be shaped in such a way that it supports the sustainable goal of climate action and encourage the citizens to comply to pro-environmental practices by reducing energy consumption and carbon emissions etc.

There are studies that also signify how climate change awareness can bring about positive feelings as well as inculcate pro-environmental behavior in individuals. Pro-environmental behavior refers to the behavior which consciously seeks to minimize the negative impact of one's actions on the natural or built world (Kollmus & Agyeman, 2002), or even benefits the environment (Steg & Vlek, 2009). Engaging in pro-environmental behavior has been associated with not just conservation of the

natural environment but gains to personal wellbeing (e.g., Brown & Kasser, 2005). Empirical evidence also suggests that involvement in environmental activism improves individual's well-being (Sohr, 2001; Eigner, 2001). Another study by Young (1996, 2000) also indicated that environmentally responsible behaviors provide inherent satisfaction and improve personal well-being.

Furthermore, certain limitations were also denoted in this qualitative study, which was, the sample size was relatively small and cannot be generalized to the overall student population of the developing country.

Despite these limitations, this qualitative study has enhanced our understanding regarding the awareness of student population regarding the climate change issue. We're hopeful that the current research will stimulate further investigation to fulfill those knowledge gaps existing within literature.

Conclusion

It has been concluded that there is a lack of awareness regarding information related to climate change amongst the student population of the developing country, as a consequence, they don't perceive climate change as a risk. Moreover, they also favored to perform pro-environmental activities if given the feasibility.

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