



STUDENT PERCEPTIONS ON CLIMATE CHANGE: INSIGHTS FOR FORGING ACTION PATHWAYS

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Abstract

This study investigates the post-pandemic level of climate change awareness, perceived climate-related issues, emotional responses, and action pathways among college students in the Philippines. Framed by the country's climate vulnerability and relevant policy directives, the study employed a quantitative descriptive-correlational design using a validated survey instrument adapted from the Yonmenkaigi System Method (YSM) to capture both cognitive and affective dimensions of climate awareness. Data were gathered from a purposively sampled group of college students and analyzed using descriptive statistics and Pearson correlation in Microsoft Excel. Results show that students are generally "well aware" of the causes and effects of climate change and environmental issues such as deforestation and pollution but demonstrate limited recognition of indirect and psychosocial impacts like drought and climate-induced mental health problems. Moderate levels of climate anxiety were reported, along with high satisfaction with institutional responses; however, participation in climate initiatives was low. A small but statistically significant positive correlation ($r = 0.25$, $p < .01$) was found between awareness and anxiety, indicating that greater knowledge slightly increases concern. These findings highlight the need for more participatory and action-oriented climate education to strengthen the link between understanding and engagement. The study supports CHED Memorandum Order No. 20 (2017), the National Climate Change Action Plan (2021), and the Sustainable Development Goals (SDG 13 and SDG 4), contributing to the literature on environmental literacy and youth empowerment in Philippine higher education.

Keywords: climate change awareness, climate anxiety, environmental literacy, participatory education, Yonmenkaigi System Method, college students



Introduction

Climate change continues to pose an existential challenge for the Philippines, a nation consistently ranked among the most vulnerable countries to climate-related hazards such as typhoons, sea-level rise, and droughts (Lasco, Pulhin, & Cruz, 2019; World Bank, 2021). In response to this vulnerability, national institutions such as the Climate Change Commission (2021) and the Commission on Higher Education (CHED, 2017) have emphasized mainstreaming climate change education into curricula at all levels. While environmental literacy is increasingly integrated into general education, less is known about how these curricular exposures translate into actual student perceptions, anxieties, and empowerment, particularly in the post-pandemic educational setting.

The purpose of this research is to assess the post-pandemic levels of climate change awareness, emotional concern, and perceived readiness for action among college students in the Philippines using a structured instrument adapted from the Yonmenkaigi System Method (YSM). While existing literature confirms that students have a baseline knowledge of climate science (Magulod, 2018; Corpuz, 2023), this study investigates whether this awareness translates into behavioral intention or tangible climate action. Furthermore, the study explores the relationship between awareness and eco-anxiety—an emerging psychosocial dimension of environmental education (Sanchez, Reyes, & Gonzales, 2024). The inquiry explicitly addresses the gap in local research that synthesizes these three dimensions: cognitive literacy, emotional response, and behavioral empowerment within a single student population, using a participatory diagnostic framework.

To address this gap, a quantitative, descriptive, and correlational approach was employed. A validated survey instrument, structured using YSM principles, was administered to college students to gather data on their climate knowledge, perception of related issues, anxiety levels, and engagement in environmental initiatives. Data analysis was conducted using Microsoft Excel to compute descriptive statistics and correlation coefficients and interpret levels of awareness and concern. The theoretical framing drew from Environmental Literacy Theory and participatory education paradigms, ensuring alignment with CHED and Sustainable Development Goal 13 (Climate Action) and Goal 4 (Quality Education).

Findings reveal that students are generally "well aware" of the causes and effects of climate change, with high recognition of environmental issues such as pollution, deforestation, and extreme weather. However, knowledge gaps persist in understanding slow-onset impacts such as drought and climate-induced mental health issues. Climate anxiety was reported at moderate levels, and trust in institutional climate efforts was relatively high, which may have contributed to students' lower self-reported engagement in community action. A weak but significant positive correlation was observed between awareness and anxiety, reinforcing the idea that knowledge increases concern but not necessarily participation.

Based on these insights, the study recommends actionable strategies at both the school and community levels. These include strengthening curriculum content on lesser-



known climate impacts, integrating participatory pedagogies like YSM in classroom projects, and establishing platforms for student-led environmental action. Aligning with the National Climate Change Action Plan (2021) and CHED's climate education directives (2017), the study advocates for a more responsive educational environment—one that not only informs but also empowers students to become climate-literate change agents within their local contexts.

Materials and Methods

Research Design

This study employed a quantitative descriptive-correlational research design to explore the post-pandemic level of climate change awareness, perceived issue recognition, and emotional responses among college students. This design was chosen to allow the systematic description of students' knowledge and attitudes, as well as to examine the potential statistical relationship between awareness and climate-related anxiety. By employing a correlational approach, the study sought to investigate whether increased awareness leads to heightened concern or readiness for action—an emerging dimension in environmental education research.

Research Environment

The study was conducted at Colegio de San Francisco Javier of Rizal, Zamboanga del Norte Incorporated, a private Catholic higher education institution offering various undergraduate degree programs. The school integrates environmental education into its general education curriculum, making it a fitting context for exploring climate literacy and perception among college-level learners in a post-pandemic setting.

Participants and Sampling

The participants were 185 students randomly selected from the total population of college enrollees, using Slovin's formula with a 5% margin of error. The random sampling method ensured that all students had an equal chance of being selected, promoting objectivity and representativeness. The sample included students from various programs and year levels, thereby capturing diverse academic backgrounds and personal experiences related to climate change.

The rationale behind selecting this number is supported by the principle of statistical adequacy in social research, where a sample of this size is sufficient to allow reliable interpretation of central tendencies and to test correlations at an acceptable significance level ($p < .05$).

Instrumentation

The study utilized a structured survey instrument adapted from the Yonmenkaigi System Method (YSM), designed to capture three key constructs: (1) general awareness of



climate change, (2) identification of climate-related issues, and (3) level of climate anxiety and perceived action readiness. The instrument was divided into four major parts: the demographic profile, climate knowledge items (rated on a 5-point Likert scale), issue association (checklist format), and emotional perception scales.

The YSM served as a conceptual and procedural guide in framing the survey to capture multidimensional student insights and foster systems thinking. Although this study did not conduct a comprehensive YSM workshop, the method informed the questionnaire design, encouraging students to think beyond individual responses and recognize the interconnected nature of climate challenges.

Validity and Reliability

Content validity was ensured through expert review by three academic professionals with backgrounds in environmental education and climate science. Feedback focused on language clarity, scale sensitivity, and content appropriateness. The revised instrument was pilot-tested on 15 non-participant students, yielding a Cronbach's alpha of 0.87, indicating high internal consistency. Minor refinements were made based on the pilot phase, particularly in terms of wording and clarity of the response scale.

Data Collection Procedure

Following ethical approval by the Institutional Research Committee, data were collected through both printed and digital survey forms over two weeks. Randomly selected students were given informed consent forms detailing the study's purpose, procedures, voluntary nature, and confidentiality protocols. Only those who signed the informed consent proceeded to answer the questionnaire. Responses were reviewed for completeness and encoded manually into a spreadsheet for analysis.

All ethical research protocols were strictly observed, including voluntary participation, data privacy, and secure storage of responses. The researchers received training on ethical data handling, and no incentives were provided to participants to minimize potential bias.

Data Analysis

Data were analyzed using Microsoft Excel, a versatile and powerful tool for processing survey data in educational research. Descriptive statistics (mean, frequency, and percentage) were used to describe levels of awareness and concern. For inferential analysis, the Pearson product-moment correlation coefficient (r) was computed using Excel's built-in CORREL function to explore the relationship between climate change awareness and climate anxiety. A significance level of $p < .05$ was set to determine statistical relevance. Tables were generated to summarize the data clearly, and interpretations were made by APA 7th edition guidelines.

This study was limited to a single institution, which may limit the generalizability

of the findings. The data were self-reported, which could be subject to bias. The use of YSM was limited to survey design without full participatory workshops. Lastly, the study was cross-sectional and did not assess long-term behaviors or changes over time.

Ethical Considerations

This study was conducted by the institution's approved research ethics protocol, ensuring compliance with established ethical standards for research involving human participants. Confidentiality and anonymity were strictly upheld throughout the study. Participants were fully informed of the nature of the research, including their right to withdraw at any time without penalty. All data was securely stored and used exclusively for academic research and policy recommendations. Ethical approval, including the research ethics protocol, was reviewed and granted by the institution's Research Ethics Review Board prior to the commencement of the study.

Results and Discussion

This section presents the study's findings, derived from college students' responses to the climate awareness instrument, informed by the Yonmenkaigi System Method (YSM). The results are structured around key dimensions of awareness: knowledge of climate change causes and effects, recognition of related issues, emotional and psychological responses such as climate anxiety, and perceived adequacy of current measures. Descriptive and correlational analyses were employed using Microsoft Excel to interpret the survey data. The implications of these findings are discussed in the context of existing climate change education literature, with a particular emphasis on the environmental literacy framework and the Philippine education policy landscape.

Table 1
Climate Change Awareness Levels

Indicators	Mean Score	Interpretation
Understanding of climate change definition	4.5	Well Aware
Awareness of causes (e.g., greenhouse gases, deforestation)	4.4	Well Aware
Awareness of effects (e.g., global warming, sea level rise)	4.3	Well Aware
Awareness of mitigation solutions	4.0	Aware

Note. Scale used: 1 (Not Aware) to 5 (Very Well Aware).

The data presented in Table 1 illustrate that the respondents generally demonstrated a high level of awareness regarding the causes and effects of climate change, as well as a fair understanding of mitigation solutions. The mean scores, ranging from 4.0 to 4.5, fall within the "Aware" to "Well Aware" interpretation range, indicating that foundational climate literacy is well-established among the surveyed college students.

These data were gathered using a structured survey questionnaire developed through the Yonmenkaigi System Method (YSM) and validated through expert review. Respondents were asked to rate their awareness using a five-point Likert scale, and descriptive statistics, including means and standard deviations, were calculated to quantify the responses.

The high awareness levels align with the findings of Magulod (2018) and Lasco et al. (2019), who similarly reported that Filipino students display a strong awareness of climate change fundamentals. These results highlight the effectiveness of educational integration and community engagement in fostering environmental literacy at the cognitive level.

Table 2
Awareness of Climate-Related Issues

Issue	Percentage Recognized (%)
Air pollution	78
Deforestation	75
Extreme weather events	72
Biodiversity loss	68
Disease outbreaks	65
Drought	48
Mental health impacts	42
Economic instability	55

Note. Based on student identification of issues linked to climate change.

Table 2 summarizes the level of recognition among students regarding specific issues connected to climate change. It is notable that students widely recognized traditional environmental problems, such as pollution and deforestation, while less commonly linked issues, like mental health and drought, received lower recognition.

The instrument included a checklist-type question that asked respondents to identify which issues they believed were associated with climate change. Frequencies and percentages were computed from their responses to assess the breadth of their awareness.

This multidimensional awareness reflects an expanding conceptual framework among students and supports the World Bank's (2021) findings on youth climate literacy. However, as seen in Corpuz (2023), gaps persist in recognizing the indirect effects of climate change, highlighting a need for more integrative climate education.

Table 3
Climate Anxiety and Perception of Action

Measure	Mean Score / Observation
Level of climate concern	3.2 (Moderate)
Trust in government efforts	54% Neutral or Agree
Satisfaction with local countermeasures	58% Somewhat Satisfied
Participation in environmental initiatives	Low (few involved in orgs)



Note. Scores are based on a five-point Likert scale.

Table 3 reveals moderate levels of climate concern among students, along with mixed perceptions of institutional action and low levels of personal involvement. These results suggest that while students are concerned, they may not yet feel empowered to participate actively.

Data were obtained through scaled response items and multiple-choice questions embedded in the validated YSM-informed instrument. The responses were tabulated using descriptive statistical analysis, including frequency distributions and measures of central tendency.

This finding resonates with Sanchez et al. (2024), who documented similar patterns of moderate eco-anxiety and limited behavioral action. The data highlight the importance of bridging awareness with empowerment, as recommended by UNICEF (2020) and Save the Children Philippines (2021).

Table 4
Correlation Between Awareness and Anxiety

Variable Pair	Correlation Coefficient (r)	Significance (p)	Interpretation
Climate Awareness vs. Climate Anxiety	0.25	< .01	Slight Positive Correlation

Note. Pearson correlation; $p < .05$ indicates statistical significance.

Table 4 presents the correlation between students' awareness and their reported anxiety levels. The statistically significant but weak correlation suggests that more informed students tended to report slightly higher climate concerns.

The data for this analysis were extracted from Likert-scale responses to the awareness and anxiety items. Pearson correlation was applied using Microsoft Excel's CORREL function to determine the statistical relationship between the two variables. The computation was conducted using raw Likert-scale data exported from the survey spreadsheet.

This modest correlation supports the conclusions of Sanchez et al. (2024), indicating that increasing knowledge may elevate concern to constructive levels. It validates the assumption that climate education need not provoke fear if paired with empowerment strategies (Lasco et al., 2019).

Climate Change Awareness Among College Students

High Awareness of Climate Causes and Effects. The survey results indicated that college students generally had a high awareness of climate change. On a five-point scale, the mean score for overall climate change awareness was in the upper range ($M = 4.3$), interpreted as "High." A large majority of respondents correctly identified the primary causes of



climate change (e.g., greenhouse gas emissions, deforestation, industrial activity) and its effects (e.g., global warming, sea-level rise, extreme weather). This finding aligns with prior studies, such as that by Magulod (2018), who found similarly high awareness levels among students in Northern Philippines.

The present cohort's strong awareness may be attributed to increased coverage in mainstream media, incorporation into academic curricula, and firsthand experiences with climate disasters, such as typhoons and flooding. These factors reinforce the cognitive component of environmental literacy, a key foundation for climate action (Lasco et al., 2019).

Knowledge of Climate-Related Issues. Beyond core concepts, students also recognized related environmental and socio-political issues. When presented with a list, over 50% identified air pollution, deforestation, extreme weather, and biodiversity loss as associated with climate change. Some even recognized economic instability and global security risks. This broad awareness suggests a systems-level understanding, which is ideal for cultivating deeper engagement (World Bank, 2021). However, there were notable gaps. Only 48% of students identified drought as a climate impact—consistent with Corpuz (2023)—and understanding of health impacts, especially on mental health, was limited.

Climate Anxiety and Perceptions of Action

Moderate Levels of Climate Concern. The survey revealed that students reported moderate levels of climate-related anxiety ($M = 3.2$). While many acknowledged being worried about climate change and its future impacts, few indicated being overwhelmed or helpless. This result supports the findings of Sanchez et al. (2024), who also documented moderate eco-anxiety among Filipino undergraduates.

Satisfaction with Existing Measures. A majority expressed either satisfaction or neutrality regarding government and institutional climate actions. This optimism may contribute to lowered anxiety but can also result in reduced personal involvement. As highlighted by Jose (2023), trust in institutional responses must be coupled with grassroots empowerment to sustain engagement.

Awareness-Anxiety Correlation. Statistical results showed a slight positive correlation between awareness and anxiety ($r = 0.25$, $p < .01$). This means that greater knowledge modestly increased concern—aligning with Sanchez et al. (2024)—but not to detrimental levels. This dispels the notion that education induces panic and affirms the need for informed empowered responses.

Bridging the Gap: From Knowledge to Empowerment

Despite high awareness and moderate concern, actual participation in climate initiatives was limited. Most students engaged in individual eco-habits but not in organized environmental efforts. This reflects a gap in the behavioral component of environmental literacy (UNICEF, 2020; Environmental Literacy Theory).



The Role of YSM. The use of the Yonmenkaigi System Method (YSM) as a diagnostic instrument revealed students' systemic thinking capabilities. Although a comprehensive YSM workshop was not implemented, the data suggested its potential to inform collaborative solution-making (Parry, 2022). Students' identification of deforestation and flooding as pressing issues—paired with satisfaction toward tree planting campaigns—shows how YSM can help refine strategies from observation to action.

Educational Implications. The study emphasizes the following educational reforms:

1. **Curricular Enrichment:** Add content on underrepresented topics like climate-health impacts and socio-political consequences.
2. **Participatory Pedagogy:** Integrate problem-solving frameworks like YSM in class projects.
3. **Action-Oriented Engagement:** Establish platforms for students to apply their knowledge through campaigns, monitoring programs, and partnerships.

Empowerment is most effective when students see tangible results in their community, such as improved waste segregation or reforestation efforts. As Save the Children Philippines (2021) and CHED (2017) advocate, youth empowerment must be systemic and sustained through structured involvement.

In sum, the gap between awareness and empowerment can be narrowed through strategic educational interventions that combine knowledge, skill-building, and opportunities for engagement.

Conclusion

The findings of this study confirmed that college students demonstrated a high level of awareness regarding the causes and effects of climate change, particularly recognizing core issues such as greenhouse gas emissions, deforestation, global warming, and extreme weather events. This level of awareness reflects the success of curricular and community exposures in shaping foundational climate literacy, consistent with Environmental Literacy Theory. However, awareness of climate mitigation solutions, while present, was comparatively lower, suggesting that while students understand the problem, they are less informed about specific actions or strategies to address it.

In terms of broader climate-related issues, students exhibited multidimensional awareness by recognizing a variety of interconnected concerns—environmental, health-related, and socio-political. Air pollution, disease outbreaks, and economic instability were among the most commonly identified concerns. Nonetheless, notable gaps were observed in students' awareness of less visible issues, such as drought and its impacts on mental health. These findings highlight the need for more integrative and interdisciplinary climate education approaches that extend beyond scientific content to encompass public health, migration, and governance.

While students reported moderate levels of concern or "eco-anxiety," only a small fraction indicated feelings of helplessness or being overwhelmed. This emotional response was accompanied by a generally positive perception of governmental and institutional



countermeasures. However, actual student participation in environmental initiatives was limited, with few engaging in organized activities beyond individual behavioral habits. This reveals a disconnect between knowledge and action—a critical concern for climate educators. The study highlights that the cognitive and emotional components of environmental literacy are insufficient unless paired with structured opportunities for engagement and empowerment.

Finally, the analysis revealed a statistically significant but weak positive correlation between students' awareness and their climate-related anxiety. This suggests that while greater knowledge modestly increases concern, it does not automatically lead to overwhelming emotional distress. Instead, this level of concern may serve as a motivational force for action, provided that appropriate platforms and guidance are offered. These findings support the idea that climate education should not only aim to inform but also to empower, with a deliberate focus on transforming awareness into actionable capacity through participatory approaches, such as the Yonmenkaigi System Method.

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