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Research Article

LEARNERS' CLIMATE CHANGE KNOWLEDGE AND CLIMATE CHANGE ADAPTATION PRACTICES IN SCHOOL

Loreno P. Norcio*

Cuenca National High School
**Corresponding Author: loreno.norcio@gmail.com*

Abstract

Climate change remains a pressing global challenge. In response, school curricula have increasingly integrated related concepts and lessons to promote awareness, understanding, and responsible action among learners. This study examined the relationship between learners' climate change knowledge and their adaptation practices in a secondary school context. Using a quantitative correlational design, data were collected from 184 learners of Cuenca National High School through a validated and reliable researcher-developed questionnaire. The instrument measured three dimensions of climate change knowledge—nature, causes, and effects—and the extent of adaptation practices in school. Descriptive statistics (mean and standard deviation) and inferential analysis (Pearson product-moment correlation) were employed. Findings revealed that learners demonstrated a very high level of knowledge regarding the nature and causes of climate change, and a high level of knowledge of its effects. In terms of adaptation, learners exhibited a great extent of climate-responsive practices, particularly in recycling, waste segregation, and resource conservation. However, participation in activities such as environmental campaigns and reforestation was comparatively lower. Correlation analysis showed statistically significant moderate positive relationships between knowledge and adaptation practices across all dimensions. Despite these significant associations, results indicate a persistent knowledge–action gap, suggesting that knowledge alone explains only a portion of adaptive behavior. The study highlighted the need for more action-oriented and experiential climate education. It recommends strengthening school-based programs that provide meaningful opportunities for learners to translate knowledge into sustained environmental action.

Keywords: Climate Change, Climate Change Knowledge, Climate Change Adaptation, Environmental Education

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INTRODUCTION

Climate change is widely recognized as one of the most urgent global challenges of the present time. Over recent decades, its impacts have become increasingly visible, intense, and destructive. The National Aeronautics and Space Administration (NASA, 2024) defines climate change as a long-term alteration in the Earth's average weather patterns. According to The Sustainable Development Goals Report 2022, rising global temperatures have led to more frequent and severe extreme weather events, including heatwaves, heavy rainfall, droughts, and stronger cyclones (United Nations Department of Economic and Social Affairs, 2022). These developments underscore the accelerating pace and far-reaching consequences of climate change worldwide.

The vulnerability of regions to climate change is uneven, with Southeast Asia identified as one of the most affected areas globally. The Global Climate Risk Index (Eckstein et al., 2019) reported that from 1998 to 2017, Southeast Asia experienced significant fatalities and economic losses due to climate-related hazards. Countries in the region frequently face extreme events such as floods, landslides, cyclones, and prolonged rainfall, resulting in loss of life, infrastructure damage, displacement of communities, and economic strain. These recurring challenges highlight the urgent need to strengthen climate change adaptation, disaster risk reduction, and sustainable development efforts.

Climate change adaptation refers to strategies and actions designed to cope with current and projected climate impacts. It involves making adjustments that reduce vulnerability and enhance resilience while also taking advantage of potential opportunities arising from environmental changes. Examples include improving agricultural practices, establishing early warning systems, promoting sustainable resource management, and developing climate-resilient infrastructure. These efforts align with Goal 13 of the United Nations Sustainable Development Goals, which emphasizes collective action to combat climate change and its impacts (UN, n.d.).

Education plays a critical role in advancing climate change adaptation. It equips individuals with the knowledge, skills, values, and behaviors necessary to understand climate risks and respond effectively. According to the United Nations (2020), education enables learners to develop informed perspectives, adopt sustainable practices, and participate in community-based solutions. Supporting this view, Handayani and Triyanto (2020) emphasized that education helps individuals anticipate, respond to, and learn from climate impacts by fostering adaptive skills that extend beyond scientific knowledge.

By integrating climate change education across disciplines, promoting inquiry-based and community-oriented learning, and modeling sustainable practices, schools can help develop a generation capable of addressing climate challenges with competence, empathy, and innovation. Thus, educational institutions serve not only as centers of instruction but also as vital agents of climate resilience and sustainable development.

Educators play a pivotal role in this process. Beyond delivering scientific content, they guide learners in examining the social, ethical, economic, and political dimensions of climate change. Zeidler et al. (2019) highlighted the importance of engaging students in socio-scientific issues through evidence-based reasoning, consideration of multiple perspectives, and active participation in decision-making. Through well-designed discussions, problem-solving activities, and real-world applications, teachers foster critical thinking, informed judgment, and civic responsibility among learners.

In the Philippine context, the education sector has taken proactive steps to integrate climate change education across learning areas. Recognizing the role of schools in building climate awareness and resilience, the Department of Education (DepEd) has implemented various initiatives to support both teachers and students. In 2021, through its Disaster Risk Reduction and Management Service, DepEd released a comprehensive set of learning resources aimed at making climate education more accessible and engaging. Furthermore, in 2022, DepEd reinforced the implementation of Republic Act No. 9729, which mandates the integration of climate change education into the K–12 curriculum. This policy ensures that learners develop not only scientific understanding but also critical thinking,

problem-solving skills, and a sense of responsibility toward climate action.

Despite these efforts, several studies have revealed persistent challenges. A policy brief from Philippine Normal University (Espinosa et al., 2024) found that students' knowledge of climate change remains low despite its curricular integration. This gap has been attributed to limited scope and inconsistent implementation, as climate-related activities are often conducted only once or twice a year and are sometimes relegated to extracurricular programs. Similarly, earlier studies reported gaps in learners' understanding, including limited scientific knowledge (Adora & Adora, 2018) and only moderate awareness of climate change concepts (Uri & Regio, 2023; Almario et al., 2024), although awareness of its causes appears relatively high (Samonte, 2024). Furthermore, learners have demonstrated only moderate awareness of climate change education programs implemented in schools (Uri & Regio, 2023).

These findings point to several critical research gaps. First, a policy–practice gap exists, wherein national mandates and available resources may not be fully implemented or maximized in classroom settings. Second, there is a gap between knowledge and action; while education is expected to promote behavioral change, limited evidence exists on whether students apply climate-related knowledge in real-life contexts. Lastly, no prior study has been conducted at Cuenca National High School to evaluate the implementation of climate change education policies at the local level.

In light of these gaps, this study is undertaken to assess the implementation of climate change education and its relations to learners' adaptive practices.

This study generally aims to determine the relationship between learners' knowledge of climate change and their climate adaptation. Specifically, this study seeks to answer the following questions:

1. What is the learner's level of awareness on climate change knowledge in terms of its:
    1.1. nature;
    1.2. causes; and
    1.3. effects?
2. What is the learner's extent of climate change adaptation in school?
3. Is there a significant relationship between learners' level of climate change knowledge and extent of climate change adaptation in school?
4. What output can be derived from the results of the study?

METHODS

Research Design

The study utilized a quantitative research design. Specifically, it used a correlational research design. This design was deemed the most appropriate in this study, as it provides more valid and reliable data for determining relationships among two or more variables (Grand Canyon University, 2021). Furthermore, this research design helps determine the linear relationship between climate change knowledge and climate change adaptation practices in schools.

Research Locale and Respondents

The study was conducted at Cuenca National High School (Figure 1) as it is suitable for the study because it is a typical public school where students are exposed to climate-related issues and environmental education. This allows for assessing both their knowledge of climate change and their actual adaptation practices in a real school setting.

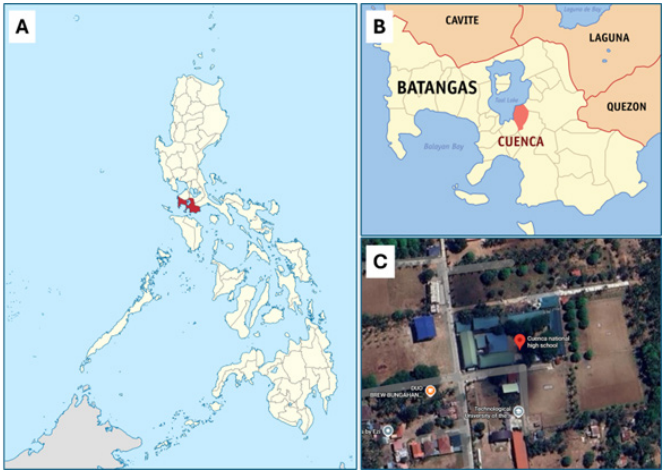

Figure 1. (A) Location of Batangas Province within the Philippines, (B) Location of Cuenca within Batangas Province, (C) Cuenca NHS Location Map

The study involved 184 learners who were selected using convenience sampling because they were available during the administration of the questionnaire and had their parents' and/or guardians' permission to participate in this study.

Research Instrument

The study utilized a researcher-developed questionnaire as the primary instrument for data collection. The instrument was carefully designed based on a review of the relevant literature and aligned with the study's objectives to ensure content relevance and clarity. The questionnaire consisted of two main parts. Part I assessed learners' level of climate change awareness, covering key concepts such as the nature of climate change, its causes, and its effects. This section aimed to determine the level of students' knowledge and understanding of climate change issues. Part II measured the extent of climate change adaptation practices in the school as perceived by the learners. This section included items related to climate change adaptation practices in schools. A Likert-scale format was used in both sections to quantify responses, enabling statistical analysis and data interpretation.

Construction. In constructing the questionnaire, various scholarly articles, books, and related literature were reviewed to ensure comprehensive coverage of the concepts under investigation. The insights gathered from these sources were incorporated into the instrument to ensure alignment with the study's objectives and enhance its contextual relevance to the target respondents.

Validation. The questionnaire was face-validated by three experts in Disaster Risk Reduction and Management (DRRM) and climate change education to ensure clarity, relevance, and alignment with the study's objectives. Their comments and recommendations were incorporated prior to pilot testing. To further establish content validity, the Content Validity Index (CVI) was computed. Results showed that the I-CVI values ranged from 0.83 to 1.00, indicating high agreement among experts. The Scale-Level Content Validity Index (S-CVI/Ave) was computed at 0.91, which exceeds the acceptable threshold of 0.80, signifying excellent content validity of the instrument. For reliability testing, the questionnaire was pilot tested among 30 learners who were not included in the study's actual respondents. Internal consistency was measured using Cronbach's Alpha. The results revealed the following reliability coefficients. (A) Climate Change Awareness Scale with α = 0.89; (B) Climate Change Adaptation Scale with α = 0.91; (C) Overall Instrument Reliability with α = 0.90. These values indicate high internal consistency, as Cronbach's alpha values above 0.70 are generally considered acceptable. Therefore, the instrument was deemed reliable for data collection.

Administration. The questionnaires were administered online via Google Forms to facilitate efficient, organized data collection. Prior to conducting the study, formal permission was obtained from the School Head to secure institutional approval. In addition, informed consent was obtained from the parents or guardians of the participating learners, clearly explaining the purpose of the study, procedures involved, and the voluntary nature of participation. The survey link was distributed to the respondents only after all necessary approvals were granted. Participants were given sufficient time to complete the questionnaire at their convenience. In accordance with ethical research standards and data privacy regulations, respondents were assured that their responses would be kept strictly confidential. No personally identifiable information was collected, and all responses were used solely for academic purposes. The data gathered were securely stored and accessible only to the researcher. Furthermore, participants were informed that their involvement in the study was entirely voluntary. They were given the right to decline to participate or withdraw from the study at any time without penalty or negative consequences.

Scoring of Responses. Responses are scored using the scale continuum that follows, and corresponding verbal interpretations were used.

Table 1. Interpretation of Results

Option	Scale Range	Verbal Interpretation
4	3.26 – 4.00	Great Extent/ Very High Level
3	2.51 – 3.25	Moderate Extent/ High Level
2	1.76 – 2.50	Slight Extent/ Low Level
1	1.00 – 1.75	Least Extent/ Very Low Level

Data Gathering Procedure

The confidentiality of respondents and their responses was given utmost priority throughout the study. Initially, the School Head was informed about the research, and formal permission was secured before any data collection commenced. Following this, parents were notified about the study via messages sent to their designated Facebook Messenger group chats, providing clear information about the study's purpose and procedures. They were given the opportunity to voluntarily consent or decline participation, ensuring that participation was fully informed and optional.

All data collected from respondents were handled in strict compliance with the Data Privacy Act of 2012, guaranteeing the protection of personal information, maintaining confidentiality, and ensuring that responses were used solely for the purposes of this study. These measures ensured ethical standards were upheld, fostering trust among participants and safeguarding their rights throughout the research process.

Data Analysis

The data collected in this study were systematically sorted, tabulated, and summarized using tables to ensure clarity and ease of analysis. To interpret the data, the following statistical treatments were applied.

Mean. Used to determine the average response for each criterion under climate change knowledge and climate change adaptation.

Standard Deviation. This statistical measure was employed to assess the dispersion or variability of responses around the mean. By using verbal interpretations alongside standard deviation, the study was able to categorize responses into meaningful levels, indicating the extent to which respondents' opinions or behaviors aligned.

Pearson Product-Moment Correlation. This inferential test was applied to examine the linear relationship between learners' climate change knowledge and their adaptation practices. It enabled the study to determine whether variations in knowledge were significantly associated with differences in how learners implement adaptation strategies.

Together, these statistical methods provided a robust framework for analyzing both descriptive and relational aspects of the data, ensuring accurate and meaningful findings.

Ethical Considerations

The confidentiality of respondents and their responses was primarily ensured by informing the School Head of the study's conduct. Upon granting permission, parents were informed about the study through a message sent on their specific Facebook Messenger group chats. They are given the chance to agree and disagree to participate in the study. All responses were handled in accordance with the Data Privacy Act of 2012.

RESULTS AND DISCUSSION

Level of Climate Change Knowledge

Climate change knowledge refers to the measurable level of learners' understanding of climate change, as determined by their responses on its causes, effects and nature. Table 2 presents the learners' responses regarding the nature of climate change.

Table 2. Nature of Climate Change

I know that…	Mean	*SD*	Verbal Interpretation
1. signs of climate change differ from one place to another	3.33	0.74	Very high level
2. climate change is certain due to modernity of life	3.24	0.79	High level
3. climate change is the natural change in temperatures of the Earth	3.45	0.70	Very high level
4. human can control climate change	3.03	1.02	High level
5. climate change is associated with the increase in the greenhouse gases in the atmosphere	3.33	0.81	Very high level
COMPOSITE MEAN	**3.28**	**0.60**	**Very high level**

As shown in Table 2, learners demonstrate a very high level of knowledge regarding the nature of climate change. In particular, they show strong understanding of climate change as variations in the Earth's temperature (*M* = 3.45, *SD* = 0.70). This finding is supported by empirical studies indicating that students can develop substantial knowledge of climate change concepts through education. For instance, a study by Gazzaz and Aldeseet (2021) found that students exhibited high levels of knowledge regarding the nature, causes, and effects of climate change, particularly in relation to its impacts. Similarly, research on secondary students' conceptions of climate change showed that learners are generally aware of the causes and effects of global warming, particularly linking human activities such as pollution and deforestation to climate change (Esakkimuthu & Banupriya, 2023).

However, learners in this study perceived that humans are unable to control climate change, as reflected in the lowest mean (*M* = 3.03) and highest standard deviation (*SD* = 1.02), indicating varied beliefs. This aligns with recent findings that knowledge does not always translate into a strong sense of agency or action. A study on climate change education outcomes revealed that while students may gain knowledge, the impact on their attitudes and willingness to act can be limited (Tolppanen et al., 2022). Likewise, Cornejo et al. (2024) found only a low correlation between knowledge and perception, suggesting that even informed students may still hold uncertain or conflicting views about climate change responsibility and control.

The results of the present study contradict the earlier findings of Adora and Adora (2018), which reported that learners lacked basic knowledge of climate change. Instead, the current findings suggest a positive shift in learners' knowledge levels over time. This improvement may be attributed to the increasing integration of climate change education in formal schooling. However, consistent with previous research, gaps remain between knowledge and action, indicating the need for instructional approaches that emphasize not only conceptual understanding but also human agency and practical engagement in climate solutions.

Table 3 shows learners' responses on the causes of climate change.

Table 3. Causes of Climate Change

I know that…	Mean	*SD*	Verbal Interpretation
1. environmental pollution from industries is the main cause of climate change	3.46	0.68	Very high level
2. burning of fossil fuels contributes to climate change	3.40	0.76	Very high level
3. deforestation is one of the causes of climate change	3.46	0.77	Very high level
4. transportation sector contributes substantially to climate change	3.32	0.76	Very high level
5. agricultural activities such as animal and plant production contribute to climate change	3.25	0.79	High level
COMPOSITE MEAN	**3.28**	**0.60**	**Very high level**

Learners demonstrated a very high level of knowledge regarding the causes of climate change, as presented in Table 3. They identified industrial activities and deforestation as the primary contributors to climate change, reflecting a strong awareness of human-induced factors. The overall statistical result (M = 3.38, SD = 0.59) indicate a high degree of consensus. This suggests that most students share a similar understanding of the causes of climate change, highlighting the effectiveness of prior education and exposure to environmental issues in shaping their knowledge.

This finding aligns with Samonte (2024), who argued that contemporary learners possess an elevated awareness of both human and natural climate drivers. Furthermore, this high level of literacy reflects global trends identified by Ardoin et al. (2020), whose synthesis of environmental education research suggests that integrated science curricula have successfully moved students beyond "general concern" toward a specific understanding of systemic causes like industrial emissions.

The emphasis on deforestation as a primary cause also supports the findings of Baldwin et al. (2022), who noted that adolescents often prioritize visible land-use changes as a key indicator of climate disruption. Consequently, the results indicate that the current educational environment is effective in establishing a baseline of scientific literacy necessary for informed environmental citizenship.

Table 4 presents learners' responses on the effects of climate change.

Table 4. Effects of Climate Change

I know that…	Mean	*SD*	Verbal Interpretation
1. climate change causes biodiversity loss	3.28	0.80	Very high level
2. human lives with the effects of climate change	3.27	0.82	Very high level
3. rise in water level in seas is a result of climate change	3.24	0.81	High level
4. decline in plant and animal food production is caused by climate change	3.16	0.85	High level
5. climate change contributes to increased wind and water erosion of soil	3.30	0.80	Very high level
COMPOSITE MEAN	**3.25**	**0.68**	**High level**

Table 4 indicates that learners possess a high level of knowledge regarding the multifaceted effects of climate change. A primary area of consensus was the recognition of how human lives are directly impacted by environmental shifts. The statistical proximity of the mean (M = 3.25) and standard deviation (SD = 0.68) suggests a uniform and high level of comprehension across the participant group.

These findings align with Hickman et al. (2021), whose large-scale study across ten countries found that young people are acutely aware of how climate change threatens human life and future security. Similarly, Desabayla and Gueta (2023) found that senior high school students in the Philippines demonstrated a high level of agreement regarding the adverse effects of climate change, with many correctly identifying it as a serious threat to human health and local ecosystems.

However, it contradicts the study of Almario et al. (2024), which found that learners have limited comprehension of the effects of climate change on the country. Consequently, while Almario's work highlights a potential gap in understanding specific technical or economic details, the current data confirms a robust and shared awareness of the broad, life-altering consequences of the climate crisis among this specific group of learners.

Overall, learners have a very high level of knowledge on the nature (*M* = 3.28, *SD* = 0.60) and causes (*M* = 3.38, *SD* = 0.59) of climate change, but a high level of knowledge on its effects (*M* = 3.25, *SD* = 0.68). This provides a good point of view that learners are well-informed and educated about climate change and are aware of its effects.

Extent of Climate Change Adaptation

Climate change adaptation refers to actions that help reduce vulnerability to the current or expected impacts of climate change (United Nations Development Programme, n.d.). Table 5 presents learners' climate change adaptation practices in school.

Table 5. Learners' Climate Change Adaptation Practices in School

In school, I…	Mean	SD	Verbal Interpretation
1. practice recycling	3.61	0.65	Great extent
2. practice waste segregation	3.56	0.67	Great extent
3. buy and eat organic foods	3.25	0.78	Moderate extent
4. take part in campaigns about environmental issues	3.26	0.80	Great extent
5. walk or use public transport in going to school	3.44	0.77	Great extent
6. conserve water and electricity	3.58	0.65	Great extent
7. share reliable information about climate change adaptation	3.34	0.74	Great extent
8. join in reforestation activities	3.24	0.79	Moderate extent
9. participate in coastal clean up	3.34	0.76	Great extent
10. use reusable items (i.e. tumblers, boxes, etc.)	3.58	0.73	Great extent
COMPOSITE MEAN	**3.42**	**0.73**	**Great extent**

Table 5 illustrates the climate change adaptation practices of learners within the school setting. The data reveals that, generally, learners have a high level of CCA practices (*M* = 3.42, *SD* = 0.73) with recycling (*M* = 3.61, *SD* = 0.65), conservation of water and electricity (*M* = 3.58, *SD* = 0.65) and the use of reusable items (*M* = 3.58, *SD* = 0.73) emerging as the most frequent behaviors. These results suggest that learners are highly proficient in "low-cost, high-visibility" conservation efforts, which are often the cornerstone of school-based environmental initiatives.

The third practice is on waste segregation (*M* = 3.56, *SD* = 0.67) that is directly linked to the learners' participation in the Youth for Environment in Schools Organization (YES-O) activities. This finding is supported by Saldana and Domanog (2024) in which participation in YES-O programs had a high impact on students' science learning progress, particularly in terms of their pro-environmental behavior and science performance. Similarly, a study by Ruta and Suan-Timosa (2026) on YES-O coordinators in the Philippines emphasized that co-curricular activities provide the necessary hands-on experiences that institutionalize habits like recycling and segregation.

Conversely, the study identified a significant drop in participation for more intensive activities, such as environmental campaigns (*M* = 3.26, *SD* = 0.80), organic food consumption (*M* = 3.25, *SD* = 0.78), and reforestation (*M* = 3.24, *SD* = 0.79). These activities are least practiced by the learners, as there might be fewer or no opportunities for them to join in such activities. In addition, these activities may not have been integrated into their curriculum or day-to-day activities. This result aligns with Espinosa et al.'s (2024) policy brief, which observed that school activities are limited to climate change adaptation.

Overall, learners have a great extent of climate change adaptation practices in school. However, there are still areas for improvement, such as buying and eating organic foods and participating in reforestation activities.

Relationship between the level of climate change knowledge and extent of climate change adaptation

This study investigated the relationship between learners' level of climate change knowledge and their extent of climate change adaptation. Table 6 shows this relationship.

Table 6. Relationship between Climate Change Knowledge and Adaptation Practices

Knowledge in terms of	Pearson's *r*	*p*	Effect size (Fisher's *z*)	*SE* Effect size
Nature	0.44	< .01	0.47	0.07
Causes	0.39	< .01	0.41	0.07
Effects	0.43	< .01	0.46	0.07

As shown in Tables 6, all three dimensions of climate change knowledge maintain a statistically significant positive relationship with the adaptation practices of the learners ($p < .01$). Knowledge of the Nature of Climate Change demonstrated the strongest correlation ($r = 0.44$, $z = 0.47$, $SE = 0.07$), followed closely by knowledge of its Effects ($r = 0.43$, $z = 0.46$, $SE = 0.07$), while knowledge of the Causes showed the weakest, though still significant, relationship ($r = 0.39$, $z = 0.41$, $SE = 0.07$). Across all three variables, the low Standard Error of 0.07 indicates that these findings are highly precise and consistent within the study group. By examining the coefficients of determination (r^2), it is evident that knowledge of the nature and effects of climate change explains a higher percentage of the variance in behavior (approximately 19.4% and 18.5%, respectively) compared to knowledge of the causes (15.2%). However, the explained variance remains limited (15.2%–19.4%), highlighting a persistent knowledge-action gap. This suggests that while knowledge is a significant predictor, most of the variation in adaptation practices is influenced by other factors such as socioeconomic conditions, access to resources, and environmental or social constraints.

The findings suggest a psychological hierarchy in how climate change information translates into action. The stronger correlations found in the Nature and Effects categories imply that when learners understand the immediate reality and the tangible consequences of the crisis, they feel a greater sense of urgency to adapt. In contrast, the slightly lower correlation for Causes suggests that, while scientific understanding is important, understanding the "why" behind the crisis (such as greenhouse gas emissions) may feel more abstract or distant from a learner's daily ability to intervene. This aligns with environmental psychology theories suggesting that "risk perception", the awareness of what is happening and the potential damage it causes, is a more potent motivator for adaptation than purely mechanistic or historical knowledge.

Consistent with studies by van Valkengoed et al. (2022), Chan et al. (2025), Wang et al. (2022), and Tang (2025), these findings confirm that climate change knowledge supports adaptive behavior. According to van Valkengoed et al. (2022), learners' perceptions of climate change directly influence adaptation actions. Hence, to cultivate the climate change adaptation practices, strengthening learners' knowledge of its nature is a good start. Moreover, Chan et al. (2025) found that knowledge of climate change and its causes is significantly and positively correlated with the intention to engage in pro-environmental behavior. Hence, providing more information on its causes is expected to lead to a more positive and organized adaptation practice. Furthermore, Wang et al. (2022) and Tang (2025) found that learners' knowledge is correlated with their adaptive behaviors. Hence, providing learners with the contextual effects of climate change in their lives results in a greater amount of adaptation practices.

Nevertheless, they also emphasize that knowledge alone is insufficient. Effective interventions should therefore combine education with practical support and enabling conditions to translate awareness into sustained adaptation practices.

Output of the Study

Based on the study's results, the output is an action plan presented below. In line with the SDRRM-CNHS's activities, this project aims to train and establish climate heroes.

Table 7. Project Climate Change HERO (Heroes and Heroines for Environmental Resuscitation and Organization)

KRA	Target	Procedure	Persons Involved
Inclusion of the project in the SDRRM Action Plan	Include project in the SDRRM Work Plan	1. Inclusion in SDRRM Work Plan 2. Orientation on the objectives and background of the project	School heads, faculty members, Parents, Learners
Nature of Climate Change	Determine the nature of climate change	1. Conduct campaign and information dissemination on the nature of climate change	School heads, faculty members, Parents, Learners
Causes of Climate Change	Identify the common causes of climate change	1. Conduct campaign and information dissemination on the causes of climate change 2. Conduct activities in classroom, school, and community about the nature of climate change	School heads, faculty members, Parents, Learners
Effects of Climate Change	List down the effects of climate change in various areas of education	1. Conduct campaign and information dissemination on the effects of climate change 2. Conduct activities in classroom, school, and community about the effects of climate change	School heads, faculty members, Parents, Learners
Climate Change Adaptation Practices	Conduct climate change adaptation activities	1. Conduct campaign and information dissemination on climate change adaptation practices 2. Conduct activities in classroom, school, and community about climate change adaptation practices	School heads, faculty members, Parents, Learners
	Evaluation of the Project	1. Conduct review and evaluation of the project	SDRRM Coordinator

CONCLUSION

This study found that although learners demonstrate very high climate change knowledge, this does not automatically translate into strong adaptation practices, confirming a persistent knowledge–action gap. While knowledge significantly supports behavior, it is not the sole determinant, as adaptation is also shaped by contextual, structural, and motivational factors. The findings highlight the need to shift climate education from purely knowledge-based approaches to more action-oriented and experiential learning that promotes real-world application, as learners tend to engage more in accessible practices like recycling than in broader initiatives due to limited institutional support.

Despite limitations such as self-reported data, a single-school context, and a cross-sectional design, the study emphasizes a holistic approach that combines knowledge with enabling environments. Thus, it is recommended that schools strengthen action-based climate programs and provide more opportunities for environmental engagement, teachers adopt participatory and contextualized teaching strategies, policymakers enhance support and partnerships for school initiatives, and future researchers explore additional factors and use broader, longitudinal designs to better understand and improve adaptation practices.

Acknowledgement

The researcher extends sincere gratitude to all individuals who contributed to the successful completion of this study, from providing guidance and support to actively participating in the research process.

Conflict of Interest

The researcher declares that no conflict of interest exists in the conduct of this study. Although the research was conducted within the same institution where the researcher is affiliated, all procedures were carried out with objectivity and professionalism. Respondent participation was voluntary, and no incentives, coercion, or undue influence were used. The data were collected, analyzed, and interpreted impartially to ensure the integrity and credibility of the findings.

Ethical Statement

This study was conducted in accordance with established ethical standards in educational research. Prior to data collection, proper permission was secured from the school administration. Participants were fully informed about the purpose, procedures, and voluntary nature of the study, and informed consent was obtained before their participation. The rights, dignity, and welfare of the respondents were always upheld. Confidentiality and anonymity of the participants were strictly maintained, and all data gathered were used solely for academic purposes. The study adhered to the principles of integrity, transparency, and respect in the collection, analysis, and reporting of research findings.

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