

# FOSTERING UNDERSTANDING: EXPLORING AND EXCHANGING CLIMATE CHANGE PERSPECTIVES AMONG MIDDLE SCHOOLERS FROM DIVERSE SOCIOECONOMIC BACKGROUNDS

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## ABSTRACT

Climate change is a global threat to a country's environment, health, and economy. Socioeconomic factors influence perspectives about the issue, making education crucial in promoting sustainable development. This qualitative hermeneutic phenomenological study examined middle school students' perspectives on climate change. The participants consisted of two groups of students from different socioeconomic backgrounds: 15 students from the L group and 15 students from the N group. A survey, an illustration activity, and focus group discussions were used in data gathering. The following were the themes that emerged in the study: (1) cognizance of climate change and its consequences, (2) climate change exacerbates poverty, (3) climate change concerns everyone on diverse levels, and (4) climate change education develops compassion, altruism, and empowerment. Climate change education is one approach to address the Sustainable Development Goals by allowing educational institutions to foster understanding with several institutions, combined with scientific training and community development programs.

**Keywords:** Climate change, climate change education, middle school, socioeconomic backgrounds, community development

## INTRODUCTION

Climate change poses a serious global threat. Moreover, its impacts on the environment, health, and economy are evident (NASA Science, 2024). The Intergovernmental Panel on Climate Change (2023) revealed the widespread damage that climate change may cause to ecosystems, livelihoods, and infrastructure, which would restrict development, particularly for the least developed countries (United Nations, 2025). In response to this, UNESCO (2023) has identified three important sustainable goals: climate action, health, and education. The world recognizes the significance of education in addressing climate change (UNESCO, 2021), with educators acting as significant catalysts (Janney et al., 2024), encouraging communities and schools to take action and share knowledge (Kolenatý et al., 2022) through climate change education (Na-Eun et al., 2020). In recent years, there have been developments in modifying the instruction to include climate change education in science (Ratinen, 2011), training student teachers in sustainability education (Garcia-Gonzalez et al., 2020), and integrating climate change education in several curricular and pedagogical approaches to teacher education programs (Akalamkam, 2023). Teaching and learning are recognized as casualties and part of the solution to climate change (Newsome et al., 2023).

Socioeconomic status is considered an important indicator of the quality of life (Nukator et al., 2023). It includes social background and income (The Open University, 2024), which can be key factors in determining the quality of life. In the Philippine context, the Philippine Institute for Development Studies (2022), outlines the income classes in the country: rich (with a household monthly income of P219,140 and up), high income (between P131,484 to P219,140), upper middle income (between P76,669 to P131,484), middle class (between P43,828 to P76,669), lower middle class (between P21,194 to P43,828), low income (between P9,520 to P21,194), and poor (less than P10,957).

Correspondingly, Lübke (2021) suggests that socioeconomic factors are affected by climate change beliefs. Cebula (2024) also stated that most of the time, individuals in a particular social class share common values, cultural interests, and social patterns. Furthermore, the resiliency of communities (Filho et al., 2022) and the approach of households to address climate change effects are shaped by average monthly income, house type, and house ownership (Okonula, 2022). Additional studies also reveal that it was universally recognized that developing countries have become accustomed to the destructive effects of climate change, yet they remain more vulnerable to economic development (Abbass et al., 2022;

Adom, 2024). Hornsey and Pearson (2024) affirmed that financially-distressed citizens perceive the greatest threat of climate change.

In the United States, there are concerns that children of color and low-income families are more likely to be affected by the adverse effects of climate change (Rubin & Nse, 2021). Weckoth and Ala-Mantila (2021) revealed that lower-income individuals are less pro-environmental, whereas those with higher socioeconomic status tend to engage in more environmentally friendly actions (Sun et al., 2020). Similarly, respondents in different sectors in the Philippines showed that those with higher education and income have greater awareness and perception of climate change (Velayo et al., 2024). On the contrary, Kim et al. (2024) revealed that Korean and Indonesian primary students exhibit high levels of climate change awareness despite cultural and socioeconomic differences. These findings correspond with Alenda-Demoutiez (2021), who argues that while socioeconomic status is not significant for developing climate change literacy, it can more likely affect how individuals act to address climate change issues.

Naguimbing-Manlulu (2021) affirms that acknowledging narratives on climate change will establish ways to address sustainable development issues. Rousell and Cutter-Mackenzie-Knowles (2019) at one point called for the establishment of new forms of anthropogenic climate change education, as they reveal that children's understanding of climate change is limited, invalid, and mostly influenced by mass media. Sato and Kitamura (2023) proposed an augmented and unified approach to climate change education that is deeply embedded within the community, particularly targeting primary and lower secondary levels (Nepraš et al., 2022). This approach aims to empower students to become agents of change (Tang, 2024), fostering active engagement and communication with their educators (Mbah, 2024). At the middle school level, students are already sharing their knowledge of climate change, including its causes, effects, and consequences, as noted by Teixeira et al. (2024). Despite these developments, there remains limited youth perspectives on how early learning experiences related to climate change shape children's understanding of its broader social implications (Jones & Davidson, 2021; Spiteri & Pace, 2023).

This study advances climate change education research by illuminating how socioeconomic factors shape middle school students' perspectives, an area that remains underexplored. By facilitating exchange sessions, the study examined how peer interactions across socioeconomic divides can expand students' climate change understanding. The findings will be invaluable for educators, curriculum

developers, and policymakers in designing more inclusive and effective climate-change education programs. Specifically, it sought to answer the following questions: (1) What are the lived experiences and perspectives of middle school students regarding climate change? (2) How do these perspectives differ across socioeconomic backgrounds? (3) What role do socioeconomic factors play in shaping students' perceptions? (4) How do exchange sessions influence students' perspectives? (5) How can educators integrate these diverse perspectives into climate change education?

Anchored in social cognition theory, which emphasizes the influence of environmental and social contexts on individual behavior, this study explored how middle school learners' lived experiences and socioeconomic backgrounds shape their understanding of climate change. The themes identified provide actionable insights for educators, curriculum developers, and policymakers seeking to design inclusive climate change education programs that foster empathy, empowerment, and sustainable action.

## MATERIALS AND METHODS

### Research design

This study employed a hermeneutic phenomenological design. Creswell and Poth (2023) define hermeneutic phenomenology as a qualitative research method that focuses on a subject's unique and subjective interpretation of experiences within a certain context. Van Manen (2016, as cited in Beck, 2021) also specified that hermeneutic design captures raw data through interviews and observations through a blend of descriptions and interpretations. This design was appropriate as the study sought to uncover how middle school students interpret and make meaning of climate change in relation to their socioeconomic backgrounds.

### Research Participants

Two groups of middle-school students were included in this study. Middle schoolers are students in the sixth, seventh, and eighth grade levels (Steven et al., 2022). First was the L group, composed of middle school students from Colegio de San Juan de Letran, Manila. The second group, called the N group, was composed of the middle-school students from Letran's adopted community, Sitio Sto Niño, Barangay North Bay Boulevard South (NBBS), Navotas City. The voluntary participation of groups was through the coordination of the Community Extension Development of Letran and the barangay coordinators of Sitio Sto Niño, Barangay NBBS.

A stratified random sampling procedure (Simkus 2023) was employed to identify the groups. Since there are twenty to thirty captured families in Sitio Sto Niño, Barangay NBBS established by its community coordinators and endorsed to the Letran Community Extension Department, fifteen middle-schoolers from Sitio Sto Niño were selected for the study. An equal number of middle-schoolers from Letran were also selected. The two groups were then divided into subgroups according to their grade level: six, seven, and eight. This ensured the representation of different groups within the population.

### Research materials and instruments

A survey questionnaire designed to explore students' perspectives about climate change, concerning their socioeconomic background, was one of the instruments used in the study. The questionnaire collects the individual's grade level, community, and socioeconomic background. Students completed an illustration activity using pen and paper to visually express their perspectives. Interview guides and audio recorders were used for the focus group discussion. Such materials and instruments are essential for supporting findings that add context and authentic examples (Busetto et al., 2020). These materials are essential in capturing data for observation and interpretation (Creswell & Poth, 2023; Van Manen, 2016, as cited in Beck, 2021).

### Data gathering procedure and analysis

Data gathering included pre-implementation, implementation, and post-implementation phases. In the pre-implementation stage, the necessary ethical considerations to be observed in the study were reviewed. The study followed the protocols of the World Health Organization (2024) for informed consent, a standard followed by all ethics review agencies in the Philippines. These included the accomplishment of consent for storage and future use of unused samples, informed consent for qualitative studies, informed assent for children/minors, and informed parental consent for research involving children. The protocol also includes a form that contains a short survey of the participant's grade level and socioeconomic background, and another empty page for their drawing activity. Following the template on informed consent, all concerned participants, including

their parents, were oriented on how the study would be conducted. The researchers, staff of the community extension, and barangay coordinators worked collaboratively to inform and obtain consent from all parties concerned. The Community Extension Department and the Research and Publication Department of Letran ensured safety through approved proposals, budget, and security measures.

The implementation phase started with written and verbal reorientation of informed consent before the actual study was conducted. The L group and N group participants were assisted by the Barangay NBBS coordinators, CED staff, and the researchers throughout the implementation phase. The participants in the study were gathered in a designated room in Letran, with their parents on standby. The first part of the data gathering was the accomplishment of a survey by the participants and a session in which they illustrated their perceptions and experiences related to climate change. The second part was a focus group discussion. The participants were encouraged to share their perspectives and experiences about climate change by answering a validated structured guide of questions. Participants' identities were confidential, as code numbers were assigned to them. After the focus group discussion, the participants were reminded once again of the privacy and confidentiality of the study. They were also informed about whom to contact should they have questions regarding their rights as research participants, including any grievances and complaints, as stated in the informed consent form. The implementation process took three to four hours.

The post-implementation process focused on the development of supplementary codes for description and thematic analysis. An independent validator further analyzed and validated the findings and the reliability of codes and themes. The validated data were used to interpret the results of this study. Following data validation and in accordance with ethical standards, data under the safekeeping of the researchers was disposed of by physically shredding hard copies and erasing audio recordings and other soft copies to avoid unauthorized access or disclosure (National Privacy Commission, 2023).

## RESULTS AND DISCUSSIONS

This hermeneutic phenomenological study focused on the subjects' unique and subjective interpretation of experiences within the context of climate change, coming from different socioeconomic backgrounds. The study included exchange sessions offering insights into how interactions with peers from different backgrounds can influence and broaden students' understanding of climate change. Below is the profile of the participants in the study:

Table 1. Socioeconomic background of the middle-schooler groups

Socioeconomic background	Grade 6		Grade 7		Grade 8		Total		%	
	L	N	L	N	L	N	L	N	L	N
Rich	1	0	0	1	0	0	1	1	7	7
High income (but not rich)	0	0	0	0	1	0	1	0	7	0
Upper middle income	2	0	4	0	2	0	8	0	53	0
Middle class	2	0	1	0	1	0	4	0	27	0
Lower middle class	0	0	0	1	1	1	2	7	13	
Low income (but not poor)	0	2	0	3	0	3	0	8	0	53
Poor	0	3	0	0	0	1	0	4	0	27

Table 1 shows the socioeconomic backgrounds of the L group and N group middle-schoolers. The majority of the L group are in the upper half of the socioeconomic levels, with twenty-seven percent (27%) as the middle class and fifty-three percent (53%) as the upper middle class. One of the fifteen L group students comes from a high-income background, while the other participant belongs to a rich socioeconomic background. One L group participant is from the lower middle class level. On the other hand, the majority of N group participants belong to the last three socioeconomic levels, with thirteen percent (13%) in the lower middle class, fifty-three percent (53%) in the low income, and twenty-seven percent (27%) in the poor sector. One participant belongs to a rich socioeconomic background.

The following themes were developed by considering the objectives of the study and the information gathered via transcription, quotation selection (particularly those that captured exchange of ideas), and coding (Naeem et al., 2023).

### Cognizance of climate change and its consequences

The participants exhibited awareness of climate change through their illustrative and verbal responses. This affirms the study of Teixeira et al. (2024) that students can communicate about climate change because of their prior

knowledge enhanced by teacher talk and scaffolding (Studhalter et al., 2021), resulting in expression of concern towards this global issue (Jones & Lucas, 2023). The subthemes below are the results of the participants' illustrations and dialogue projecting cognizance and concerns on climate change and its consequences.

*Climate change as extreme weather patterns*

One significant finding of the focus group discussion is that middle-schoolers are aware of climate change, especially those in the eighth grade, from both groups.

L8.6 presented his/her drawing in this manner.



Figure 1. Drawing Representation of Climate Change as Extreme Weather Patterns by Participant L8.6

L8.6 stated: "Climate change refers to long-term shifts in temperature, weather patterns, and natural disasters that may lead to human activities like burning fossil fuels and deforestation."

Below is the illustration of N8.2.

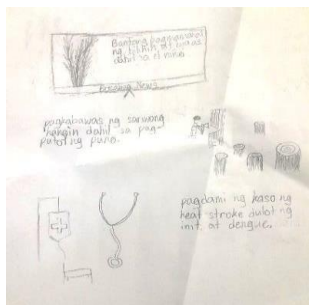


Figure 2. Illustration of the Effects of Climate Change by Participant N8.2

N8.2 stated: "It is about the threat of a shortage of food and rice due to El Niño. Second, the reduction in fresh air due to tree cutting, and the increase in cases of heat stroke caused by the heat."

While most of the seventh and eighth graders from both groups described climate change as extreme weather patterns, such as very high temperatures or flooding caused by heavier rains, as what the schools would teach them, one or two from both groups in the eighth grade would expound their understanding.

*Climate change results in persistent adversities*

Abbass et al. (2022) affirm that climate change threatens various sectors worldwide. Worse, it can also contribute to psychological strain (Taylor, 2020). In one of the discussions, N6.3 expressed: "I experience extreme heat because I attend classes for the afternoon shift; we only have an electric fan."

This is the drawing of N6.3.

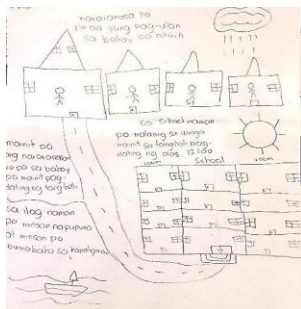


Figure 3. Drawing Depicting Extreme Heat and Flooding as Effects of Climate Change by Participant N6.3

N6.4 prompted to respond: "Yes, it's too hot at home, and then when it floods, you can't go out."

N6.5 seconded: "Many people fainted because of extreme heat."

In another group, several respondents mentioned their family's opinion about climate change.

Interviewer: *Somebody mentioned his parents can't go to work when it is flooding, what does climate change mean to you then? Is it good? Is it bad? Does it affect everyone? What do you think?"*

N7.1: "It's bad, because the people in our place were affected by the flood."

Interviewer: "How about you Number 2, what's your opinion about climate change

N7.2: "It's difficult because it's flooded."

Interviewer: "When flooding occurs and enters the house, what should be done?"

N7.2: "Be ready."

Interviewer: "So, we need to be prepared for climate change, right? Does anyone want to add anything? Number 5, what do you think climate change is? What does it mean to you? Do you think it affects you?"

N7.5: "Yes, because of the changes in the country and for every year."

Interviewer: "It feels like it happens year after year. Does it get better every year or does the effect get worse?"

N7.5: "It gets worse."

*Climate change unfavorably affects education.*

Ideally, schools are children's safe spaces, providing areas for academic, socio-civic, and emotional development, bringing communities together, and addressing the needs of the learners (Mishra & Close, 2020). However, it was also observed in different studies that the rates of learning and mental health, including academic-health concerns such as asthma, get worse because of climate change (Sheffield et al., 2017; Cianconi et al., 2020). It also affects academic task undertaking and student learning (Leal Filho et al., 2023). Both groups of participants communicated how their school endeavors are distressed by climate change.

L6.6 mentioned: "It's always raining in our place, and it's always hot, it's always flooding, too. My feelings are a bit mixed, so I often get a fever."

N7.5 in the other group mentioned: "No face-to-face classes due to strong storm."

L7.9 shared his/her drawing, mentioning: "My illustration shows the rains, and we don't have classes because of the rains."

L7.7 also showed his/her illustration, stating: "There's a storm happening outside our condominium, which means we're having online class sessions."

Below is the drawing of L7.7.



Figure 4. Participant L7.7's Drawing Depicting Online Classes During a Storm

The findings identified cognizance of climate change and its consequences as the first theme. Data showed that the participants exhibited awareness of climate change in practically the same manner, regardless of their diverse socioeconomic backgrounds. This contradicts the study of Velayo et al. (2024) that those with

higher income have greater levels of awareness and perception of climate change; however, their findings on how higher education correlates with higher levels of awareness were supported in this study with the way eighth-grade participants from both groups expounded their understanding of climate change. Notably, participants in the N group from the lower half of the socioeconomic levels expressed their persistent adversities brought by climate change. Additionally, responses from both groups of participants revealed how their education is negatively affected by climate change.

The negative responses of the two groups towards online classes in the post-pandemic correlate with the argument of Alshathry & Alojail (2024), which cites students' dissatisfaction in terms of service quality and student-student interaction, with other issues such as accessibility, engagement, distractions, and support (Farrelly et al., 2023). Bautista and Aranas (2023) also reported in EDCOM 2 that the Philippine education system faces challenges with resources to "achieve learning outcomes through level-appropriate, technology-enhanced/mediated, and evidence-based learning delivery modes" (p. 9). Nevertheless, the mentioned studies posted their recommendations, seeking effective strategies in online learning that will help improve engagement and performance (Akpen et al., 2024).

#### Climate change exacerbates poverty

The impacts of climate change, especially on the poor sector, are evident in several studies (Smith, 2022; Dang et al., 2024; Adom, 2024), with its economic, social, and political implications (Knight, 2024). Both groups of participants communicated how they witnessed and experienced poverty as one of the negative effects of climate change. When the groups were asked how their socioeconomic background influences their perception of climate change, these were the related responses:

N6.4: "We experience things differently. When we are sick, we can't handle it, but they [referring to the L group] can handle it. It's difficult because our houses are so close together."

From N7.4 in the other group: "Our place got flooded, so my mother and father couldn't go to their workplace."

This is the drawing of N7.4.



Figure 5. Illustration of Flooding and Its Impact on Family Livelihood by Participant N7.4

N7.5 seconded: "I'm sad because I feel sorry for my siblings who have nothing to eat because my mother and father can't go to work because of the flood."

L7.7 responded: "I notice(d) they experience more hardships rather (sic) than us in (when it comes to) climate change because, for example, it's hot outside they don't have AC (air conditioning) on and it can be really (sic) hot for them rather than us because we can stay at home [with air conditioning unit]."

N8.1 who is from the other group, responded: "We are more affected by climate change because for us [when temperature is too high], it's literally just the wind and that's it."

N8.2 seconded: "We also have some air in our place, but they [referring to the L group] have air conditioning, so they are better than us."

Most responses from the N group were expressions of struggles with the effects of climate change. They cited experiences that they perceived were caused by their socioeconomic background. This is attested in the study of Lübke (2021), suggesting that socioeconomic factors influence climate change beliefs. The participants' common values and social patterns were evident (Cedula, 2024) as they mentioned how their families were affected when adverse weather patterns occurred. However, their resilience (Filho et al., 2022) was also noticeable as they recognized what was lacking in their community in terms of solutions to climate-related issues. Truly, financially distressed citizens perceive the highest threat of climate change (Hornsey & Pearson, 2024). Interestingly, the exchange

session made an impact on the L group, specifically on the response of L7.7, as a realization of the adversity of their fellow human beings and students. Woolrych et al. (2020) cited the importance of awareness and taking others' perspectives in communication.

#### Climate change concerns everyone on diverse levels

This part of the focus group discussions relates to the perception of climate change, as they heard the perception of their counterpart from the partner community

N6.1 started answering in their group: "There is no difference between the poor and the rich, the perception is just slightly different because the rich can slightly change the effects because they have things that can help avoid the effects of climate change."

L6.7 seemed to agree as s/he responded: "Even if you have a nice house, it can be flooded."

L6.9 however, has a different view: "We are not severely affected by climate change because we can pay for the artificial machines like aircon, those things that can affect climate change. In my opinion we are in the same place on the (sic) earth so we are affected the same."

L6.10 seconded: "We are trying to go somewhere so we can avoid experiencing floods."

The dialogue revealed how the participants' perceptions are influenced by their socioeconomic background. Most of the L group members have coping strategies from the impacts of climate change. It was remarkable to note that one participant from the L group understands that, despite economic differences, everyone can be affected by climate change. Another remarkable observation was the response of a member from the N group, showing awareness of this point, acknowledging the insights of an L group member. Still, the N student recognized that those in the upper half of socioeconomic levels can slightly mitigate the effects of climate change because of their privileged status.

Below is the discourse shared in another group.

N7.3: "I notice(d) that even if you're rich or broke, we still experience the same thing."

L7.7: "Yes because we have lots of privileges. When it is really hot or cold outside you can just stay inside our house...or everywhere."

L7.8: "I feel that we still experience the same thing even in both public and private but we simply deal with the situation differently because of our socioeconomic background."

It was noticed that this group shared similar ideas with the other group. Interestingly, N7.3 responded like the members of the L group, unlike his/her peers in the N group. Upon reviewing the participant's profile, it was found that this student belongs to the rich socioeconomic level. In another group, below is the exchange of ideas after hearing the perception of their counterparts in another community:

N8.4: "Nothing, because we live in the same country, so I think we have the same feelings [about climate change]."

L8.9: "I don't think I experience the real challenges of climate change because I have access to air conditioners and I also have access to a home that can withstand strong storms."

L8.10: "For me, even if you are financially stable, you still can't avoid diseases or problems like floods or extreme heat, you can't control them."

The latter's exchange of ideas showed how their answers were shaped less by their socioeconomic background and more by their observations in their communities. L8.9 may have considered his/her higher socioeconomic background as an advantage in temporarily resolving difficulties brought about by climate change, yet s/he acknowledged that s/he may not have yet experienced the real challenges of climate change. Similarly, L8.10 emphasized that socioeconomic background may not be a guarantee to shield one from the effects of climate change. In contrast, N8.4, who came from the lower half of the socioeconomic level, expressed belief that everyone is compromised by the

adverse effects of climate change. Despite being at the eighth-grade level, the students showed awareness not only of their communities but also of others. Once again, the exchange session provided an opportunity for awareness and encouraged taking others' perspectives.

The findings show that middle-schoolers have similar perspectives on climate change regardless of their socioeconomic backgrounds. Climate change remains a concern for everyone, but at diverse levels, since they have different encounters based on the community they belong to. Kim et al. (2024) reported the same findings that there are high levels of awareness of climate change among individuals despite cultural and socioeconomic differences. This also affirms the study of Alenda-Demoutiez (2021), stating that socioeconomic status is not significant for developing climate change literacy, but more likely to affect how individuals act to address climate change. It was also observed that middle-schoolers in the higher grade levels exhibit more awareness of the impacts of climate change across different communities.

### Climate change education develops compassion, altruism, and empowerment

This theme emerged from the common responses of the participants in the study. They were based on the responses from the previous questions in the focus group discussion, as well as their responses to this final question on how the exchange session influences their perception about climate change.

L6.8: "...it's just disheartening because it seems like they really struggled a bit with climate change due to their challenges and difficulties in their areas."

L6.8: "If you are rich, it does not mean you understand climate change better because we don't know the feeling of those struggling with floods and strong winds."

L6.7 seconded: "Yes, because we in the middle class thought that we were not very affected by climate change, but I was really surprised by the situation of the poor with climate change, because they have no ability to change or stop the way they feel about climate change."

The dialogue appears to indicate realization and awareness among the participants, particularly in showing compassion towards their fellow students coming from significantly different socioeconomic backgrounds. In an interview by Illing (2019) with Yale professor Paul Bloom, the latter stated: "Compassion means I give your concern weight; I value it. I care about you, but I don't necessarily pick up your feelings. ... [I]f I feel compassion for you, I'll be invigorated. I'll be happy and I'll try to make your life better" (Vox, January 16, 2019). These statements encapsulated the demeanor of the L group towards the N group as observed during the focus group discussions. Vieten et al. (2024) stated that compassion is "generally positive in terms of health and well-being" (p. 4) than empathy. Furthermore, empathy can be unregulated, leading to burnout while compassion "can counteract negative aspects of empathy" (Dowling, 2018, as cited in Vieten et al., 2024).

Concerning compassion, other dialogues below show answers to the final question in the study on how the exchange session influenced their perception of climate change.

L7.10 responded: "I had reached a deeper understanding, thanks to this session. It enhanced my comprehension of how climate change can affect those people, those in the province or public school."

L7.8: "It changed because before, I thought that the poor were more affected than us who are wealthy, but that's not the case; and what I realized is that whether rich or poor, Filipinos still experience the same things from climate change."

L6.8: "It's just sad because it seems like they really struggled a bit with climate change due to their challenges and difficulties in their areas."

L6.8: "...so it seems sad so that's why my family and I try to help as much as possible, as any way that we can. (Be)cause we know the struggles and we are trying to help in any ways that we can with them. Because they can't do anything about their problems since climate change is happening so let's just help."

Following the N group's responses about the difficulties they were facing due to climate change, the L group's responses, which were characterized by compassion and altruism, emerged. Several studies showed that compassion

motivates altruism. A common definition of altruism is an action done to help another person (Cambridge University Press & Assessment, 2025). The exchange sessions provided an opportunity to take the perspectives of others. The study of Kappelmayer et al. (2022) showed that children who are self-aware and responsive to others are more likely to develop compassion and affective empathy, which benefits both individual and societal well-being. Additionally, the study of Maalouly et al. (2024) suggested that dialogue may positively influence altruistic behavior. However, Koessler et al. (2023) found that perspective-taking may encourage pro-environmental thoughts, feelings, and intentions, but it might not be enough to elicit actual behavior. For this reason, the researchers recommend that future studies examine how perspective-taking affects other kinds of pertinent behaviors. Additionally, educators may consider incorporating climate change lessons and dialogues that will develop compassion into altruism, which will benefit the community.

Lastly, below is a dialogue in response to the question of how they describe their drawings about climate change based on their economic status.

N8.3 responded: "I'm just at home. Like, I just stay in the tree because it's so hot, it's okay."

Below is the drawing of N8.3:

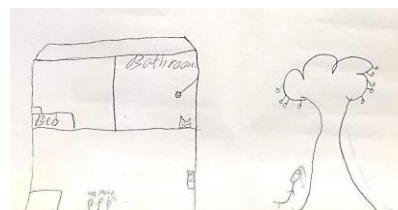


Figure 6. Participant N.8.3's Drawing Showing Safety at Home During Climate Change

N8.1 described his/her drawing: "It's hot at school, but it's fun to study."

Below is the drawing of N8.1.

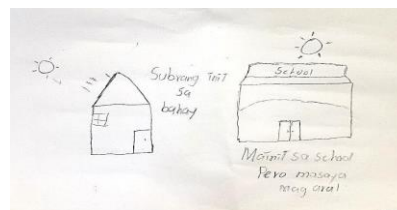


Figure 7. Participant N.8.1's Drawing Depicting School Experience During Hot Weather

The interviewer asked another participant in the study: "Are you affected? You said you are poo. Aree you affected by climate change?"

N8.5: "I do not, because we can go to many places even if we are poor. When it's too hot, ma'am, I immediately go to a big tree. I hang out under a tree."

Below is the illustration of N8.5.



Figure 8. Illustration of Seeking Shade Under a Tree During Hot Weather by Participant N.8.5

Based on the dialogue, the N group appears to have a sense of empowerment through both nature and education, despite the challenges of climate change. They manage to temporarily ease their concerns by utilizing what is readily accessible in their community. Olsen (2023) communicated that empowerment is a remedy for helplessness. Possibly, the children are given the chance to interact with their physical and emotional surroundings on their terms, which becomes their moments of empowerment (Canning, 2022).

In summary, middle-schoolers from diverse socioeconomic backgrounds demonstrated awareness of climate change and its consequences, such as

extreme weather patterns, persistent adversities, and unfavorable educational effects. They also perceived that climate change exacerbates poverty and concerns everyone on diverse levels. And lastly, they demonstrated that exchanging perspectives as a form of climate change education develops compassion, altruism, and empowerment.

When children participate in various educational programs, the results are positive, particularly in their interactions with the community, parents, and educators (Tongson, 2017). Such programs indeed empower children (Canning, 2022; Olsen, 2023; Paterson-Young et al., 2024). In the context of climate change education, exchange sessions will equip students with essential knowledge, attitudes, and skills necessary for climate change action. With a combination of scientific training and social programs, institutions can produce students who are equipped with global climate action and development (Tasquier et al., 2022; Wagner et al., 2024; Miller et al., 2024).

As the global community calls for action on climate change, educational institutions play a vital role in modifying the curriculum, training teachers, and empowering learners in addressing the Sustainable Development Goals by redirecting teaching and learning. Students assimilate climate change education through fostering understanding with several institutions through augmented awareness of climate change and its consequences, poverty reduction, social inclusion, and cultivating compassion and altruism. This will immerse learners in becoming empowered and ethical citizens in the future.

## CONCLUSION

This study examined how middle school learners' understanding of climate change is shaped by their lived experiences and diverse socioeconomic backgrounds. While students across groups demonstrate comparable levels of awareness, the intensity of their experiences differs. They recognize that climate change exacerbates poverty and affects individuals in diverse ways. Notably, engaging in perspective exchange as a form of climate change education fosters compassion, altruism, and a sense of empowerment among learners. Thus, climate change education emerges as a viable approach to advancing sustainable development goals, enabling educational institutions to promote deeper understanding through inter-institutional collaboration, scientific training, and community development initiatives toward balanced economic, social, and environmental prosperity.

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