# Climate Change Awareness and Learners' Performance in Science Class

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## ABSTRACT

This study assessed the effectiveness of climate change awareness activities and their impact on the science performance of Grade VI students in District V, Malaybalay City Division, during the 2025–2026 school year. It specifically examined how awareness activities were implemented across five areas: content quality, duration, delivery method, environmental attitudes, and sustainable practices. The study used a descriptive-correlational research design to examine the relationship between the effectiveness of these activities and students' academic performance in science. Data were collected from students at Panamucan Elementary School and Airport Village Elementary School through a survey questionnaire created by the researcher. Statistical tools such as mean, standard deviation, and Pearson correlation were used to analyze the data.

The findings showed that climate change awareness activities were considered highly effective, with the delivery method identified as a key factor in engaging learners. Students' science performance was rated at the 'Often' level, indicating they demonstrated mastery in most tasks, although some challenges remained with higher-order thinking and procedural skills. Additionally, the results revealed a significant positive correlation—meaning that as the effectiveness of awareness activities increases, students' science performance tends to improve. This suggests that well-designed environmental education initiatives help students develop a deeper understanding of scientific concepts and lead to better academic outcomes.

The study concludes that climate change awareness activities help learners connect abstract environmental ideas with practical understanding. However, additional instructional support is needed to enhance students' higher-order thinking further and attain full mastery. It is recommended that school leaders integrate these activities into the science curriculum, that teachers use localized, hands-on strategies, and that learners actively engage in inquiry-based learning to boost their analytical skills and environmental responsibility.

**Keywords:** Climate Change Awareness, Science Performance, Environmental Education, Sustainable Practices, Malaybalay City Division

## INTRODUCTION

Climate change is an emerging global problem that has cut across every sphere of life, including education. In the Malaybalay City Division, District V, many social studies students are not well informed about environmental sustainability and climate-related issues. This ignorance renders the student incompetent in their efforts to foster responsible behavior and take active action on climate change. As such, the effectiveness of climate change awareness activities needs to be assessed in order to enhance their knowledge and attitudes towards sustainability.

Past research has indicated that climate change education positively influences students' climate literacy. Aeschbach et al. (2025) found that climate change education significantly affects students' knowledge and attitudes, and Monroe et al. (2019) emphasized the importance of engagement and meaningful teaching strategies for influencing students over the long term. Likewise, a study by Bhattacharya et al. (2021) emphasized the

importance of extensive, well-planned programs in educational institutions for effectively developing environmental awareness.

Though the literature on climate change education is extensive, much of it focuses on general climate literacy rather than on local contexts or specific effects, such as those in social studies courses. Minor evidence exists regarding the direct effect of climate change awareness activities on social studies students' perceptions of environmental sustainability in District V of the Malaybalay City Division. This gap highlights the importance of the empirical study to determine the effectiveness of the customized awareness program in this learning environment. It is important to conduct this study because enhancing students' knowledge of environmental sustainability is the next step toward advancing responsible citizenship and community resilience amid climate change. The result will provide evidence-based information to help educators and policymakers improve the social studies curriculum and instructional approaches. The long-term objective of sustainable development is ultimately achieved through this research, which aims to enable students to participate actively in climate solutions in their communities.

The current research is based on the Social Cognitive Theory (SCT) coined by Albert Bandura (1986). The Social Cognitive Theory is highly applicable, as it posits that learning occurs in a social context through observation, modeling, and imitation of others' behavior, attitudes, and emotional responses. This is particularly necessary regarding the value-based and complicated issues such as climate change. The key concepts of the theory, such as self-efficacy (belief in one's ability to behave in an environment) and reciprocal determinism (the interaction among behavior, the environment, and personal factors), directly underlie the study's variables, particularly the mechanism by which awareness activities operate. The activities provide observational and participatory experiences that enhance self-efficacy and agency, enabling students to move from learning to adopting and sustaining pro-environmental behaviors, which are vital for understanding and advancing environmental sustainability.

The schematic diagram of the study is shown in Figure 1. The success of the climate change awareness activities can be measured across five fronts: the quality of the content, the time required, the mode of delivery, the learners' attitudes towards the environment, and the practices they adopt for sustainability. All these elements will provide clear guidelines for evaluating insights and accountable movements.

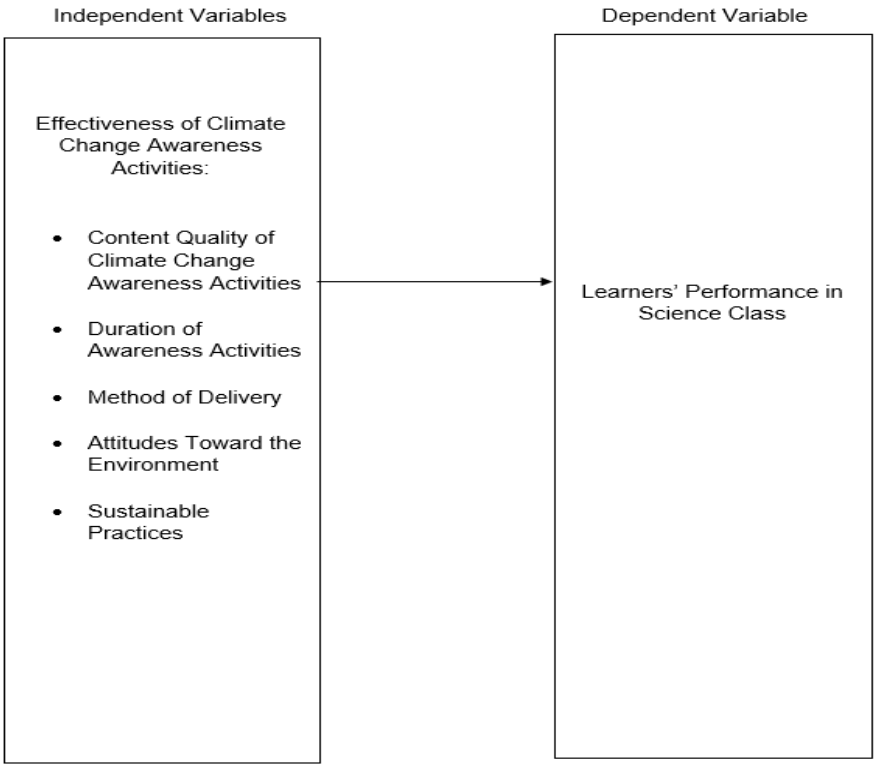


Figure 1. Schematic Diagram showing the Relationship of the Independent and Dependent Variables of the Study

This study was conducted to examine the effectiveness of climate change awareness on students' performance in their science class in District V, Malaybalay City Division, for the School Year (SY) 2025-2026.

Specifically, it answered the following questions:

1. What is the level of effectiveness of climate change awareness activities in enhancing learners' understanding in terms of content quality of climate change awareness activities, duration of awareness activities, method of delivery, attitudes toward the environment, and sustainable practices?

2. What is the level of learners' performance in science class?

3. Is there a significant relationship between the level of effectiveness of climate change awareness activities and the level of learners' performance in science class?

**Hypothesis of the Study**

The hypothesis was tested at a 0.05 level of significance.

Ho: There is no significant relationship between the effectiveness of climate change awareness activities and learners' performance in science class.

## METHODS

**Research Design**

This study employed a descriptive–correlational research design to examine the effectiveness of climate change awareness activities and their relationship to learners' performance in Science. The design was appropriate because it allowed the researcher to describe the level of effectiveness of the awareness activities and determine whether a significant relationship existed between these activities and students' academic performance. Data were collected through a survey questionnaire administered to the learner-respondents. Both descriptive and inferential statistical techniques were used to analyze and interpret the data.

**Research Locale**

The study was conducted in Panamucan Elementary School and Airport Village Elementary School, both located in District V of the Malaybalay City Division, Bukidnon, Philippines. Malaybalay City serves as the capital of Bukidnon Province and had a population of 190,712 according to the 2020 census. The city is known for its cool climate and is sometimes referred to as the South Summer Capital of the Philippines.

The municipality of Impasugong geographically bounds Malaybalay in the north, Lantapan in the west, Valencia City and San Fernando in the south, and Cabanglasan and Agusan del Sur in the east. The city comprises 46 barangays organized into five geographical districts: Poblacion District, North Highway District, South Highway District, Basakan District, and Upper Pulangi District.

The selected schools are among the public elementary schools that implement national educational programs related to environmental awareness and sustainability. These schools also serve diverse learners from both urban and rural communities. Because of these characteristics, the locale provided an appropriate setting for examining the effectiveness of climate change awareness activities and their relationship to learners' academic performance.

**Respondents of the Study**

The respondents of the study were Grade 6 learners enrolled in Panamucan Elementary School and Airport Village Elementary School in District V of the Malaybalay City Division. A total of 100 Grade 6 learners participated in the study. Table 1 presents the distribution of respondents by section. Grade 6 learners were selected because they are expected to demonstrate higher levels of environmental awareness and to understand concepts related to climate change and sustainable practices.

**Sampling Procedure**

The study utilized a complete enumeration of all Grade 6 learners in the selected schools. While this approach ensured full participation within the target group, future studies may consider using random sampling techniques to improve generalizability and reduce sampling bias.

**Research Instrument**

The study utilized a researcher-developed survey questionnaire composed of two parts.

Part I assessed the effectiveness of climate change awareness activities in terms of content quality, duration, delivery method, environmental attitudes, and sustainable practices. The responses were measured using a five-point Likert scale.

Part II measured learners' academic performance in their science class. Data for this section were obtained from the learners' official Science performance records.

**Validity and Reliability of the Instrument**

To ensure the validity and reliability of the research instrument, the questionnaire underwent pilot testing with 30 participants who had characteristics similar to those of the target respondents but were not included in the final sample. Content validity was established through expert evaluation to determine whether the items were clear, relevant, and aligned with the study's variables.

Reliability was assessed using Cronbach's Alpha to determine the internal consistency of the instrument. The analysis yielded a Cronbach's alpha of 0.865, indicating high reliability and suitability for use in the main study.

**Data Gathering Procedure**

The researcher followed a formal administrative process before collecting data. A request letter was submitted to the Dean of the Graduate School and subsequently forwarded to the Schools Division Superintendent for approval. After obtaining the necessary authorization, coordination was conducted with the Public Schools District Supervisor and the school heads of the participating schools.

Upon approval, parental consent and learner assent were secured in accordance with ethical standards. The questionnaires were then distributed to the respondents, who were given adequate time to complete them. Data regarding learners' Science performance were obtained from official class records. After the questionnaires were collected, the responses were coded, tabulated, and prepared for statistical analysis.

**Scoring Procedure**

The data were interpreted using the rating scales below. For the level of effectiveness of climate change awareness activities, the mean was interpreted using the Five-Point Likert Scale.

Level of Effectiveness of Climate Change Awareness Activities

| Scale | Range | Qualitative Description | Qualifying Statement |
|---|---|---|---|
| 5 | 4.20-5.00 | Very Highly Effective | Effectiveness is noted 9-10 times out of ten situations |
| 4 | 3.40-4.19 | Very Highly Effective | Effectiveness is noted 7-8 times out of ten situations |
| 3 | 2.60-3.39 | Moderately Effective | Effectiveness is noted 5-6 times out of ten situations. |
| 2 | 1.80-2.59 | Less Effective | Effectiveness is noted 3-4 times out of ten situations |
| 1 | 1.00-1.79 | Not Effective At All | Effectiveness is noted 0-2 times out of ten |

Learners' Performance in Their Science Class

| Scale | Range | Qualitative Description | Qualifying Statements |
|---|---|---|---|
| 5 | 4.20-5.00 | Always | Mastered 5 out of 5 instances |
| 4 | 3.40-4.19 | Often | Mastered 4 out of 5 instances |
| 3 | 2.60-3.39 | Sometimes | Mastered 3 out of 5 instances |
| 2 | 1.80-2.59 | Rarely | Mastered 2 out of 5 instances |
| 1 | 1.00-1.79 | Never | Mastered 0-1 out of 5 instances |

**Statistical Treatment of Data**

The following statistical tools were used in analyzing the data:

The mean and standard deviation were used to assess the effectiveness of climate change awareness activities.

Mean and standard deviation were also used to describe the level of learners' performance in Science.

The Pearson Product–Moment Correlation Coefficient (Pearson r) was used to assess the relationship between the effectiveness of climate change awareness activities and learners' performance in Science.

**Limitations of the Study**

This study has several limitations that should be considered when interpreting the findings. First, the study utilized a descriptive–correlational design, which limits the ability to establish causal relationships between climate change awareness activities and learners' academic performance.

Second, the study relied on a researcher-developed questionnaire, which, although validated and reliable, may benefit from standardized measurement tools to strengthen its validity further.

Third, the data were collected from a limited number of schools within a single district, which may limit the generalizability of the findings to other educational contexts.

Finally, other relevant variables, such as teacher effectiveness, parental support, and access to learning resources, were not included in the analysis. These factors may also influence learners' academic performance and should be considered in future research.

**Ethical Considerations**

Ethical principles were strictly observed throughout the study. Informed consent was obtained from the parents or guardians of the participating learners, while assent was secured from the learners themselves prior to participation. Participants were informed about the purpose of the study, the procedures involved, and their right to withdraw at any time without penalty.

Confidentiality and anonymity were ensured by assigning identification codes instead of using participants' names. All data collected was used solely for research purposes and was stored securely to protect participants' privacy. These measures ensured that the respondents' rights, dignity, and welfare were fully protected throughout the research process.

## RESULTS AND DISCUSSION

This chapter presents the results, analysis, and interpretation of the data gathered from the respondents. The findings are presented in accordance with the study's research questions. Specifically, the study examined the

effectiveness of climate change awareness activities in enhancing learners' understanding across content quality, duration, delivery methods, attitudes toward the environment, and sustainable practices. It also determined the level of learners' performance in Science and examined whether a significant relationship exists between climate change awareness activities and learners' performance in Science.

The interpretation of the results is supported by related literature and grounded in Social Cognitive Theory (Bandura, 1986), which explains how learning occurs through observation, experience, and interaction between environmental and behavioral factors.

**Level of Effectiveness of Climate Change Awareness Activities**

Table 1 presents the overall level of effectiveness of climate change awareness activities in enhancing learners' understanding.

Table 1. Level of Effectiveness of Climate Change Awareness Activities

| **Variable** | **Mean** | **SD** | **Interpretation** |
|---|---|---|---|
| Content Quality | 4.38 | 0.354 | Very Highly Effective |
| Duration of Activities | 4.25 | 0.379 | Very Highly Effective |
| Method of Delivery | 4.33 | 0.310 | Very Highly Effective |
| Attitudes Toward the Environment | 4.25 | 0.372 | Very Highly Effective |
| Sustainable Practices | 4.32 | 0.403 | Very Highly Effective |
| Overall Mean | 4.31 | 0.364 | Very Highly Effective |

Table 1 shows that climate change awareness activities were perceived as very highly effective in enhancing learners' understanding, with an overall mean of 4.31. All sub-variables obtained means above 4.20, indicating that learners strongly perceived the activities as effective in improving their understanding of environmental concepts and sustainable practices.

Among the variables, content quality had the highest mean (4.38), suggesting that learners found the materials and information presented during the activities clear, relevant, and informative. This indicates that well-structured educational content plays an important role in helping students understand environmental issues such as climate change. The method of delivery (4.33) and sustainable practices (4.32) also received very high ratings, indicating that interactive teaching approaches and practical environmental activities effectively facilitated learning. Similarly, the duration of activities (4.25) and attitudes toward the environment (4.25) were rated as very effective, suggesting that the awareness programs provided sufficient time and meaningful experiences that influenced learners' environmental values and behaviors.

The relatively low standard deviations indicate consistency among respondents, suggesting that learners shared similar perceptions of the activities' effectiveness. The findings suggest that climate change awareness activities can effectively improve students' environmental knowledge, attitudes, and behaviors when they are delivered through well-designed content and engaging instructional strategies. Schools can therefore integrate climate education into science instruction as a complementary strategy to strengthen learners' environmental literacy. Furthermore, the results highlight the importance of experiential learning approaches such as hands-on activities, environmental campaigns, and community-based environmental programs. These strategies allow students to apply scientific concepts in real-life situations, thereby strengthening both understanding and environmental responsibility.

The results support the findings of Probst et al. (2025), who reported that climate change education programs significantly improve learners' environmental knowledge and awareness. Similarly, Gupta et al. (2024) found that environmental awareness activities contribute to improved student engagement and conceptual understanding in science education. The findings also align with UNESCO (2021), which emphasized that climate change education should promote not only knowledge but also attitudes and sustainable behaviors among learners.

From the perspective of Social Cognitive Theory (Bandura, 1986), the effectiveness of these activities can be explained by observational learning and reciprocal determinism. Climate awareness activities provide students with opportunities to observe environmental practices, participate in sustainable behaviors, and interact with peers and teachers. Through these experiences, learners develop environmental self-efficacy and internalize pro-environmental behaviors, which strengthen their understanding of environmental issues.

**Level of Learners' Performance in Science Class**

Table 2 presents the overall level of learners' performance in Science.

Table 2. Level of Learners' Performance in Science Class

| Variable | Mean | SD | Interpretation |
|---|---|---|---|
| Learners' Performance in Science | 4.11 | 0.275 | Often |

Table 2 shows that learners had a mean score of 4.11, interpreted as "Often," indicating that students generally performed well in their Science class. The low standard deviation of 0.275 suggests that learners exhibited relatively consistent performance levels across the different indicators of science learning. This result indicates that most learners demonstrated basic science skills, such as using scientific tools, explaining natural phenomena, participating in group activities, and completing science tasks. However, the interpretation of "Often" also suggests that there is still room for improvement toward achieving mastery-level performance.

The findings imply that learners possess adequate science skills and conceptual understanding, but further instructional support may be needed to strengthen higher-order thinking skills such as reasoning, analysis, and scientific explanation. Integrating environmental education activities into science instruction may further improve learners' academic performance by providing meaningful contexts for applying scientific knowledge.

The results support UNESCO's (2021) findings, which emphasized that environmental education programs help improve students' science learning by connecting scientific concepts to real-world environmental issues. Similarly, Frontiers in Education (2025) reported that sustainability-based learning activities can enhance learners' engagement and improve their scientific understanding. From the perspective of Social Cognitive Theory (Bandura, 1986), learners' science performance is influenced by the interaction between personal factors (knowledge and skills), environmental factors (learning activities and classroom environment), and behavioral factors (participation and engagement in learning tasks). Climate awareness activities provide opportunities for learners to observe and practice scientific processes, thereby strengthening their academic performance.

**Relationship Between Climate Change Awareness Activities and Learners' Performance in Science**

Table 3 presents the correlation between the effectiveness of climate change awareness activities and learners' performance in Science.

Table 3. Relationship Between Climate Change Awareness Activities and Learners' Performance in Science

| Variable | r | p-value | Interpretation |
|---|---|---|---|
| Content Quality | .187 | .062 | Not Significant |

| | | | |
|---|---|---|---|
| Duration | .258 | .010 | Significant |
| Method of Delivery | .489 | .000 | Significant |
| Attitudes Toward the Environment | .440 | .000 | Significant |
| Sustainable Practices | .366 | .000 | Significant |
| Overall Relationship | .484 | .000 | Significant |

Table 3 shows a moderate positive relationship (r = .484, p = .000) between the effectiveness of climate change awareness activities and learners' performance in Science. Since the p-value is less than the 0.05 level of significance, the null hypothesis is rejected. This indicates that climate change awareness activities are significantly associated with learners' performance in Science.

Among the variables, method of delivery (r = .489) showed the strongest relationship with science performance, followed by attitudes toward the environment (r = .440) and sustainable practices (r = .366). These results suggest that interactive teaching approaches, positive environmental attitudes, and practical environmental behaviors contribute significantly to learners' science performance. However, content quality (r = .187) did not show a statistically significant relationship with science performance. This suggests that while well-designed instructional content improves understanding, it may not directly influence academic performance unless combined with engaging teaching strategies and experiential learning activities.

Although the relationship is statistically significant, the strength of the correlation (r = .484) indicates a moderate effect size, suggesting that awareness activities contribute to, but do not fully explain, learners' science performance. Other academic and environmental factors may also play important roles.

The findings highlight the importance of teaching strategies and experiential learning approaches in improving science performance. Schools should therefore emphasize student-centered learning strategies such as hands-on activities, group discussions, and environmental projects to strengthen science learning outcomes. Moreover, environmental awareness programs should be sustained over time to ensure that learners continuously develop environmental knowledge, skills, and positive attitudes.

The results support the findings of Probst et al. (2025) and Gupta et al. (2024), who reported that environmental education programs significantly improve students' engagement and academic performance in science-related subjects. Similarly, Kuthe et al. (2020) emphasized that climate change education helps develop scientific thinking and environmental responsibility among learners. The findings also support Social Cognitive Theory (Bandura, 1986), which explains that learning occurs through interaction between the learner, the environment, and behavior. Climate change awareness activities create an interactive learning environment where students observe sustainable practices, engage in environmental activities, and develop self-efficacy. These experiences reinforce both environmental awareness and academic learning in science.

## CONCLUSION

Based on the above findings, this study concludes as follows:

Awareness campaigns on climate change are highly effective, indicating that well-structured content and a variety of delivery strategies significantly enhance the learning process among learners. This success is a strong indicator that hands-on, repeated sessions that integrate environmental topics into the learning process can effectively convert complex scientific concepts into internalized knowledge. Consequently, these activities can be used to teach effectively, ensuring high engagement and the necessary environmental literacy.

There is also a high, steady level of proficiency in science, with most of the skills mastered in 4 out of 5 instances. The transition of Often to Always is, however, impeded by the difficulty of procedure complexity and higher-

level reasoning. It means that, with solid basic skills, students require additional instructional assistance to master analytical and experimental tasks fully.

The results indicate a moderate positive relationship between the effectiveness of climate change awareness activities and learners' performance in Science. However, this relationship should be interpreted with caution, as correlation does not imply causation. While the findings suggest that well-designed and interactive awareness activities are associated with improved science performance, they do not establish that these activities directly determine academic outcomes.

The results further imply that instructional strategies, particularly the method of delivery, play a more substantial role than content alone in supporting learners' performance. This highlights the importance of experiential and student-centered learning approaches in enhancing science learning outcomes.

## RECOMMENDATIONS

Based on the findings, schools are encouraged to integrate climate change awareness activities into the Science curriculum through structured, interactive approaches. Teachers should prioritize learner-centered strategies, such as hands-on experiments, environmental projects, and inquiry-based activities, to enhance both conceptual understanding and the application of scientific knowledge.

School administrators may design professional development programs that strengthen teachers' ability to deliver climate education effectively, with a particular focus on interactive teaching methods that promote engagement and critical thinking.

Future researchers are encouraged to employ random sampling techniques to reduce sampling bias and improve the representativeness of participants. The use of experimental or quasi-experimental research designs is also recommended to establish better causal relationships between climate awareness activities and academic performance.

Additionally, future studies may incorporate standardized assessment tools alongside researcher-developed instruments to enhance measurement validity. Including additional variables such as teacher effectiveness, parental support, and access to learning resources may provide a more comprehensive understanding of the factors influencing learners' academic performance.

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