



Assessing School Children's Awareness of Climate Change and Its Impact on Human Health

Hema Divakar^{1*}, Swati Mahajan², Anuj Dandotia³, Mrunmayee Velukar⁴, Kritika Gupta⁵, Pallavi SP⁶, Sheetal Joshi⁷ and GV Divakar⁸

¹Senior Consultant, ObGyn, CEO and Chairman - Asian Research and Training Institute for Skill Transfer (ARTIST), Medical Director - Divakars Speciality Hospital, Bengaluru, India

²Director Technology Innovations and Health Systems, South Asia, PATH, Bengaluru, India

³Lead SACH, CHRI, Bengaluru, India

⁴Program Officer, Climate and Health, PATH, Bengaluru, India

⁵Senior Officer - Communications and Knowledge Management, CHRI, Bengaluru, India

⁶Research Lead - ARTIST, Bengaluru, India

⁷Project Manager - ARTIST, Bengaluru, India

⁸Managing Director - Divakars Speciality Hospital, Bengaluru, India

***Corresponding Author:** Hema Divakar, Senior Consultant, ObGyn, CEO and Chairman - Asian Research and Training Institute for Skill Transfer (ARTIST), Medical Director - Divakars Speciality Hospital, Bengaluru, India.

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Abstract

Objective: Climate change is the significant global challenge with profound impact on children's health and well-being. Despite their unique vulnerability to climate-related shocks, children's perspectives are often overlooked in climate policies and programs. ARTIST for Her, in collaboration with the Sustainable Action for Climate and Health (SACH) Initiative, conducted a study to assess climate change awareness among school-going children in Bengaluru and Kolar.

Methodology: This cross-sectional study assessed the knowledge, attitudes, and practices (KAP) of 1,054 schoolchildren (grades 7–10) regarding climate change and its health impacts. Data were collected using a pre-tested, structured questionnaire and analysed using descriptive and inferential statistics to explore key predictors of KAP. Ethical approval was obtained, informed consent ensured, and responses anonymized to protect privacy. While potential limitations such as sampling and response biases were acknowledged, clear instructions and validation techniques ensured data accuracy and reliability. Survey was conducted in Bengaluru and Kolar with 1054 students of seventh, eighth, ninth and Tenth grades. The gender structure of the participants in the study comprises 56.2% of Girls and 43.8% boys.

Results: The survey results reveal insightful trends about climate change awareness and perceptions. While over half of the students (50.1%) reported being "very familiar" with climate change, a significant 33.5% remain unsure, highlighting knowledge gaps. Students demonstrated strong awareness of visible climate impacts, such as extreme weather events and glacier melting, but fewer recognized the health risks associated with climate change. Tree planting (86.5%) emerged as the most favoured mitigation strategy, followed by water conservation and waste reduction. However, awareness of energy conservation seems to lag, as only 37.2% emphasized the importance of saving electricity. This may indicate gaps in education around energy efficiency. Personal responsibility was widely acknowledged, with 79.1% emphasizing individual actions to combat climate change, though males exhibited higher uncertainty than females.

Conclusion and Recommendations: The survey results call for enhancing climate change education through targeted interventions that address gaps in familiarity and understanding, especially regarding health impacts. Schools should adopt interactive and experiential learning methods, such as workshops and field activities, to engage students effectively. Promoting actions like tree planting, water conservation, and waste reduction can further sustain interest and participation. Educational content should be simplified and made relatable to bridge uncertainties, particularly among less familiar groups. Encouraging personal responsibility and fostering sustainable behaviours are essential for empowering students as active contributors to climate action and building a climate-resilient future generation.

Keywords: Climate and Health, Climate Change Awareness, Sustainable Behaviour

Background

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and which is in addition to natural climate variability observed over comparable periods [1]. Climate change continues to represent one of the greatest threats to the global environment, society and the economy. All the evidence, including air temperature, ocean temperature, melting of snow and sea level rise indicates a rise in the average global temperature [2]. While there are many natural occurrences impacting the average global temperature, human activity continues to be a main contributing factor to climate change as human activity continues to contribute towards an increased emission of greenhouse gases [3].

The ongoing challenges in addressing the climate crisis have led to significant concerns for children's rights and well-being. As climate-related events such as heatwaves, droughts, and floods become more frequent, they increasingly disrupt children's lives, displacing families, affecting access to education, and contributing to health risks. Each year, these impacts grow, highlighting the urgent need for action to protect future generations [4]. In 2021, UNICEF released the Children's Climate Risk Index (CCRI) which laid out the threat that climate change poses to children, across eight climate and environmental shocks and India's child climate risk is 7.4, thus it is imperative to engage the children in adaptation from climate change and the key stakeholders need to consider the children vulnerability while designing the policies [5].

Global studies indicate that while many school children are aware of climate change, the level of understanding regarding its impacts varies significantly, with a large portion demonstrating a good awareness of the issue, but often lacking detailed knowledge

about specific consequences on their local ecosystems and communities [6].

Despite the growing body of literature, there are notable gaps in research regarding children's awareness of climate change's health impacts thus ARTIST for Her in collaboration with Sustainable Action for Climate and Health (SACH) Initiative conducted a study to assess the awareness among school going children in Bengaluru and Kolar. This study seeks to understand how children perceive and respond to climate change challenges, including its potential impacts on health. By gaining insights into their knowledge, attitudes, and practices, the study aims to identify opportunities for enhancing awareness and inform future adaptation and mitigation efforts focused on school going children. The cross-sectional survey provided valuable insights into how school-going children perceive and act on climate change and its health impacts. The findings of the survey can be utilized to develop educational programs and interventions that address the identified gaps and promote positive behaviors.

Methodology

This study employed a cross-sectional design to assess the knowledge, attitudes, and practices (KAP) of school-going children in grades seven to ten regarding climate change and its potential health impacts. The cross-sectional approach allowed the collection of data at a single point in time, providing a snapshot of the variables of interest across a diverse population. Data were collected using a structured questionnaire designed to address the study's key objectives, focusing on the participants' understanding, attitudes, and behaviours related to climate change and health. The survey tool was pre-tested to ensure clarity and functionality before it was distributed. Students completed the survey using paper-based questionnaires, which were accompanied by detailed instructions to ensure accurate completion. Each participant was limited to submitting one survey to maintain data integrity.

The data gathered through the questionnaires were analysed using both descriptive and inferential statistical methods. Descriptive statistics were employed to summarize overall findings, while inferential statistics helped explore relationships between variables and identify key predictors of KAP on climate change. Ethical approval for the study was obtained from the relevant institutional review board, and informed consent was acquired from parents or guardians. To protect participants' privacy, all responses were anonymized and aggregated for analysis. Potential limitations of the study, such as sampling bias, reliance on self-reported data, and response bias, were acknowledged. Clear instructions were provided to participants, and data validation techniques were applied to ensure accuracy and reliability of the results.

Key findings

The survey showed high student awareness and concern about climate change, with many willing to take action. However, knowledge gaps remain, and students prefer experiential learning, like videos and workshops, to enhance their understanding.

Survey findings

Demographic profile

The survey, conducted in Bengaluru and Kolar, included 1,054 students from grades 7 to 10. Participants were 56.2% girls and 43.8% boys, with a mean age of 12.9 years. Most respondents were aged 13–14, with the highest representation from grade 7 (36%), followed by grade 8 (30.4%).

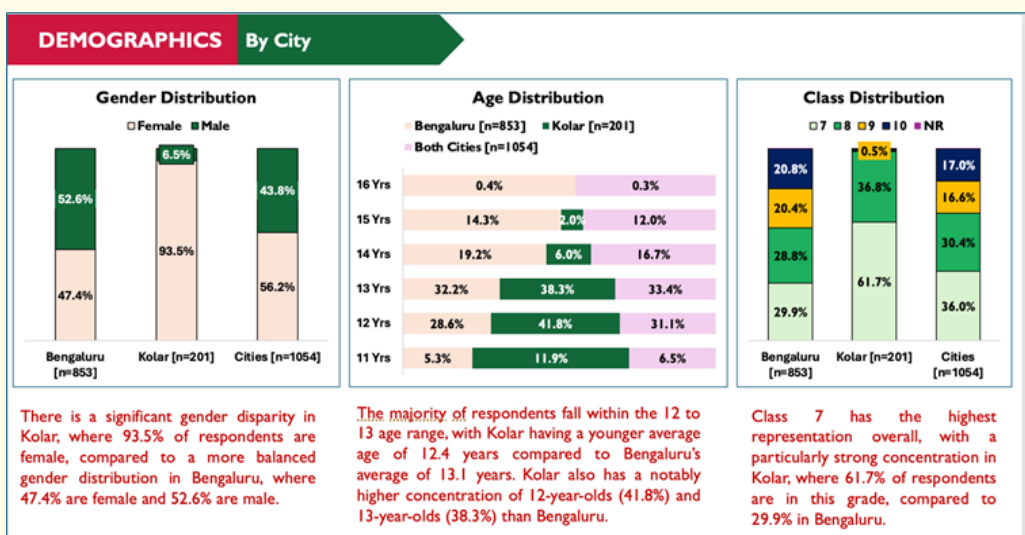


Figure 1

Familiarity with the concept of climate change

The data shows that 50.1% of students are "Very Familiar" with climate change, while 33.5% are "Not Sure," indicating a knowledge gap. Familiarity is higher among male students (54.1%) than females (47.0%).

These findings highlight the need for targeted education to improve understanding, especially among less familiar students.

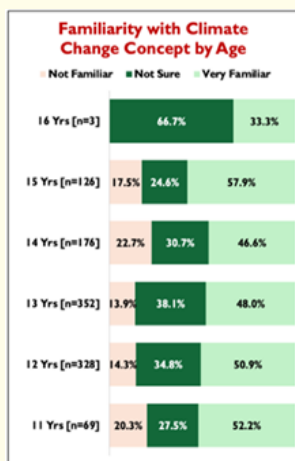


Figure 2

Perceived impact of climate change

The survey shows strong awareness of climate change impacts, with 77.1% citing extreme weather as the most significant effect, followed by glacier melting (64.3%) and sea level rise (59.0%). Water shortages (54.0%) and droughts/floods (54.2%) are also widely recognized. However, only 39.9% link climate change to health risks, suggesting a gap in awareness of its effects on well-

being. Global studies suggest that students often do not associate climate change with health risks due to inadequate knowledge, educational gaps, and a perceived climate change as a distant threat. The focus on environmental rather than health impacts in curricula and media further contributes to this disconnect. Many students also lack personal experience with climate-related health issues, making the link less apparent [7].

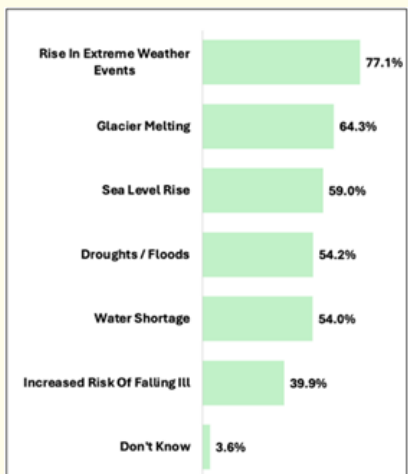


Figure 3

Possible solutions for mitigation and adaptation to climate change

The survey shows that 86.5% of respondents see tree planting as the top climate solution, followed by saving water (69.2%) and reducing waste (63.6%). Only 37.2% mentioned saving electricity,

highlighting a knowledge gap. Students more familiar with climate change suggested a wider range of solutions, emphasizing the need for stronger climate education.

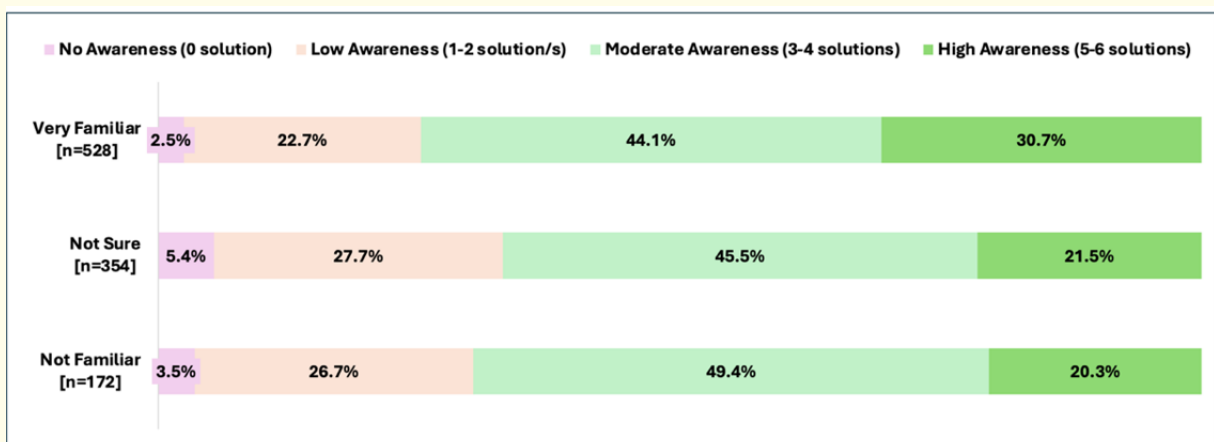


Figure 4

Student perception on the importance of environmental protection

An overwhelming majority of students (95.5%) regard environmental protection as "Very Important," reflecting a strong consensus on the critical importance of this issue. Only 2.8% of respon-

dents indicated "Don't Know," and a minimal 1.6% considered it "Not Important." This demonstrates widespread awareness and concern for environmental issues among students, though a small subset may benefit from further education to fully grasp the significance of environmental protection.

Students' interest in learning about health impacts from climate change

The survey found that 73.9% of students were eager to learn about climate change's health impacts, while 17.3% were uncertain and 8.8% were uninterested. Females (80.2%) showed more interest than males (65.8%), who had higher uncertainty (19.9%)

and disinterest (14.3%). Interest was strongest among those "Very Familiar" with climate change (81.4%) and declined with age, from 78.1% in pre-adolescents (11–12 years) to 67.4% in late adolescents (15–16 years). These findings highlight the need for tailored education to bridge awareness gaps and sustain engagement across age groups.

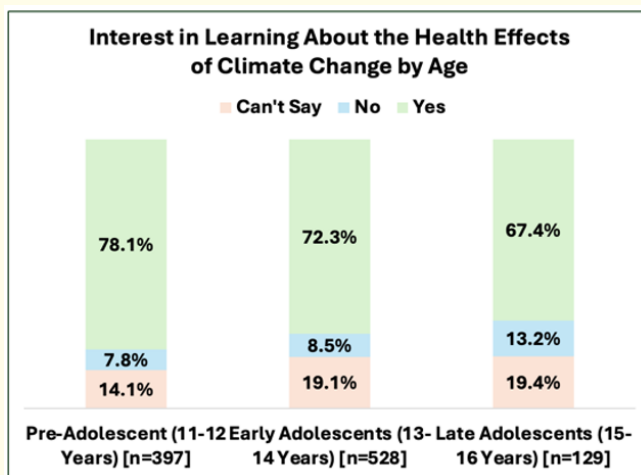


Figure 5

Perceived importance of individual actions in addressing climate change

The survey found that 79.1% of students believe individual actions are crucial in addressing climate change, while 13% are uncertain and 7.9% consider them unimportant. Female students (84.1%) were more likely to recognize their importance than males

(72.7%), who showed higher uncertainty (16.7%) and disinterest (10.6%). Familiarity with climate change also influenced perceptions, with 83.5% of well-informed students valuing individual actions, compared to 72.1% of those less familiar. These findings highlight the need for greater awareness and engagement, particularly among male and less-informed students.

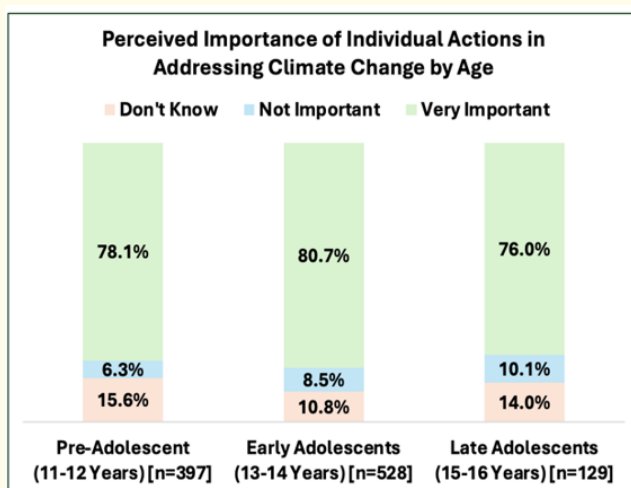


Figure 6

Possible solutions for mitigation and adaptation from climate change

The survey reveals a strong preference for nature-based solutions, with 86.5% prioritizing reforestation and 69.2% emphasizing water conservation. Waste management was acknowledged by

63.6%, while fewer students recognized transportation (54.7%) and energy conservation (37.2%) as key actions. Technological solutions had the lowest recognition (29.1%), indicating potential gaps in climate education, particularly around energy efficiency and innovation.

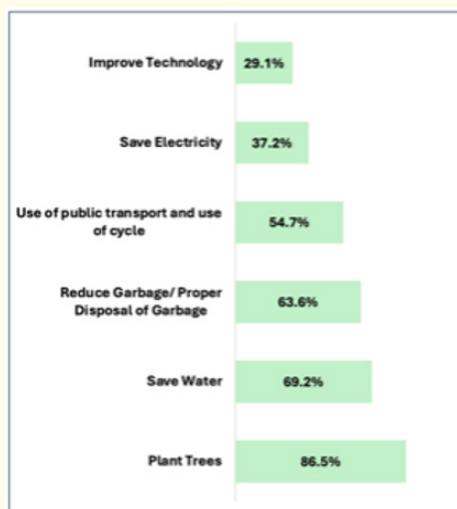


Figure 7

Students involvement in environmental activities

The disparity in participation rates suggests an opportunity for educators and community leaders to enhance the visibility and appeal of clean-up drives. Increased promotion and organization of such activities could help balance the engagement levels and encourage students to participate in a broader range of environmental actions. The higher engagement in tree-planting activities could serve as a platform to integrate or promote clean-up drives. By leveraging the existing enthusiasm for tree-planting, initiatives could be designed to seamlessly incorporate clean-up activities, thereby

increasing overall student involvement in diverse environmental efforts.

Taking proactive measures and seeking information on preventive measures

Familiarity with climate change increases the likelihood of seeking local preventive information. Among those very familiar, 48.5% actively seek information, compared to 35.5% of those unfamiliar and 39.5% of those unsure, highlighting a link between awareness and proactive engagement.

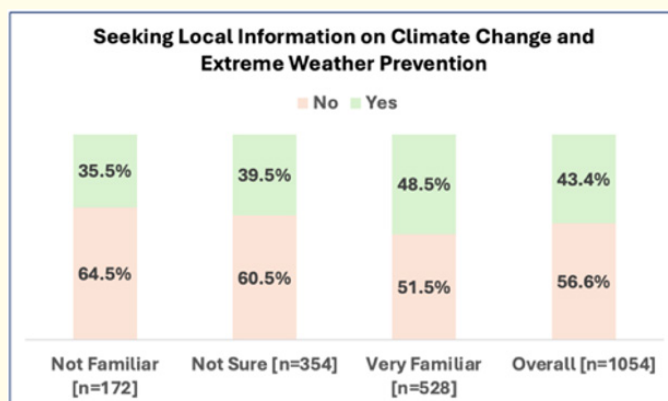


Figure 8

Personal protection measures

The high handwashing rate (98.2%) reflects effective hygiene education, reinforcing its role in health prevention. Sun protection and hydration (76.9%) are well-practiced but could improve with

further awareness. However, mosquito protection adoption is low (49.6%), highlighting the need for targeted education on preventing mosquito-borne diseases.

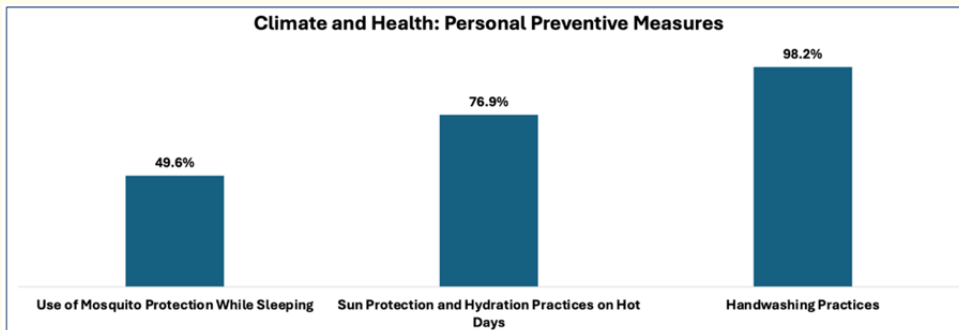


Figure 9

Challenges in mitigating climate change

A significant 69% of respondents identified the lack of community awareness as a key barrier to mitigating climate change, followed by insufficient government action (30%). This underscores the need to prioritize addressing awareness gaps. Increasing educational efforts and fostering community engagement are essential to building a more informed public, which is crucial for driv-

ing collective climate action. In parallel, advocating for stronger government policies and ensuring the effective implementation of existing measures will be critical in overcoming this challenge. Adequate resources, funding for climate initiatives, and investment in technology and capacity-building are also essential to enhance the effectiveness of climate mitigation strategies.

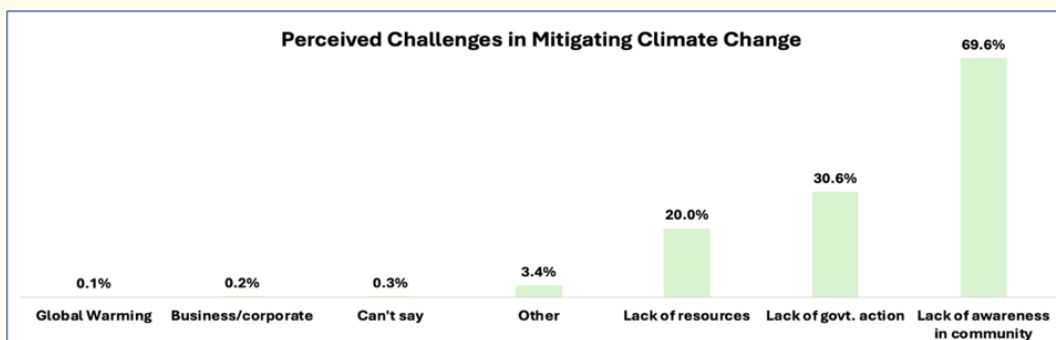


Figure 10

Perceived concern about climate change Impact on future

The survey shows that 73.9% of students are deeply concerned about climate change, while 18.5% are uncertain, indicating a knowledge gap. A small minority (7.6%) express no concern, suggesting they feel less informed or affected. These findings highlight the need for stronger climate education to address uncertainties and enhance awareness. Bottom of Form

Preferred sources of climate change information

The data shows a strong preference for digital sources, with 67.2% using the Internet and 53% relying on social media for climate information. Traditional media (62%) and educational institutions (54.9%) also play key roles. While 54.7% see social media as effective for climate awareness, 30% disagree, and 15.3% are unsure, highlighting the need for diverse and complementary communication strategies.

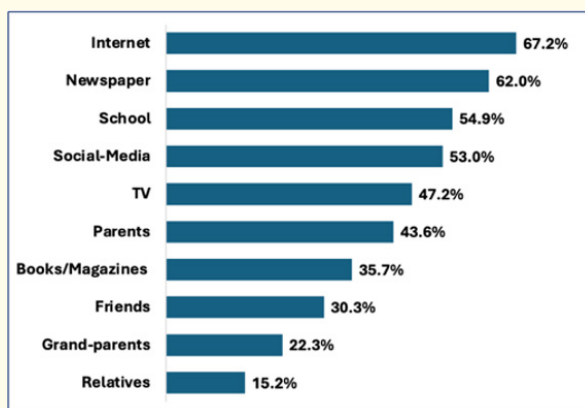


Figure 11

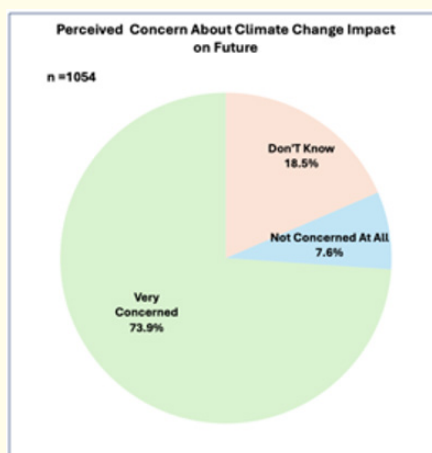


Figure 12

Ease of understanding climate change information

Most students (51.8%) report experiencing some difficulty in understanding climate change information, while a significant portion finds it easier to grasp. Improving the clarity, accessibility, and approachability of climate education materials could greatly enhance students' overall comprehension and the effectiveness of climate education initiatives.

The importance of climate change education in school curriculum

The data indicates that 71.0% of students believe incorporating climate change education into school curricula is very important, demonstrating a strong consensus on the need for comprehensive environmental education. However, 21.1% of students remain unsure, and 8.3% consider it unimportant, reflecting some degree of uncertainty and resistance. Despite this, the overall findings highlight a broad recognition of the importance of climate change education, with substantial support for integrating it into school programs, though a small portion of students hold reservations.

Preferred learning methods for learning about climate change

The data reveals that workshops and clubs are the top choices, with 49.3% of students favouring these methods for learning about climate change. Close behind are interactive websites and apps, preferred by 44.2% of students, demonstrating a clear inclination toward digital and engaging tools. School lessons and educational videos are also widely accepted, chosen by 43.9% and 41.3% of students, respectively. While books and magazines are less popular at 34.2%, they still hold considerable value, suggesting that traditional resources remain relevant in climate change education.

Recommendations

The findings of the survey can be utilized in several ways to improve climate change education and engagement among students.

Targeted climate education

The survey highlights significant gaps in familiarity with climate change, especially among female students and those unsure about the concept. Educators can design targeted interventions to

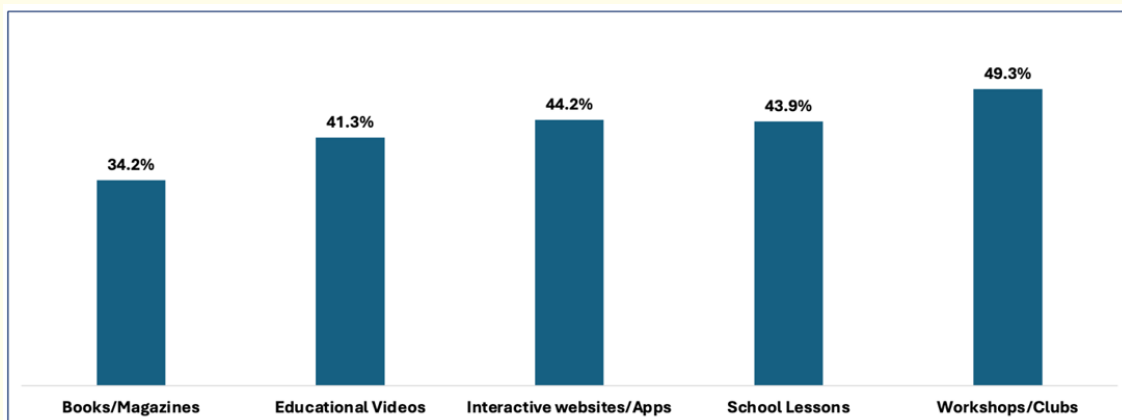


Figure 13

address these uncertainties, focusing on simplifying complex topics and using relatable examples. Tailored content could bridge the knowledge gap, particularly for those less familiar with climate change, enhancing overall understanding and engagement.

Enhancing awareness of broader mitigation strategies

With a strong preference for nature-based solutions like tree planting (86.5%) and water conservation (69.2%), efforts should be made to broaden the scope of solutions discussed. Introducing



Figure 14



Figure 15

energy efficiency and technological innovations as integral parts of climate action in curricula can fill current knowledge gaps, as evidenced by the lower emphasis on saving electricity (37.2%) and technology (29.1%).

Strengthening health education on climate change

The data shows a lack of understanding regarding the health impacts of climate change, with only 39.9% of students recognizing increased health risks. Schools can incorporate health-focused



Figure 16

climate education to raise awareness of how climate change can directly and indirectly affect health, such as through vector-borne diseases and heat-related illnesses. This would not only increase health literacy but also boost student interest in protective measures, particularly in mosquito protection (49.6%).

Increased focus on community awareness and action

The survey reveals that 69% of students see a lack of community awareness as a major challenge to climate action. This underscores the need for community-focused educational initiatives.



Figure 17

Schools and environmental organizations can collaborate to run awareness campaigns that not only educate but also mobilize students and their families to adopt climate-positive behaviours.

Addressing gender and age disparities

Given that male students show less engagement in learning about climate-related health effects and individual actions, specific

programs could be designed to engage boys more actively, perhaps through interactive, hands-on activities. Similarly, addressing the decline in interest among older students (15-16 years) could involve age-appropriate, more complex discussions on climate change impacts, encouraging them to stay engaged as they transition into higher education.



Figure 18

Leveraging digital and interactive learning

With a strong preference for learning through workshops, clubs (49.3%), and digital platforms (44.2%), educators should leverage these interactive methods for more effective climate education. Virtual reality experiences, apps, and online forums could enhance engagement and make learning more accessible and enjoyable for students. Expanding digital outreach aligns with students' reliance on the Internet and social media (67.2% and 53%) for climate information.

Promoting proactive measures and local information

The findings suggest that familiarity with climate change correlates with a greater likelihood of seeking local preventive measures. Schools can introduce initiatives that encourage students to stay informed about local climate issues and take proactive steps. Interactive projects that allow students to research and implement solutions in their own communities could foster a deeper connection to the subject.



Figure 19



Figure 20

Incorporating climate change in the school curriculum

With 71.0% of students supporting climate change education in schools, integrating it into the formal curriculum would ensure sustained and comprehensive learning. Including diverse climate-

related topics—from mitigation strategies to health impacts—would not only improve climate literacy but also equip students with the knowledge to advocate for and implement climate solutions in their communities.



Figure 21

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