Textual to Practical Climate Education: Enhancing Student-Teacher Capacity in Adopting Climate Protection Strategies

Muniza Imran Mueed

School of Leadership Foundation

Policy Research statement

Climate education should be recognized as a fundamental component of the academic curriculum, ensuring that students develop a comprehensive understanding of climate issues and the

skills necessary to address them effectively. Additionally, educators should be provided with training and resources to facilitate experiential learning opportunities, rearing a generation equipped to tackle the challenges of climate change head-on.

Abstract

The research " Textual to Practical Climate Education: Enhancing Student- Teacher Capacity in Adopting Climate Protection Strategies'' investigates climate education in government and private schools of Bahawalpur division, among students of class 4 to 8 and teachers, focusing on bridging the gap between theoretical and practical knowledge. This research uses a mixed-method approach to assess students' understanding of concepts related to climate, their practical implications, teaching methodologies, and challenges faced by teachers. The findings of this study reveal gender differences in attitudes towards climate education and variation between engagement levels of students in government and private schools. This study aligns with Sustainable Development Goals 4 and 13, aiming to foster a holistic approach to sustainable development through education.

Keywords: Climate Education, Climate Adaptation, Sustainable Development Goals,

Table of Content

1. Introduction

1.1 Background Information

Climate change is a global issue that significantly impacts people's lives, the work they do, and their quality of life.(Climate Education in the U.S, 2023) Pakistan is among the most vulnerable nations due to climate change, particularly in Southeast

Asia since it frequently experiences droughts and floods.(Fahad & Wang, 2020) The recent deadly floods that occurred during the monsoon season highlights the urgent need to prioritize adaptation measures. Education is essential in tackling climate change through promoting and encouraging sustainable practices (Rousell & Cutter-Mackenzie-Knowles, 2020) Education can play a key role in finding global solutions to climate change (Leal Filho & Hemstock, 2019). The UN Framework Convention on Climate Change, the Paris Agreement and the associated Action for Climate Empowerment (ACE) recognizes the importance of education and training to address climate change and call on governments to educate, empower and engage all stakeholders and major groups on policies and actions relating to climate change. (Climate Change Education, UNESCO)

This study is aligned with Sustainable Development Goals (SDG) 4 and 13. SDG 13, known as "Climate Action," emphasizes the critical need for capacity building within educational institutions and among students to adapt to and mitigate the impacts of climate change (Campbell et al., 2018) while SDG 4 aims to ensure inclusive, equitable, and quality education for all individuals, promoting lifelong learning opportunities. It emphasizes the importance of this goal, particularly in assessing how effectively educational curricula and instructional approaches equip students with the necessary skills and knowledge to navigate a future shaped by climate change (Mortimer et al., 2023).

Thus, by examining the connections between educational practices and students' preparedness for a climate-altered world, this study contributes directly to advancing both SDG 13 and SDG 4, fostering a holistic approach to sustainable development through education.

A climate-resilient vision for Pakistan is outlined in the National Adaptation Plan for Pakistan 2023, which also addresses social and economic imbalances and prioritizes climate-sensitive sectors like water, agriculture, forestry, coastal areas, biodiversity, education, and health. The strategy highlights the necessity of enhancing local communities and educational institutions' ability to defend themselves and develop sustainable infrastructure and services, as well as the significance of successful cooperation between the public, commercial, and civil society sectors. (National Adaptation Plan Pakistan, 2023).

This research aims to contribute to the objectives of the NAP by identifying strengths, weaknesses, and potential areas for improvement in the curriculum to cultivate a generation with the knowledge and skills necessary for sustainable and resilient futures. Specifically, the research explores the relationships between educational approaches and students' readiness to navigate a climate-altered future. In keeping with the NAP's goals. The research also attempts to offer practical policy suggestions for improving the learning environment and guaranteeing that students are equipped to handle climate-related issues. Therefore, this research is well-aligned with both the global and national goals for climate action and quality education.

1.2 Research Problem

This research seeks to explore how to enhance climate change education both textually and practically at the school level. Specifically, we aim to identify effective pedagogical approaches and resources that can help teachers develop student competencies in climate science, sustainability principles, and eco-friendly behaviors.

1.3 Objectives of the study

The objectives of this study are as follows:

1. To identify the current state of climate education in the Bahawalpur Division.

2. To identify strengths, weaknesses, and potential areas for improvement in the curriculum.
3. To bridge the gap between theoretical climate knowledge and practical readiness in Punjab government and private schools.
4. To provide actionable policy recommendations to enhance the educational environment ensuring students are well prepared to face climate challenges in Punjab.

1.4 Significance of the research

The significance of this study lies in its potential to improve the quality of climate education in the Bahawalpur Division. By enhancing climate education, it can be ensured that students acquire the essential knowledge and skills required to tackle climate change challenges. This study provides curriculum strengths, weaknesses, and growth opportunities and seeks to support the development of a generation capable of meeting the complex challenges posed by a changing climate.

The study's practical policy recommendations could improve the learning environment and eventually produce a generation of students who are prepared to actively participate in and address climate-related concerns. This study also provides valuable insights into best teaching practices, enabling educators to design engaging curricula tailored to local needs and realities.

The motivation for this study comes from the urgent need to address the challenges posed by climate change. It is essential to invest in comprehensive educational programs that aim to target climate risks.

2. Literature Review

Climate change refers to long-term changes in temperature and precipitation patterns, as well as other components such as a rise in sea levels and extreme weather events. (Abbass et al., 2022) It is primarily caused by the increase in greenhouse gas emissions, carbon dioxide in particular, which traps heat in the Earth's atmosphere. (LSE, 2021). Globally, climate change is already having an obvious impact. Millions of people are being impacted by changes in rainfall patterns, rising sea levels, melting glaciers, warmer oceans, and an increase in the frequency of extreme weather events (Ajani & van der Geest, 2021). The effects of these changes on our jobs, housing, safety, food production, and health are extensive. Some communities are more

vulnerable than others, developing countries, are particularly vulnerable, facing threats like rising sea levels that have forced some to relocate. The effects of climate change are extensive, rapid, and growing (Ajani & van der Geest, 2021). Climate change is causing observable impacts on both natural and human systems globally, as highlighted by reports from the Intergovernmental Panel on Climate Change (WHO, 2023). These impacts include rising temperatures, altered precipitation patterns, and more frequent extreme weather events, all of which are negatively affecting food and livelihood security, leading to land degradation, and causing increased displacement (WHO, 2023).

It is estimated that around 971 million people worldwide currently reside in areas with high or very high exposure to climate hazards, with the most vulnerable populations, including those in Least Developed Countries, as well as women, children, the elderly, and the poor, being disproportionately affected by the effects of climate change (Climate Change and health, WHO).

Likewise, climate change has significant impacts on Pakistan, affecting various sectors such as agriculture, health, and education. Whereby, education plays a crucial role in climate adaptation by increasing awareness, building resilience, and fostering the necessary knowledge and skills to address the impacts of climate change. In Pakistan, educational institutions and organizations are increasingly recognizing the importance of integrating climate change education into their curricula and activities. This includes educating students about the effects of climate change, assisting them in adapting to it, and motivating them to take action (Case Studies on Adaptation and Climate Resilience in Schools and Educational Settings, 2022). UNESCO's Education for Sustainable Development (ESD) program, aligned with the Sustainable Development Goal 4 (SDG4) of quality education, also aims to foster inclusive,

equitable, and lifelong learning while fostering cultural diversity and its role in sustainable development. ESD educates individuals from an early age to reduce human dependence on natural and social environments, encouraging active participation, knowledge of nature, equality, and social justice. It aims to shape human behavior and build the capacity and commitment required to establish a sustainable society. Intending to bring about societal and personal transformation, UNESCO advocates the urgent need to address environmental, social, and economic challenges holistically through its ESD for 2030 plan. Through partnerships, networking, and media, the programme enhances governments' ability to deliver high-quality Climate Change Education (CCE), knowledge sharing, policy guidance, and support for creative thinking and non-formal education initiatives (Education for Sustainable Development, 2023).

This research aims to identify what changes in the current curriculum and policies are needed to enhance student-teacher capacity building to protect the climate, in schools of Bahawalpur division. A single National Curriculum aims to provide equal quality education to all children of Pakistan (IIPS, 2021), although books of Single National Curriculum incorporate chapters related to environment and climate in every subject but the content needs to be more comprehensive and updated.

3. Methodology

3.1 Research Design

The current study adopts a mixed-method approach to investigate the textual and practical aspects of climate education among students in grades 4 to 8 across both private and government schools within the Bahawalpur division. Bahawalpur division encompasses three districts: Bahawalpur, Bahawalnagar, and Rahimyar Khan. From these districts, a total of 14 schools were selected to gauge students' understanding of

climate-related concepts and instructional approaches. The primary objectives are to assess the level of climate-related knowledge among students, examine the teaching methodologies employed by geography and science teachers, and identify the challenges they encounter while instructing on climate-related topics.

3.2 Data Sampling Method

i. Quantitative Data Collection

A structured survey was conducted among a sample of students in grades 6 to 8, drawn from both government and private schools in the Bahawalpur division. This survey aimed to gather quantitative data regarding students' comprehension of climate-related topics present in their textbooks, their ability to apply theoretical knowledge in practical scenarios, and their preferences for further learning. A random sampling technique was employed to select participants from the identified 14 schools, with 240 male and female students completing the questionnaire.

The questionnaire was developed based on climate-related chapters from the curriculum for grades 6 to 8 as per the Single National Curriculum. A checklist was devised after thorough analysis and was translated into Urdu. It included inquiries aimed at evaluating students' knowledge of climate change, their capacity to implement learned concepts in real-life situations, and their engagement in activities related to climate as outlined in their textbooks.

ii. Qualitative Data Collection

Qualitative data were gathered through focus group discussions and interviews. Focus group discussions were conducted with students in grades 4 and 5, from both private and government schools in the Bahawalpur division. The aim was to assess their understanding of climate-related concepts as presented in their textbooks and determine whether their learning was based on rote memorization or a deeper comprehension of practical implications. A total of 15 focus group discussions were conducted, involving male and female students from both school types.

Additionally, five unstructured interviews were conducted with geography and science teachers. These interviews explored the teaching methodologies employed, the

practical activities conducted, student responses to theoretical versus practical teaching approaches, the training or guidance received regarding climate education, encountered challenges, recommendations for enhancing educational quality, and expectations from the government. The implementation of the Single National Curriculum in both government and private schools was assessed as well.

3.3 Data Analysis Procedure

Quantitative data analysis involved the use of T-tests, descriptive analysis, and psychometric scales to ascertain scale, mean, median, and relationships among variables. The Statistical Package for the Social Sciences (SPSS) software facilitated this analysis.

Qualitative data analysis entailed coding and interpretation using NVivo software. Focus group discussions and interviews were analyzed to identify prevalent themes and extract meaningful insights.

4. Results and Analysis

4.1 Quantitative Data Analysis

The quantitative findings derived from structured surveys are presented and analyzed. These surveys were instrumental in assessing students' knowledge levels and practical implementation of climate-related concepts. Utilizing statistical techniques such as T-tests and descriptive analysis facilitated a comprehensive examination of the data, including measures of central tendency and relationships among variables. The quantitative analysis offers valuable insights into the effectiveness of current educational practices and highlights areas for potential improvement in climate education curriculum and pedagogy.

Table 1

Demographic Characteristics of participants.

Variables	*f*	*%*
Class		
6th standard	77	32.1
7th standard	71	29.6
8th standard	92	38.3
Gender		
Male	118	49.2
Female	122	58.0

School			
Private	120	50.0	
Government	120	50.0	

Note. *f*=Frequency, *%*=Percentage

Table 1 represents the demographic characteristics of the participants with respect to class, gender and school. Frequency distribution showed that 32.1 % students were from 6th standard, 29.6% students were from 7th standard and 38.3% students were from 8th standard. 49.2% students were male and 58.0% students were females. Private and Government school students have an equal percentage of 50.0%.

Table 2

Variables	**Group**	***f***	***Stand Error***	***95% Confidence Interval of the Difference***	***Cohen's d***

							th e Di ff er en ce		***l o th e Di ffe re nc e***
	M a l e	F e m al e					*L*	*U L*	
	M (S D)	*M (S D)*							
A CE	2 2 . 8 5 2 5	2 4 . 1 6 9 5	.8 3 5	.0 3	38	. 34 3	640	1 . 9 9	. 4 9 6

(	(
2	2
.	.
9	3
2	6
)	)

Independent Sample T –Test for Gender differences in attitudes towards Climate Education.

Note: P < .05, ACE: Attitude towards Climate Education. The results from the Independent Sample T test indicated a significant gender difference in attitude towards Climate Education.

Table 3

Independent Sample T –Test for School differences in attitudes towards Climate Education.

	Group			
bles		***ard Error of***	***Confidence d***	
		the	***Interval o the***	
		Difference	***Difference***	
	Male			
	M(SD)			

	22.8000(2.5		
5)		00	8

Independent Sample T –Test for School differences in attitudes towards Climate Education.

4.2 Qualitative Data Analysis

1. **Thematic Analysis of Interviews with Teachers:** Based on the interviews from 5 government and private schools teachers of Bahawalpur division following common themes emerged;

Theme 1: Curriculum and Resources

Description: Teachers in both types of schools mostly rely on low-cost or no-cost materials for teaching climate-related topics, with limited access to audio-visual aids. There is a consensus on the need for improvement in textbooks to provide updated and comprehensive coverage of climate-related topics.

Analysis: The reliance on alternative textbooks and limited resources highlights systemic challenges in the education sector, such as budget constraints and resource scarcity. The lack of access to updated materials affects the quality and effectiveness of climate education across schools, indicating a need for reform and investment in educational resources and an increase in budget.

Theme 2: Teaching Approaches

Description: Teachers in both government and private schools adopt a primarily textbook-oriented approach for teaching climate-related topics, supplemented by examples from real-life situations. Hands-on or experimental learning opportunities are

limited, especially for younger students of class 1 to 3, due to the inadequacies in textbook content.

Analysis: The emphasis on textbook-based teaching suggests a traditional pedagogical approach that may not fully engage students or facilitate comprehensive understanding of climate-related concepts. The limited hands-on learning opportunities further restrict students' ability to apply theoretical knowledge to practical situations, potentially hindering their overall learning experience.

Theme 3: Teacher Training and Support

Description: Teachers across both types of schools report a lack of specific training or guidelines related to teaching climate education. While they attend general training sessions occasionally, there is a notable absence of targeted support for enhancing climate education instruction.

Analysis: The absence of specialized training or guidelines reflects a gap in professional development opportunities for teachers in addressing climate education effectively. Without adequate support and guidance, teachers may struggle to incorporate innovative teaching strategies or stay updated with the latest developments in climate science and education.

Theme 4: Student Engagement and Evaluation

Description: Climate education is lacking in both private and government schools, with informal discussions and activities also notably absent. While efforts such as tree plantation drives are undertaken in the name of climate protection which can be considered as a best practice in the domain of environmental protection. Moreover, students may participate without fully understanding the underlying reasons behind such initiatives. Also, there is no formal assessment of the impact of climate education on students' understanding or actions in either type of school.

Analysis: While student engagement appears to be positive, the lack of formal evaluation mechanisms undermines efforts to measure the effectiveness of climate education initiatives. Without clear metrics for assessing learning outcomes, it becomes challenging to identify areas for improvement and ensure the overall success of climate education programs.

Theme 5: Policy and Support from Educational Authorities

Description: Teachers in both government and private schools express the need for improved textbooks and the implementation of existing policies to support effective climate education. They highlight issues such as outdated materials, resource constraints, and the lack of support from educational authorities.

Analysis: The calls for policy reforms and greater support from educational authorities underscore the importance of systemic changes in promoting effective climate education. Addressing issues such as curriculum development, resource allocation, and professional development opportunities for teachers requires coordinated efforts from policymakers, educators, and other stakeholders to build a more robust framework for climate education in schools.

1. Thematic Analysis of Focused Group Discussion with Students

Following themes emerged from private and government school students of classes 4 and 5:

Theme 1: Understanding of Earth and Environmental Responsibility

The first theme emerged from focused group discussion consisting of students' concept of Earth as their home and environmental responsibility. Private school students show a stronger sense of responsibility towards the environment, drawing parallels with caring for one's own house. While government school students

demonstrate a foundational understanding of environmental responsibility, albeit with less emphasis on personal connections.

Theme 2: Observations of Weather Changes and Environmental Challenges

This theme demonstrates the experience regarding change in weather and knowledge about environmental challenges by students from both types of school. Students observed extreme temperatures and unusual weather patterns this year.

Private school students show greater awareness of environmental challenges such as pollution or habitat destruction compared to government school students, who exhibit basic and more limited awareness of these issues.

Theme 3: Actions for Environmental Conservation

This theme shows actions suggested by private and government school students for environmental conservation, such as reducing waste or planting trees. Private school students propose more proactive and comprehensive actions for environmental conservation compared to government school students, who focus more on basic environmental cleanup efforts.

5. Discussion

5.1 Interpretation of results

The research findings has shown significant insights into the state of climate education among private and government school students of grades 4 to 8 and exploring challenges faced by teachers in instructing on climate-related topics, in the Bahawalpur division. The quantitative analysis of this research provided valuable insights into the knowledge levels and attitudes of students toward climate education. Independent sample T-tests revealed a significant gender difference in attitudes towards Climate Education, with female students showing a more positive attitude. This highlights the necessity for tailored

educational approaches to bridge these gaps, ensuring that every student should receive climate education. The qualitative analysis of the study was based on a focused group of students and interviews with teachers shared the key themes such as curriculum, teaching methods, teacher training, student engagement, and policy implications.

The integration of both quantitative and qualitative findings provided a comprehensive understanding of the state of climate education in private and government schools of the Bahawalpur division. To promote a more effective climate environment, this study emphasizes the urgent need for curriculum improvements, especially its implementation, modern teaching techniques, focused teacher training programs, and evaluation systems, in collaboration with relevant stakeholders. By critically analyzing these findings collectively, this research addresses improved quality education, and equipping students with knowledge and especially skills to effectively solve climate concerns, especially in government schools.

5.2 Comparison with existing literature

This study assessed climate education in government and private schools of Bahawalpur Division, highlighting strengths, weaknesses, and areas for improvement. The study emphasized bridging the gap between theoretical knowledge and practical implications in students and offered policy recommendations for enhancing students' preparedness for climate challenges. These findings align with existing literature, stressing the need for comprehensive climate education, localized perspectives, and capacity building within educational institutions to tackle climate change. UNESCO's Education for Sustainable Development (ESD) program highlights the significance of climate education in achieving sustainable development goals, especially goals 4 and 13.

5.3 Recommendations

1. **Tailored Educational Approaches:** Develop tailored educational approaches to bridge gender differences in attitudes towards Climate Education, ensuring that teaching methods and materials aligns with all students, regardless of gender or cultural background.

2. **Curriculum Improvements and Implementation:** Prioritize curriculum improvements, especially in the implementation of climate-related topics, by revising curriculum frameworks to integrate comprehensive climate education content and supporting teachers with resources and training.

3. **Focused Teacher Training Programs:** Provide focused teacher training programs to equip educators with the knowledge, skills, and resources needed to effectively teach climate-related topics, covering content knowledge, instructional strategies, assessment methods, and classroom management techniques.

4. **Collaboration with Stakeholders:** Foster collaboration with relevant stakeholders, including government agencies, educational institutions, non-profit organizations, and community groups, to develop and implement comprehensive climate education initiatives that address the needs of diverse learners and communities.

5.4 Limitations of the study

This study has potential limitations, restricting the depth of data collection and analysis. Although the sample size was detailed in demographic characteristics, it may not fully represent the diverse population of students in government and private schools of Bahawalpur division, and time limit due to unexpected long winter breaks and less students due to bad weather conditions, raising concerns about the generalizability of

findings. These constraints highlight the need for future researchers to work on these limitations to enhance the applicability of findings for improving climate education.

6. Conclusion

In conclusion, this research focused on the state of climate education in the Bahawalpur Division, assessing both quantitative and qualitative aspects to gain a comprehensive understanding. The findings of this research highlight the strengths, weaknesses, and areas for improvement in the curriculum, teaching methodologies, teacher training, and policy implications for enhancing students' preparedness for climate challenges. Through a mixed-method approach, the study identified significant gender differences in attitudes towards climate education, emphasized the need for curriculum enhancements, modern teaching techniques, and focused teacher training programs. The integration of both quantitative and qualitative findings underscores the urgency of addressing gaps in climate education to equip students with the knowledge and skills needed to tackle climate change effectively. By bridging the gap between theoretical knowledge and practical implications, this research aims to empower students to become informed advocates for sustainable practices, contributing to a more resilient and environmentally conscious society. However, the study also acknowledges its limitations, particularly regarding sample representation and time constraints, emphasizing the importance of future research to address these constraints and further enhance the applicability of findings for improving climate education in the region.

References

1. Abbass, K., Qasim, M. Z., Song, H., Murshed, M., Mahmood, H., & Younis, I. (2022). A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environmental Science and Pollution Research*, *29*(28), 42539–42559. https://doi.org/10.1007/s11356-022-19718-6

2. Ajani, A., & van der Geest, K. (2021). Climate change in rural Pakistan: Evidence and experiences from a people-centered perspective. *Sustainability Science*, *16*(6), 1999–2011. https://doi.org/10.1007/s11625-021-01036-4

3. Arshad, A., & Khatoon, M. (2021). Climate Change and Higher Education in Pakistan. *Turkish Online Journal of Qualitative Inquiry*, *12*, 11014–11026.

4. Campbell, B. M., Hansen, J., Rioux, J., Stirling, C. M., Twomlow, S., & (Lini) Wollenberg, E. (2018). Urgent action to combat climate change and its impacts (SDG 13): Transforming agriculture and food systems. *Current Opinion in Environmental Sustainability*, *34*, 13–20. https://doi.org/10.1016/j.cosust.2018.06.005

5. *Case Studies on Adaptation and Climate Resilience in Schools and Educational Settings*. (n.d.).

6. *Climate change*. (n.d.). Retrieved January 29, 2024, from https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health

7. *Climate change education | UNESCO*. (n.d.). Retrieved February 22, 2024, from https://www.unesco.org/en/climate-change/education

8. Climate Education in the U.S.: Where It Stands, and Why It Matters. (2023, February 9). *State of the Planet*. https://news.climate.columbia.edu/2023/02/09/climate-education-in-the-u-s-where-it-stands-and-why-it-matters/

9. *Education for sustainable development | UNESCO*. (n.d.). Retrieved January 30, 2024, from https://www.unesco.org/en/sustainable-developmen/education

10. Fahad, S., & Wang, J. (2020). Climate change, vulnerability, and its impacts in rural Pakistan: A review. *Environmental Science and Pollution Research*, *27*(2), 1334–1338. https://doi.org/10.1007/s11356-019-06878-1

11. *Global Warming in Pakistan and Its Impact on Public Health as Viewed Through a Health Equity Lens*. (n.d.). https://doi.org/10.1177/27551938231154467

12. https://plus.google.com/+UNESCO. (2018, October 10). *SDG Resources for Educators—Climate Action*. UNESCO. https://en.unesco.org/themes/education/sdgs/material/13

13. IIPS. (2021, September 10). Single National Curriculum (SNC) in Pakistan. *Imarat Institute of Policy Studies – IIPS*. https://iips.com.pk/single-national-curriculum-snc-in-pakistan/

14. Khurshid, N., Fiaz, A., Khurshid, J., & Ali, K. (2022). Impact of climate change shocks on economic growth: A new insight from non-linear analysis.

Frontiers in Environmental Science, *10*. https://www.frontiersin.org/articles/10.3389/fenvs.2022.1039128

15. Leal Filho, W., & Hemstock, S. L. (Eds.). (2019). *Climate Change and the Role of Education*. Springer International Publishing. https://doi.org/10.1007/978-3-030-32898-6

16. Mortimer, A., Ahmed, I., Johnson, T., Tang, L., & Alston, M. (2023). Localizing Sustainable Development Goal 13 on Climate Action to Build Local Resilience to Floods in the Hunter Valley: A Literature Review. *Sustainability*, *15*(6), Article 6. https://doi.org/10.3390/su15065565

17. *National Adaptation Plan Pakistan | UNFCCC*. (n.d.). Retrieved January 31, 2024, from https://unfccc.int/documents/631045

18. *Pakistan has a plan for adapting to climate change – will it work? | PreventionWeb*. (2023, November 24). https://www.preventionweb.net/news/pakistan-has-plan-adapting-climate-change-will-it-work

19. Rousell, D., & Cutter-Mackenzie-Knowles, A. (2020). A systematic review of climate change education: Giving children and young people a 'voice' and a 'hand' in redressing climate change. *Children's Geographies*, *18*(2), 191–208. https://doi.org/10.1080/14733285.2019.1614532

20. *What is climate change adaptation?* (n.d.). Grantham Research Institute on Climate Change and the Environment. Retrieved January 29, 2024, from https://www.lse.ac.uk/granthaminstitute/explainers/what-is-climate-change-adaptation/

Appendices

Questionnaire for class 6 to 8

Textual to Practical Climate Education: Enhancing Student-Teacher Capacity in Adopting Climate Protection Strategies

Questionnaire for Students

I am doing research on **"Textual to Practical Climate Education: Enhancing Student-Teacher Capacity in Adopting Climate Protection Strategies''**, sponsored by the School of Leadership foundation in collaboration with UNFPA, UNDP, and UNICEF. Your valuable opinions and information through this questionnaire will be kept confidential and your cooperation will be highly appreciated.

Personal Information

1. Name: _____(optional)
2. School: _____
3. Class: _____
4. Gender: _____

Please indicate your level of knowledge, agreement, disagreement with each of these statements regarding your education on climate Change.

1. Do you know the meaning of term “Climate change”?
ماحولیاتی تبدیلی جسے انگریزی میں Climate Change کہتے ہیں،کیا آپ اس کا مطلب سمجھتے ہیں؟

a. Well-informed

b. Partial understanding

c. Uncertain

2. Can you use maps, Google Maps, and GIS to locate the climatic zones of the world and Pakistan?
کیا آپ آب و ہوا کے لحاظ سے پاکستان یا دنیا کے دیگر خطے دیکھنے کے لیئے نقشہ جات یا گوگل میپ اور جی آئی ایس جیسے ایپ کو استعمال کرتے ہیں؟

a. I am proficient in using them.
b. I can use them to some extent.
c. I am not familiar.

3. Have you participated in activities or projects related to environmental conservation or climate protection that is written in your textbooks?
کیا آپ نے اپنے نصاب کی کتابوں میں موجود موسمیاتی یا ماحولیاتی تبدیلی پر بات چیت یا حفاظتی اقدام سے متعلق کسی پروجیکٹ میں شرکت کی ہے؟

a. Actively engaged

b. Considering participation

c. Not involved

4. Do you know the difference between mitigation and adaptation?

کیا آپ تخفیف یا موافقت کے فرق کوماحولیاتی تبدیلی کے تناظر میں سمجھتے ہیں؟

a. Yes
b. To some extent
c. No

5. How supportive do you feel your teachers are in educating students about climate change and its impacts?
کیا آپ کے اساتذہ ماحولیاتی تبدیلی اور اس کے اثرات سے متعلق تعلیم دینے میں صحیح طریقے سے مدگار ہیں؟

a. Highly supportive
b. Moderately supportive
c. Not supportive

6. Rate your understanding of climate change from 1 to 5.
ماحولیاتی تبدیلی کے حوالے سے اپنے علم کو 1 سے 5 تک کوئی نمبر دیں۔

a. Very low understanding (1)
b. Low understanding (2)
c. Moderate understanding (3)
d. High understanding (4)
e. Very high understanding (5)

7. Do you feel that what you learn about climate change in textbooks is sufficient to make a real difference in protecting the climate?
کیا آپ نے کبھی محسوس کیا ہے کہ آپ نے اپنی نصابی سے کچھ ایسا سیکھا ہے وہ ماحولیاتی حفاظتی اقدام سے حقیقی تبدیلی لانے کے لئے کافی ہے؟

a. Sufficient knowledge
b. Partially convinced
c. Insufficient knowledge

8. How confident do you feel in your ability to apply what you have learned about climate protection strategies in real-life situations?
آپ اپنی حقیقی زندگی میں ماحولیاتی تبدیلی سے متعلق حفاظتی اقدامات کرنے کیلئے کتنے پُراعتماد ہیں؟

a. Very confident

b. Somewhat confident

c. Not confident

9. Would you be interested in participating in practical activities or projects related to climate protection as part of your school curriculum?
اگر آپ کے نصاب میں ماحولیاتی تبدیلی سے متعلق اقدامات کے منصوبے شامل ہوں تو کیا آپ ان سے متعلق عملی سرگرمیوں میں شمولیت اختیار کرنا پسند کریں گے؟

a. Yes, I would be interested.
b. Maybe, it depends on the activities.
c. No, I would not be interested.

10. How do you learn about climate change?
آپ کوماحولیاتی تبدیلی کے متعلق کیسے علم ہوا؟

a. In Geography class
b. In Science class
c. In Urdu class
d. In English class
e. Others

11. Have you ever discussed climate change-related topics in your classes?
کیا آپ نے کبھی اپنی کلاس میں ماحولیاتی تبدیلی سے متعلق موضوعات پر بات چیت کی ہے؟

a. Yes

b. No

12. Is there an environmental club in your school?
کیا آپ کے سکول میں ماحولیاتی تبدیلی سے متعلق کوئی کلب ہے؟

a. Yes
b. No

Focused Group Discussion for Class 4 & 5

Class 4

1) What do you like to do outdoors?
2) Can you share any changes you have noticed about the weather, climate, or the environment recently?
3) Can you tell me the difference between weather, climate, and environment?

4) Which instrument do we use to measure the speed and direction of the wind?
5) Do you know which instrument we use to measure air pressure?
6) Have you ever wondered why the weather changes with the arrival of spring, summer, and winter?
7) "It's our responsibility to clean the environment." What is the meaning of this sentence? How can we clean our environment?
8) Do you know how many zones Earth is divided into based on climate?
9) What are the reasons for global changes in climate?
10) Have you performed activities and projects mentioned in your textbook?
11) Have you planted trees in your school?

Class:5

1) Which season do you like the most? Why?
2) When we say 'Earth is our home,' what do you mean by this statement?
3) What do you like most about nature or the environment around you?
4) Have you ever seen changes in the weather? What were they?
5) What challenges is our Earth facing?
6) What actions do you take to keep your Earth clean?
7) What is pollution?
8) What are the causes of pollution in Pakistan?
9) What do you believe are the reasons behind climate change?
10) Forest fires cause air pollution. Can you name some other causes of air pollution?
11) As a student, how can you contribute to keeping your environment clean?
12) Can you share any activities or projects you have done or are currently working on in school or the community to clean the environment?