

CLIMATE CHANGE EDUCATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT: AN OVERVIEW

Dr. Swagatam Das

Assistant Professor Educational Studies, Department of Teacher Education , RNIASE, Cuttack, Odisha Email - drswagatamdas@gmail.com

Sagarika Jena

Lecturer in Education, Maharshi College of Natural Law, Bhubaneswar, Odisha
Email - 2012sagarika.jena@gmail.com

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Abstract

Climate Change and Sustainability Education (CCSE) is necessary for societies all over the globe to promote responsible development, which includes the green economy, welfare, and environmental conservation. Establishing appropriate educational frameworks is seen to be essential for promoting green skills that guarantee healthy lives, new jobs, and just societies. The article's goal is to provide a thorough introduction to and justification for climate change education (CCE) in relation to sustainable development. For this purpose descriptive survey method has been followed. The researcher has selected a sample of 80 teachers by following the random sampling method from different reputed educational institutions of Kanpur district of Uttar Pradesh for primary data collection. Secondary data have been collected by following different books, journals etc. A Self structured questionnaire consisting of 24 items on the importance of climate education for sustainable development has been used for primary data collection. The collected data were analyzed with the help of descriptive statistics and t test in the SPSS.20 version software. The study comes to the conclusion that one of the most important ways for national governments to guarantee and exhibit their adherence to national and international frameworks concerning human rights, education, the environment, and sustainable development is to improve the education sector's response to climate change.

Keywords: Education, Environment, Sustainable, Green Economy, Development.

Introduction:

“The UN Global Action Programme (GAP) on Education for Sustainable Development (ESD) that started in 2015 and finished in 2019, was aimed at scaling up action on sustainable

development through education beyond 2019. Subsequently UNESCO developed a draft framework entitled Education for Sustainable Development: Towards achieving the SDGs". (ESD for 2030)¹. The goal of this framework is to increase the contribution of ESD to the accomplishment of all 17 Sustainable Development Goals (SDGs), with particular attention to policies, learning environments, educators, youth, and communities.

Climate change has caused and will continue to cause harm to natural and human systems worldwide (IPCC 2019; UN 2019), posing an existential danger to mankind for the rest of the 21st century and beyond (IPCC 2014). The complexity of the problems related to climate change presents significant obstacles for teaching². However, "learning about climate change can also provide opportunities for students to develop their knowledge and a range of inquiry, problem solving and critical thinking skills"³. Students' inquiries about climate change are interdisciplinary and complex in character, and it is clear that they give careful thought to the scientific, sociological, and ethical elements of the issue (Tolppanen & Aksela 2018). Additionally, new studies show that teachers are the most trusted "messengers of knowledge" in today's information age among the many others⁴.

Currently, "CCE is placed at the core of strategic targets of the Sustainable Development Goals (SDGs) not only as a means to improve awareness and capacity on climate change mitigation, adaptation and impact reduction (SDG 13) but also as an approach to education that ensures that all learners acquire the knowledge and skills needed to promote sustainable development (SDG 4). Education for people and the planet"⁵ "analyses the considerable steps required in virtually all education systems in the world (both developing and developed education systems) to prepare young people for the difficult decades ahead. "On these premises the Inter Academy Partnership (IAP) for Science, led by the Académie des sciences from France, drawing on the expertise of 29 experts from 25 academies, prepared a declaration on climate change and education that was endorsed by a large majority of the 113 academies and promulgated by IAP in December 2017"⁶.

Objectives of the study: The article's goal is to provide a thorough introduction to and justification for climate change education (CCE) in relation to sustainable development. First, by emphasizing the crucial role that education can play in confronting and reacting to CC in

¹ UNESCO 2019

² Mallon 2015; Lena, Lescamontier, Wilgenbus 2019

³ "Burke et al. 2018; IAP 2017; Tolppanen & Aksela 2018"

⁴ Corner et al. 2015

⁵ UNESCO 2016

⁶ IAP 2017

all of its complexity, it aims to show why education ought to be a more prominent and important component of the global response to CC. Secondly, it offers many interconnected explanations for why CCE need to be considered within the framework of Sustainable Development.

Hypothesis:

Hp1-The teachers agreed that the climate change education is important in the context of sustainability.

Hp2-There is no significant difference between the Science and Arts teachers Regarding the importance of Climate Change Education in the Context of Sustainability.

Hp3-There is no significant difference between the rural and urban teachers Regarding the importance of Climate Change Education in the Context of Sustainability

Methodology: The present study has been conducted by following the descriptive survey method.

Sample: The researcher has selected a sample of 80 teachers by following the random sampling method from different reputed educational institutions of Kanpur district of Uttar Pradesh for primary data collection.

Distribution of Sample:

Sample	Sub Sample	N
Subject Group	Science	38
	Arts	42
Residential Area	Rural	32
	Urban	48

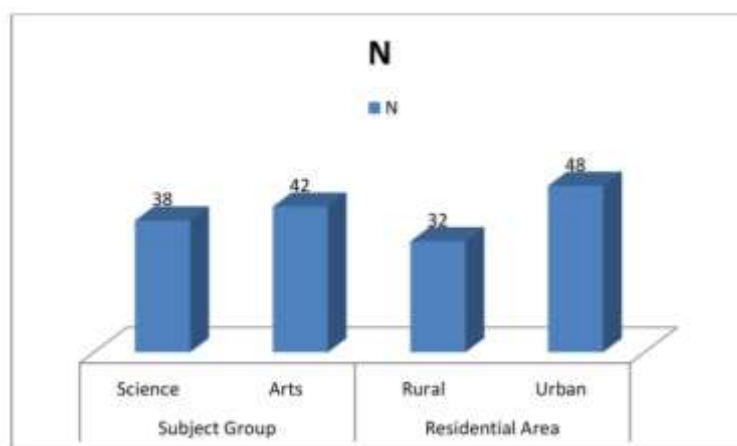


Fig. showing the distribution of sample and sub-samples.

Tools: A Self structured questionnaire consisting of 24 items on the importance of climate education for sustainable development has been used for primary data collection. It is a four

point likert scale with the response of Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). Therefore the maximum score for an individual can be 96 and the minimum score can be 24.

Statistical Technique: The collected data were analyzed with the help of descriptive statistics and t test in the SPSS.20 version software.

Data Analysis and Interpretation:

Table 1- Descriptive Statistics of the Teachers' Views Regarding the importance of Climate Change Education in the Context of Sustainability.

Parameters	Values
N	80
Minimum	28
Maximum	96
Mean	62.31
Mid Range	62
SD	17.05
SEM	1.90
Skewness	-0.11
Kurtosis	-0.87

From the above table we can see that the mean value of the teachers's views regarding the importance of climate change education in the context of Sustainability is 62.31 with the minimum value of 28 and maximum value of 96. The obtained SD value is 17.05 with the SEM range of 1.90. The calculated skewness value is -0.11 and the kurtosis value is -0.87. It is evident that the mean value is higher than the mid value which indicates that the teachers are highly agreed that the climate change education is important in the context of sustainability. Therefore the formulated hypothesis " The teachers agreed that the climate change education is important in the context of sustainability".

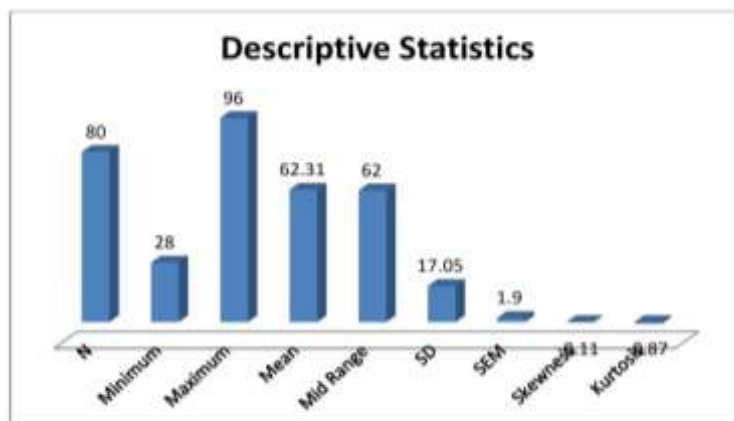


Fig. showing the descriptive statistics of the Teachers' Views Regarding the importance of Climate Change Education in the Context of Sustainability

Table 2-Difference of Science and Arts Teachers Regarding the importance of Climate Change Education in the Context of Sustainability

Group	N	Mean	SD	SEM	DF	t
Science Teachers	38	63.84	16.48	2.67	78	0.61
Arts Teachers	42	61.52	17.12	2.64		

To find out the difference between the science group teachers and the Arts group teachers regarding the importance of Climate education for sustainability t test has been applied. The above table shows that the mean value for the science teachers the importance of Climate Change Education in the Context of Sustainability is 63.84 and the SD is 16.48. On the other hand the mean value for the arts teachers for the same is 61.52 and the SD value is 17.12. The obtained t value is 0.61 which is lower than the critical value. By conventional criteria, this difference is considered to be not statistically significant. Therefore the formulated hypothesis "There is no significant difference between the Science and Arts teachers Regarding the importance of Climate Change Education in the Context of Sustainability" is retained. It means the science teachers do not differ from the Arts teachers in regard to their views on the importance of climate education in the context of sustainability.

Table 3-Difference of Rural and Urban Teachers Regarding the importance of Climate Change Education in the Context of Sustainability

Group	N	Mean	SD	SEM	DF	t
Rural Teachers	32	60.94	17.26	3.05	78	0.36
Urban Teachers	48	62.36	16.94	2.44		

To find out the difference between the teachers residing in rural areas and the teachers residing in the urban areas regarding the importance of Climate education for sustainability t test has been applied. The above table shows that the mean value for the rural teachers the importance of Climate Change Education in the Context of Sustainability is 60.94 and the SD is 17.26. On the other hand the mean value for the arts teachers for the same is 62.36 and the SD value is 16.94. The obtained t value is 0.36 which is lower than the critical value. By conventional criteria, this difference is considered to be not statistically significant. Therefore the formulated hypothesis “ There is no significant difference between the rural and urban teachers Regarding the importance of Climate Change Education in the Context of Sustainability” is retained. It means the rural teachers do not differ from the urban teachers in regard to their views on the importance of climate education in the context of sustainability.

Roles of Climate Change Education in the Sustainability

Knowledge	Attitudes, values and behaviours	Competences and capabilities
1. Knowledge of the origins and effects of climate change from both a local and global standpoint. Understand	1. Think about your role as an aspiring instructor and trainee. How will your beliefs, values, and actions about climate change and sustainability education impact how you interact with students? 2. Take into consideration the moral concerns guiding the climate discussion, such as how the Global North's consumption patterns affect the most disadvantaged people. . 3. Get familiar with the Sustainable Development	1. Develop the competencies necessary for aspiring educators to critically interact with newly discovered material, identify denial and fatalism, and speak out against them ⁹ . 2. Assist trainees in developing their sustainable ways of thinking, doing, and being by including them in UNESCO's core competencies. Ways of thinking: <ul style="list-style-type: none"> • Systems thinking competency. • Anticipatory competency (future thinking). • Critical thinking competency. Ways of practising: <ul style="list-style-type: none"> • Strategic competency.

⁹ Thew, H, Graves, C, Reay, D, Smith, S, Petersen, K, Bomberg, E, Boxley, S, Causley, J, Congreve, A, Cross, I, Dunk, R, Dunlop, L, Facer, K, Gamage, KAA, Greenhalgh, C, Greig, A, Kiamba, L, Kinakh, V, Kioupi, V, Lee, M, Klapper, R, Kurul, E, Marshall-Cook, J, McGivern, A, Mörk, J, Nijman, V, O'Brien, J, Preist, C, Price, E,

<p>what the word "Anthropocene" means⁷.</p> <p>2. Establishing a solution-based strategy to cultivate this knowledge and skills and connecting climate change education with sustainability education.</p> <p>3. Place a strong focus on environmental and social justice, emphasizing the possible effects of our actions on those who are most disadvantaged in society.</p> <p>1. Raising awareness of climate solutions by doing targeted study on "how" to bring about change, such as providing information on sustainable local, national, and global practices."Think globally, act locally."</p>	<p>Goals (SDGs) and how teaching "approaches that cultivate knowledge and global citizenship, while preparing students for curious well-informed lives" (UNESCO, 2017) can support your attitude, values, and behaviours as well as those of your students.</p> <p>4. Incorporate the BERA Manifesto into your teaching of sustainability and climate change education by working together with youth, educators, and researchers to promote common attitudes, values, and behaviors⁸.</p>	<ul style="list-style-type: none"> • Collaborative competency. • Integrated problem-solving competency. <p>Ways of being:</p> <ul style="list-style-type: none"> • Self-awareness competency. • Normative competency. <p>3. Assist students in creating pathways to climate action. This will lessen eco-anxiety and promote the development of resilience and wellbeing. Utilize Walshe et al.'s work from 2022 to encourage the growth of eco-capabilities via natural connectivity.</p>
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Teachers' Role in Fostering Climate Change Education

Activity	How this will support pedagogical insight
Showing video footage	Videos are an excellent tool for igniting discussions, drawing students in, and testing their comprehension of the nuances of teaching about sustainability and climate change.
Knowing the definition of "Anthropogenic," explaining the phrase to students, and explaining its origins .	<p>Talk about the term "Anthropogenic," which is an unofficial way of referring to the last 50 years of fast development that has caused a major shift in the planet's climate.</p> <p>Since this is not a word that is formally acknowledged in the scientific community, you should frame it cautiously. As a result, scientists continue to disagree over it.</p>

Samangooei, M, Schrodtt, F, Sharmina, M, Toney, J, Walsh, C, Walsh, T, Wood, R, Wood, P and Worsfold, NT (2021) Mainstreaming climate education in higher education institutions. Glasgow: COP26 Universities Network Working Paper.

⁷ "IPCC (2021) *Climate Change 2021: The Physical Science Basis Summary for Policymakers* Geneva: IPCC. IPCC (2022a) *Climate Change 2022. Mitigation of Climate Change. In Change, WGICTTS AROTIPOC (ed.). UNEP; WMO. Geneva: IPCC. IPCC (2022b) IPCC outreach material. Available at: www.Ipcc.Ch/Outreach-Material"/*

⁸ "British Educational Research Association (BERA) (2021) *A manifesto for education for environmental sustainability. Available at: www.Bera.Ac.Uk/News/Manifesto-For-EducationFor-Environmental-Sustainability-Efes-Published-By-Bera-Research-Commission (accessed 21 March 2022)"*

Using images to initiate discussions on climate change and sustainability education.	To comprehend the shift in global temperatures since the late 1800s, use the "climate stripes".
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Major Findings: The following have been found out from the present study-

- Climate change education is of great importance in the context of sustainability.
- Teachers have a positive attitude regarding the importance of climate change education for sustainability.
- The science teachers do not differ from the Arts teachers in regard to their views on the importance of climate education in the context of sustainability
- There exists no significant difference between the rural teachers and the urban teachers in respect of their views regarding the importance of climate change education.

Conclusion:

Therefore, one of the most important ways for national governments to guarantee and show their adherence to international and national frameworks pertaining to human rights, education, the environment, and sustainable development is to improve the education sector's response to climate change. In addition to being a requirement of the UNFCCC, improving climate responses via education would enable national governments to support the MDGs and Education for All (EFA) by guaranteeing inclusive and high-quality education.

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