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Climate Literacy in the Age of Global Climate Change: A Critical Inquiry into Shaping Climate - Literate Society for a Sustainable Future

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Abstract: Climate Change is a multidimensional challenge in the twenty-first century. The challenges venting out of the consequences of climate change are mainly due to a lack of information and knowledge to combat it. It is important to build a climate-literate society to address and combat the consequences of ecological catastrophe. There is a need for cutting-edge knowledge on understanding the nuances of critical components of climate science, which is the need of the hour. Henceforth, climate literacy is an understanding of anthropogenic impact driven by human activities that have led to planetary crisis; cultivating ecological skills and thought processes, with a pragmatic vision of providing a tool to build a sustainable world in the era of climate change world. The role of educators and academic institutions in nurturing environmental stewardship becomes a vital for taking a step forward to a sustainable future in the cocoon of sustainable development goals. This paper will explore and address the vision of cultivating climate literacy as a framework for sustainable development and addressing climate resilience in the age of global climate change. The aim of the study is to identify the efficacy of Climate Change Education (CCE) initiatives and to trace few of the best practices and methods for developing a climate-literate society. As we introspect into the future outcome of the present study, it will envision climate literate society and decision-making processes at individual, institutional, and governmental levels for promoting sustainability and millennium development goals. Thus, it calls for action, emphasising the urgency of humanising climate literacy to empower current and future generations to contribute meaningfully to the global environmental sustainability and resilience effort.

Keywords: Climate literacy, Sustainable development, Climate education, Climate awareness, Global Climate Change

1. Introduction

"Climate Change" is a multidisciplinary subject tailored by several inter-disciplinary studies to recognize the uniform accepted knowledge and create an awareness ecosystem for creating a sustainable future and saving the planet from the crisis. A uniform definition proposed describes, Climate Change as a significant variation in the climate for a longer period of time, resulting in extreme climatic effects such as rise in temperature (land and ocean,) sea level rise, melting of glaciers, resulting to the ecological crisis on the planet earth for the past two decades, (UNFCC, 2007, IPCC 2007). According to World Meteorological Organisation, climate variability and climate change have a significant impact on every facet of society; hence, sustainable development relies on the ability to monitor the extremities of climate conditions and its affect over the years and decades. One of the European research entitled Eurobarometer Survey (2008) highlights that the concern issue of global warming/climate change which gripples the world as the most or the second most problem across all the socio- demographic contexts. Though, climate change is a global greatest crisis, it has solutions and can be solved, p. 22).

Anthropogenic climate change has triggered extensive and swift alterations in the atmosphere, ocean, cryosphere, and biosphere. These changes have influenced numerous weather and climate extremes worldwide, resulting in widespread adverse impacts and consequential losses and damages to both nature and human populations across various regions. Interestingly, human-induced climate change has been a primary contributor to the global rise in the earth's temperature since the mid-20th century, (IPCC, ch.2 2019). This problematic situation calls for a sense of responsibility and awareness amongst people to consider their carbon footprint. It compels society



to reconsider consumption habits, energy sources, and policy decisions to shrink the human effect on the environment. Besides, it also stimulates us to get well versed in the scientific literature and create an effortless knowledge store for all people to mitigate the consequences of anthropogenic activities resulting in the global climate crisis. The study intends to bring behavioural change amongst people in mitigating climate change through climate literate society.

Education plays a foundation in the establishment of a climate-literate society and sustainable development. Environmental education often emphasizes the urgent need for attitude and behaviour change to address environmental problems but tends to overlook teaching students to appreciate the inherent value of nature (Kopina, 2014). "An ecology of environmental education allows for new avenues of inquiry into educational techniques, methods of teaching socio-ecological system as an integral part of ecological learning sphere (Tidball and Krasny 2011). Previous studies have shown that academic and educational interventions have greater impact in understanding tangible factors such as sustainable development and climate change as they empower individuals' behaviour to make immediate changes within their communities (Anderson, 2012).

Climate Literacy is an understanding of anthropogenic impact driven by human activities that have led to planetary crisis; cultivating ecological skills and thought processes, with a pragmatic vision of providing a tool to build a sustainable world in the era of climate change world. The notion of climate literacy was formulated by the National Oceanic and Atmospheric Administration) in 2007 by replacing climate science literacy.

Conversely, climate science literacy entails an awareness based on the accumulation of facts and figures about Earth's Climate system and its dynamic reciprocal relationship between individuals, society and the climate, (USGCRP, 2009). Sustainability Education Coach, Julie Johnston outlined the fundamental concept of climate literacy as: Climate literacy is about acquiring knowledge in the field of climate change studies to profoundly combat its effects, and draw mitigation plans. The objective of climate change education underlies an individual has understanding of the fundamental notion of climate and the science of climate change; that agencies and organizations can construct informed decisions laid out in various reports, thus resulting in modification of behavioural changes to a degree that we are not causing the climate crisis on planet. In other words, Climate literacy is a way of understanding critical global climatic risks, creating an ecological awareness ecosystem, to inform the people and adapt climate resilient adaptation strategies.

Education plays a foundation in the establishment of a climate-literate society and sustainable development. According to UNESCO report, the importance of education is to create a global population that is conscious of and concerned about the environment and its related issues, and that possesses the knowledge, skills, attitudes, motivations, and commitment to work both individually and collectively work toward solutions for existing problems and prevention of new crises. A literate global population is essential for catalysing and engaging individual across the globe to address the complex and interconnected challenges posed by climate change. Furthermore, climate change literacy prioritization would lay the groundwork for a sustainable future that depends on the collective understanding and engagement of individuals across the globe. As we are observing the world, the various reactions of climate change are catering to environmental damages; there is an urgency for public understanding of climate change. The objective of the climate crisis is not merely related to awareness of climate change; it is also about bringing transformational change in society. UN calls for incorporating climate change education, emphasizing on climate change education as we move into the climate-changed world. (United Nations, 2021)

UNESCO's Climate Change Education for Sustainable Development program emerges as a pivotal initiative. In direction, to enhance climate literacy, particularly among young people, it recognizes the prerequisite need to foster young generation equipped with the knowledge and awareness needed to confront and mitigate the impacts of global warming. This commitment signifies a proactive step towards building a more environmentally conscious and sustainable future. UNESCO's first goal is to help people understand the impact of global warming in the present age and hence acknowledge the immediate and existent consequences of climate change. The second one envisions increasing "climate literacy" among young people while recognizing the significance of early education in shaping younger generations' future roles and behaviours.

Researchers mention that the necessity to look for educational beyond its primary emphasis, which is on transforming individual behaviour and to recommend conceptual framework for environmental education (Tidball



and Krasny, 2011). *In his foreword, Ecological Literacy – Educating our Children for a Sustainable World David Orr critiques "We need to work for a broader transformation of the content, methodology, and scope of education at all levels. While stressing on this goal, he stated differently, the ecological issue is fundamentally an educational catastrophe, (Stone 2005).

And he writes: *Ecological literate person would have at least basic comprehension of ecology, human ecology, and the concept of sustainability as well as the wherewithal to solve problems.....and in our time the great questions how we live in the light of the ecological fact that we are bound together in the community of life, one and indivisible, (Stone 2005).*

2. Contextualizing Roots of Climate Literacy

An American educator David W. Orr and physicist Fritjof Capra were the first to coin the term eco literacy in 1995 as a vital tool to an educational paradigm and fostering sustainable living. He founded the Centre for Eco Literacy, non-profit organization dedicated to education for sustainable living. This centre solely advocates his vision to foster education for the sustainability of people and the planet. As quoted by (Capra,1997) in his book, he wistfully implies the role of ecological literacy in the creation of sustainable humanity communities.

"We can learn from societies that have lived sustainably for centuries. We can also model communities after nature's ecosystems, which are sustainable communities of plants, animals, and microorganisms. Since the outstanding characteristic of the biosphere is its inherent ability to sustain life, a sustainable human community must be designed in such a manner that its technologies and social institutions honour, support, and cooperate with nature's inherent ability to sustain life" (Capra,1997).

To guide the earth system away from a potential threshold and stabilise it in a habitable interglacial-like state, collaborative human intervention is vital. This kind of action entails guardianship of the whole earth system—biosphere, climate, and societies—and could involve global economic decarbonisation, biosphere carbon sink enhancement, behavioural changes, technology advances, new governance arrangements, and transformed social values (Steffen et al, 2018).

In Seeds of Change - UNESCO 2023 State of the Education Report for India on Education to address Climate Change, it clearly investigates the significant role of education on combating education especially in India and other parts of the world. Education must reach its maximum effectiveness in shaping a future population that knows the seriousness of this critical crisis and is equipped with the ability to confront it. The emphasis is on climate change literacy as a research priority in the environmental humanities scholarship that connects with the need to stabilize the earth's climate and achieve sustainable development goals by 2025. Likewise, another (UNESCO, 2022) report states over half of the 100 countries examined have barely any mention of climate change in their national education curriculum. One of its GEM report says 62% of countries lack particular national-level Climate Change Education (CCE) policies, laws and plans. Thus, it is indeed quintessential for addressing the need for behavioural change in society and across the globe.

Through fostering climate literacy, we empower individuals to critically assess information, discern the complexities of climate science, and navigate the discourse surrounding climate policies. In an era marked by the increasing intersection of environmental, economic, and social challenges, climate change literacy becomes a catalyst for informed citizenship and responsible global stewardship. While climate change literacy is advocated as a crucial step towards stabilizing the Earth's climate by 2025, it is essential to recognize the substantial divide in perceptions at the county level. The stark contrast between urban and rural areas, particularly in the stance of elected representatives, introduces a significant challenge to the effectiveness of widespread climate literacy programs. (Tiffany and Ayala, 2023).

In this comprehensive review, researchers conducted a study to grasp effective strategies in climate change education, recognizing the growing interest and necessity for impactful climate change literacy as a model for raising awareness. The authors also mentioned that how we approach studying climate change in the context of environmental issues is quite different. (Monroe, et al., 2017).



Climate Change communication and education are an important tool for individuals to understand and confront the effects of climate change. It seeks to foster awareness, beliefs and behaviour that will help progress collective climate action. Studies have revealed that mitigating the climate crisis and its catastrophic implications needs global collaborative efforts from all of us. Nevertheless, it is an uphill task, and also a crucial requirement for achieving sustainable development, the comprehensive adoption of climate literacy initiatives, thereby must not limit their impact at a global scale" (Steffen et al., 2018), (United Nations, 2021), (United Nations, 2015).

In their recent work, researchers have offered harsh critiques of the ultimate collapse of the Paris Agreement. Essentially scholars argue:

"If the Paris Accord target of a 1.5 °C to 2.0 °C rise in temperature is met, we cannot exclude the risk that a cascade of feedbacks could push the Earth System irreversibly onto a "Hothouse Earth" pathway. The challenge that humanity faces is to create a "Stabilized Earth" pathway that steers the Earth System away from its current trajectory toward the threshold beyond which is Hothouse Earth." (Steffen et al., 2018)

Human perception of threats to well-being and the evaluation of probabilities and consequences are solely determined by technical or objective factors. Instead, they are co-determined by a complex interplay of subjective elements such as values, attitudes, social influences, and cultural identity (Ortwin Renn, 2011). What he argues is that if we try to amplify the policy framework of climate change, we need to magnify the human experience of risk and threat as a multifaceted process and its subjective factors rooted in an individual's values, attitudes, social context, and cultural identity. The recognition of climate change learning is essentially important for developing effective climate change communication, strategies, policies, and interventions that resonate with diverse perspectives and experiences.

Remarkably, scholars have argued about empowering the public discourse on the importance of climate education. It is also pertinent to identify eco-literacy to understand the essential principles of climate literacy. In the realm of climate education, eco-literacy refers to providing individuals with the knowledge, skills, and mind-set required navigating and contributing to a sustainable and resilient future in the face of climate problems. It encourages individuals to become knowledgeable and active participants in attempts to combat climate change and safeguard the planet's ecological integrity. Climate literacy, as such, become one of the genres of eco-literacy that interconnects the two sub-disciplinary studies of climate change education. (McBride et.al, 2013, Mc Gown 2013).

3. Importance of Climate Literacy in Addressing Global Challenges

In a climate-changed world, the core understanding of climate science becomes more crucial as and when we are moving towards the challenging scenario of catastrophe. These planetary crises are alarming signs for us to make us aware of the situation, where we need more of adequate knowledge to mitigate ecological issues. According to (Pew Research Centre, 2015), it states that a majority of the population on the globe agree that climate change is a critical problem. The study mentions, a median of 54% believe it to be a very severe problem, while a full 85% believe it to be at least moderately significant (Stokes, et al., 2015). The pressing nature of the matter becomes evident through the recent appeals for strategies to enhance "climate literacy." Climate literacy is essentially crucial for informed decision-making, as it empowers individuals to comprehend the reciprocal relationship between climate and society. A climate literate person grasps the fundamental principles governing Earth's climate patterns, possesses the skills to discern reliable climate information, and effectively communicates about climate change, fostering a more informed and engaged global community.

As argued by Alexander Panos, "When we don't have a literacy level around climate change, we do not have a literate public in terms of climate change impact. The effects of climate change will continue to be and continue to compound upon those who are most vulnerable in our communities—no matter how deep those communities' understanding of climate change is" (Engasser, 2021).

In this article, she discusses how literacy educators can guide students through the study of climate change and how the literacy field can take an active role in addressing climate justice. It also analyses the current approaches to climate change education based on individual behaviour change and scientific literacy. Highlighting the significant role of educators, she mentions the need how to teach and assist students in interpreting internet material on climate



challenges, emphasizing the importance of collaborating to acquire greater insight into understanding of climate crisis.

The findings mentioned in this study highlight that individuals who feel well educated about climate change take far more action than those who feel insufficiently informed about the climate change. Tomáš Milěř and Petr Sládek argue that the public's understanding of climate change is becoming increasingly disconnected from what the scientific community knows about it. Numerous surveys have shown that there is an immediate need to raise climate literacy, which is now at a critically low level. It is what we think that greater efforts should be made to promote climate literacy, (Milěř and Sládek 2010).

The European Parliament commissioned the survey titled *Europeans' Attitudes Toward Climate Change* (Climate Change, 2008). The survey also revealed, "Climate Literacy" is crucial and without climate education, climate policy framework is unavoidable. Even if humanity fails to stabilize climate, climate literacy would be urgently needed for adaptation.

Respondents cited a lack of information as one of the primary causes for not taking action on climate change. The European Parliament commissioned the survey titled *Europeans' Attitudes Toward Climate Change*. The survey also revealed, "Climate literacy" is crucial and without climate education, climate policy framework is unavoidable. Even if humanity fails to stabilize climate, climate literacy would be urgently needed for adaptation.

According to study published in the European Journal of Sustainable Development, it presents that Indian respondents show alarmingly low awareness levels regarding India's response to climate change, as highlighted by the lack of knowledge about the INDC submission and the National Action Plan on Climate Change, which calls the need for robust and widespread educational campaigns. The survey indicated the fact that more than 70% of respondents are not aware of India's Intended Nationally Determined Contributions (INDC) submission under the Paris Agreement and over 50% are not aware of India's flagship "National Action Plan on Climate Change (NAPCC)", (Singh and Mathur, et. al 2019). On the other side, the Lancet's study, states that climate anxiety and eco-anxiety are the major causes amongst people especially youth to deal with the climate change around them. This survey was conducted in ten countries for more than half of 10000 people between the ages of 16 and 25 and revealed that they are still in a state of despair, wrath, shame, and anxiety about what and how to deal with climate change since they don't know how to deal with it (Hickman et. al, 2021). As a result, these findings have far-reaching implications for implementing ecological awareness for society and future generations.

The world fails to incorporate climate literacy even if it is the urgent requirement of the hour. Another article launched an effective argument on how implementing Climate Change Education in the midst of global climate catastrophe would accelerate sustainability in lives. The following article reports on new research from Education International that shows that countries around the world are not prioritising climate education, a fundamental component for a sustainable future.

One of the International Educational Secretary powerfully states, "Climate Change education is not optional, it is vital for the students to cope the present crisis, hone their knowledge and skills to navigate the crisis and bring positive effective change as their lives are impacted and depended on it,(2021).

David Edwards argues, "*Climate Change education is not optional, it is vital for the students to cope the present crisis, hone their knowledge and skills to navigate the crisis and bring positive effective change as their lives are impacted and depended on it.* Notably, other researchers have argued that climate change education literacy is a necessity and that focusing solely on climate literacy will establish and improve fundamental knowledge of climate change, emphasise the need to improve public comprehension of human impact on climate and the reciprocal influence of climate on humanity overall (David Edwards, 2021).

They have stressed widely on imparting the foundational knowledge on understanding key concepts such as the greenhouse effect, atmospheric processes, and the role of oceans and ecosystems in climate regulation (Harker–Schuch, 2022). This would help individuals be better prepared to navigate the complexities of anthropogenic climate change. Furthermore, he quotes that when individuals have a clear grasp of the physical science principles, they are better positioned to view climate change as a systemic challenge rather than an abstract or nebulous threat. The Paris Agreement's vision and the principal goals of sustainability are closely linked to climate literacy in the context of the environmental crisis. The educational pursuit of climate literacy shares common ground with environmental



science education while presenting a parallel avenue for fostering awareness and understanding of the intricate relationships between human activities and the environment.

"Human capacity is the most important variable that determines whether our country can address the challenge of climate change and achieve sustainable development". – Prof. Ephraim Kamuntu, Minister of Water and Environment of Uganda.

4. Challenges and Barriers to Climate Literacy

The UNCC have emphasized the crucial need for climate change education to achieve the Sustainable Development Goals (SDGs) and the objectives of the Paris Agreement. As we advocate for climate literacy, it is imperative to address and bridge these regional disparities in perceptions. While ignoring the rural-urban divide, it may lead to resistance and hinder the comprehensive adoption of climate literacy initiatives, thus limiting their impact on a national or global scale. To achieve effective climate change mitigation, it is crucial to develop strategies that consider and accommodate the diverse perspectives and interests of both urban and rural communities. Recently at COP 28 event held from November 30 to December 12, 2023, in Dubai, UNESCO highlighted its active engagement in advancing climate change education. The organization seeks to enhance political commitment toward greening education by sharing best practices and solutions in climate change education. The ultimate goals fostering synergies for action in greening schools, developing curricula, teacher capacity building educational systems and communities. Through these efforts, UNESCO aims to contribute significantly to addressing climate change challenges and promoting sustainable education practices on the global stage.

To integrate climate education in schools and educational institutions, UNESCO is currently establishing "Green School" quality standard and greening curricular advice. This is, in addition to its ongoing work on Education for Sustainable Development (ESD) and responsibilities as secretariat of the Greening Education Partnership, which has 81 nations and over 1,100 organizations on board. Until now, 126 countries have made promises to combat climate change through education.

"In the coming decades, the survival of humanity will depend on our ecological literacy and our ability to understand the basic principles of ecology and live accordingly. This implies that Eco literacy must become a critical skill for politicians, business leaders, and professionals in all fields, and it should be the most important component of education at all levels - from primary and secondary schools to colleges, universities, and professional continuing education and training" (Capra, 1997).

David Orr argued, "The failure to develop ecological literacy is a sin of omission and of commission. Our educational shortcomings extend beyond neglecting fundamental knowledge about the Earth; they involve the propagation of misinformation. By omitting ecological perspectives across subjects, we perpetuate the misconception that ecology is irrelevant to critical aspects such as history, politics, economics, and society. This not only hampers a comprehensive understanding of the world but also impedes informed decision-making for a sustainable future, (Orr, 1992). While another ecologist, Capra argues that ecological literacy should be the most important component of education at all levels, from primary and secondary schools to colleges, universities, and professional continuing education and training. On the Furthermore, sustainable development begins with eco literacy, followed by ecological design, which necessitates applying our ecological knowledge to the essential revamp of our technologies and social institutions, to bridge the existing gap between human engineering and the ecologically sustainable structures of nature. In his book *"The web of life: a new scientific understanding of living systems"*, Capra outlines:

"Sustainability, then, is not an individual property but a property of an entire web of relationships. It always involves a whole community. This is the profound lesson we need to learn from nature. The way to sustain life is to build and nurture community." (Capra, 1997)

Educators argue that teaching climate literacy at academic and institutional levels indeed, is a matter of big challenge. However, it is important to recognize and address these challenges in order to train our young generation and engage them to respond to the climate catastrophically age. For this, Institutions must prioritize climate literacy, adopt innovative teaching methods, and foster a collaborative learning environment that transcends various interdisciplinary methods to effectively prepare students. Nonetheless, teaching learners how to mitigate climate crisis, it would guide learners to understand the concept of climate change's adverse effects while we would also empower



them to come up with creative ideas to deal the associated fear and anxiety erupting out of changing climatic environment. It is pertinent to note that scientific data and technological advancements guide us only if we have completely acquired uniformity on a similar concept of understanding. Thus, the rise of understanding of climate literacy becomes more crucial and more significant if we want to comprehend the causes, consequences, and solutions, which would empower individuals, to not only adopt sustainable practices but also willingly reduce carbon footprints.

5. Critiques of Climate Change and Climate Literacy

Although not all the scientists or educators think alike, and it has become common fashion to dismiss the discussion of climate change on the forum or off the forum. A handful of climatologists believed that there is no global warming, no anthropogenic climate change as it is a mere planetary change, which takes place at certain billions of years. Some of the scientists and professors who have publicly opposed climate change education are in view of climate change denial. As per latest data approx. 1917 scientists signed the World Climate Declaration, disapproving of the phenomena of Climate Change including Nobel laureates. Guus Berkhout, a retired geophysicist who co-founded the "Climate Intelligence" group claims in his World Climate Declaration document that there is no climate emergency. The declaration also highlights a few more climate realists, which keeps changing though (Clintel, 2024 & Perry 2019). John F. Clauser, a Nobel Prize-winner in physicist who has no expertise in climate science yet has expressed scepticism about the reliability of climate models and the role of CO₂ in warming the planet. Ivar Giaever, Nobel Prize-winning physicist who possesses no background in climate science quotes in his tweet, "*Climate science is said to have degenerated into a discussion based on beliefs, not on sound self-critical science*". As per the reports published in (Quint, 2022) and Inside (Climate News, 2022), it brings to forefront that other group eminent scientists do not believe climate change is real or there is any climate emergency. Viv Forbes, a former geologist and administrator of a climate sceptic blog and the executive director of a climate sceptic organization. He has argued that climate change is natural and beneficial and that climate education is "brainwashing" children (Perry, 2019). These are just a few to cite who disagree on climate catastrophe and on contradictory vision related to disastrous futures under the term "doomist or pessimism." Different scholars have claimed that that we need to distinguish between climate doomists and climate realists to envision climate crisis subjects to measure the strengths and weaknesses. Their views are often influenced by ideological, political, or financial intents that tend to spread misinformation and confusion. To analyse and study these sceptics' views, we may approach alternative models such as insightful discussion, climate fiction, and agitation.

"*Education for Sustainable Development*", UNESCO report publication sheds light how human behaviour are the prime cause for driving the climate change emergency and the subsequent environment sustainability crisis. It has indeed altered the planet's geological function to such an extent that the survival of each species is now threatened. On the contrary, this change is irreversible each day and therefore, we must learn to live in a diverse manner, (UNESCO, 2020).

6. Models for propagating Climate Change Education

There is a need for pioneering knowledge on understanding the nuances of critical components of climate science, which is also crucial for creating an ecosystem of climate literacy. This would bring all the people from different professions to work on the same boat of sustainable development across the board. Based on the theory of eco-literacy, we can derive the essential need of climate literacy for constructing critical and contemporary ecological skills and knowledge for everyone including politicians, business leaders, and professionals in all fields. The following model can be seen as a conceptual framework to foster climate literacy.

7. David Orr's Notion of Ecological Intelligence

Climate Literacy is a dynamic pragmatic process of the cognitive learning process based on the importance of prior knowledge in constructing new understanding and nuances of global environmental issues. The educational pursuit of climate literacy shares common ground with environmental science education while presenting a parallel avenue for fostering awareness and understanding of the intricate relationships between human activities and the



environment. One of the first approaches to the present holistic concept of climate literacy, as cited by Marek Oziewicz, was Orr's instruction on ecological design intelligence, which opens the topic as in sociocultural competency and multidisciplinary learning (Oziewicz 2014).

Orr's theory of ecological intelligence is extremely useful to draw the attention towards creating climate literate society. With the growing environmental challenges and the complexities between human activities and the natural world, there is a pressing need to address what David Orr aptly terms as the "disorder in thought." There is a lack of understanding of ecological concepts, and the scientific terms of climate change, which poses a significant obstacle to sustainable development, and the harmonious coexistence of humanity with the environment (Orr, 2004).

Orr stated for a transformative approach to education, which goes beyond traditional paradigms to instil what he terms as "ecological design intelligence." This ecological intelligence encompasses the capacity to comprehend the intricate ecological systems that shape our existence, an ability to recognize and respect environmental limits, and skill in accurately gauging the scale of our actions about the broader context of the planet.

As David Orr's notion of the "**ecological design intelligence**" advocates for a paradigm shift in education as a means to counter the disorder in thought. He claims that such education has requisite aptitude for directing the complexity of human-induced activities to foster a harmonious relationship between human societies and the Earth's ecosystems. The environmental educator propagates climate literacy as an integral component of enhancing ecological knowledge for all. He acknowledges offering a holistic framework, which should extend beyond the conventional boundaries of academic disciplines. He advocates for the inclusion of bio-philial, the disciplinary structure of knowledge, the architecture of educational buildings, and organising the curriculum for the prospects of life and the environment. Thus, this form of education will become a model in recalibrating human functional role in dealing with ecological crisis.

He argues ecological intelligence will call for an integral module of education design, which can recognise and respect the optimal use of natural resources, limit the carbon footprint and make a stand for a green and sustainable future. It will also empower individuals to understand the finite nature of resources, the climate of ecosystems, and sustainable ways to dominate delicate ecological balance without harming the environment.

The essence of Orr's argument is— ecological intelligence is the fundamental method in shaping the ideas and philosophies about our relationship with the earth but also lets us explore the impacts of technological advancements as a barrier to sustainability. This century is preferably driven by climate change and thus it demands for higher-level ecological thinking to solve such global problem.

8. A Glance: Impact of the United Nations Institute on Promoting Climate Literacy

The United Nations Climate Classroom (UNCC) is one of the joint initiative by collaborating with 30 multilateral organizations and it is hosted by the United Nations Institute for Training and Research (UNITAR). UNCC sole initiatives is to foster climate literacy, which is defined as *"the understanding of climate change and its impacts, as well as the skills and motivation to take informed and responsible action"*. The Climate Classroom during COP events provides an opportunity for participants to learn from experts, exchange views, and network with other stakeholders in a dynamic and interactive setting. These Climate Classroom lessons provides an opportunity to participants to learn from experts, exchange views, and network with other stakeholders in a dynamic and interactive setting. It shares a platform for formal and informal learning about climate science learnings at all levels. Subsequently, UNCC seeks to promote critical climate awareness, help in capacity building and inspire creativity among individuals and organisations to meet the problems while offering accessible, relevant, and high-quality learning tools and opportunities. One of the main activities of the UNCC is the Climate Classroom is a series of 45-minute learning sessions on key climate change issues, held during the annual Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC, 2007). Through its initiatives, they have so far, 5320 participants and delivered over 83 Climate classes in collaboration with 20 UN organisation. Additionally, they have also propagating climate change learning different programs in 30 countries, which benefited over 860,000 beneficiaries. Previously, UNESCO propagated climate literacy program to the young learners through its innovative educational initiatives, such as Global Action Programme, Action for Climate Empowerment during COP 22 event. Likewise, World Meteorological Organisation (WMO) is also committed to educate, motivate and engage in forming



climate school networking, (United Nations, 2021). According to United Nation Climate Change (UN CC) learning programs surveys conducted to gather impact results from learning community as well as those beneficiaries who gave their testimonials projected the objective of understanding the effectiveness of the climate change courses conducted on online platform. These are the main findings from the year 2023:

- a) 94% of respondents claimed to have gained the information and skills needed to take climate action from the UN CC:Learn course.
- b) 93% of respondents are confident talking up or supporting causes related to climate change after taking a course.
- c) 75% of respondents who have changed the way they think about the climate change completely.
- d) 40% respondents participated in climate policy discussions as local, national and global level.
- e) 82% respondents applied the knowledge and skills.

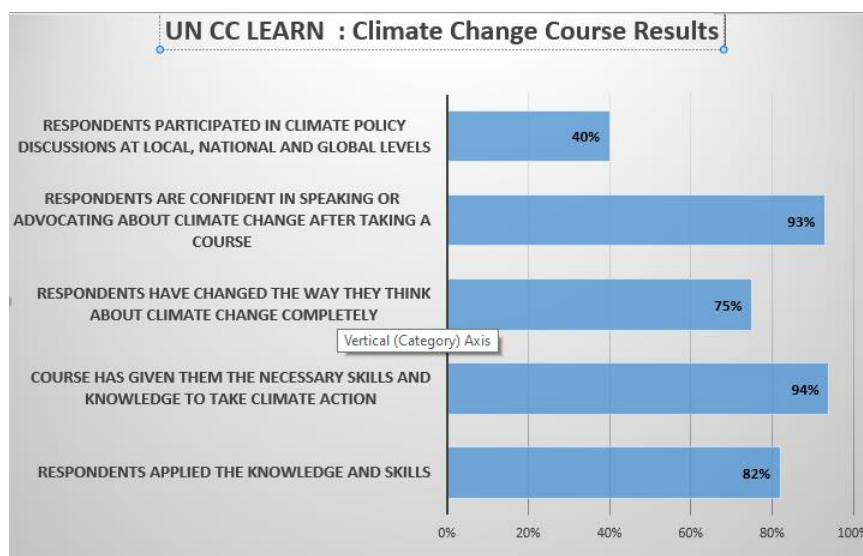


Figure 1 UN Climate Change Learning Impact Results: 2023.

9. Conclusion

In the age of globalisation, "Climate change" raises severe threats to the planet, environment, economy, and society. An enormous lack of awareness perpetuates a status quo where unsustainable practices may continue unchallenged. It is imperative to educate the public about the urgency of climate action and crucial role of citizen that they can play in fostering sustainability. Climate literacy, indeed paves the way for accelerating critical thinking, developing ecological insights, probing behavioural development for preserving the planet from the ecological crisis. For instance, whether it is implying Orr's ecological intelligence or the UNESCO Climate Classroom lessons, these would be transformational change in thinking about the rapidly changing global climate.

Certainly, the climate change era is dominated by the chaotic impacts of the climate crisis and climate anxiety, and climate literacy emerges as a crucial and transformative tool. In the pursuit of aiming for a sustainable future, improved climate legislation and bringing a green lifestyle shift are symbiotic. Nonetheless, legislation provides the framework but individual actions amplify its impact. However, the magnitude of awareness and inclusion of the misinformation paradox poses a challenge that demands a nuanced approach to climate communication. Additionally, acknowledging the potential for apathy and actively addressing climate literacy barriers, we may cultivate a pool of climate literate society and thus, this will empower them to play an active role in building a sustainable future. Ultimately, the path to sustainability requires a harmonious integration of legal frameworks, individual actions, and a collective commitment to transformative change. The future research scholarship needs to focus on bridging and collaborating different education networks for creating "climate schools".

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