

# Building competencies amongst youth to mainstream knowledge and soft skills to enable a transformative impact on the society

TARU MEHTA, \*LIVLEEN K KAHLON, MONMI BARUA,  
Environment Education and Awareness,  
The Energy & Resources Institute (TERI)  
6C, Darbari Seth Block, India Habitat Centre, Lodhi Road, New Delhi,  
INDIA

\* Corresponding author

**Abstract:** - The world is recognizing the relevance and scope of Sustainability Science (SS) as it integrates the disciplines ranging from pure sciences and social sciences and their specializations. Hence, a balance between policies, research, and direct action is integral to the field of SS. Interdisciplinarity is important for SS, and this is a relatively new area. Hence, experiments done within the scope of SS need to be recorded and intensive dissemination of lessons learnt (Haider, 2018). The youth of today should be aware of these new upcoming disciplines and be able to align their strengths to address environmental challenges with interdisciplinary skills. The future belongs to the youth, and they will also be impacted the most. Representative of vibrance and positive energies, young people are our future citizenry. The need of the hour is to enhance their knowledge of sustainability and improve their skill sets. This is achievable only when the capacity-building initiatives are planned with the right mix of pedagogy, limiting not only to subject matter knowledge but beyond, hence touching the sphere of SS. At TERI (The Energy and Resources Institute), different permutations and combinations are tried to make learning creative and, at the same time, have the potential to apply learning in a larger setting. This paper presents the findings of a project run by TERI in partnership with NCSTC (National Council for Science and Technology Communication), Department of Science and Technology, Government of India. TERI implemented TERI-NCSTC Eco Next Investigation for Youth, which comprised six trainings of five days each on local environmental issues. Along with core environmental learning, these workshops were also enriched with science communication and leadership training. Post this training; a few selected students worked on action projects that promised a transformative impact in their immediate neighborhoods. Through the program, TERI directly reached out to 175 students and also influenced 20 students to implement path-breaking changes in their surroundings. The program helped students enhance their knowledge about issues related to nature conservation, eco-restoration, and nature-based solutions through tools that stressed co-creation, leadership skills, innovative approaches, and experimentation. The paper also stresses upon future research area on citizen science concept and ways in which a connect could be established with environmental education.

**Key-Words:** - Action Projects, Capacity Building, Environment Education, Education for Sustainable Development, Leadership, Science Communication, Soft Skills, Youth Development

Received: June 18, 2022. Revised: August 29, 2023. Accepted: September 24, 2023. Published: October 31, 2023.

## 1 Introduction

Youth is an important target group for spreading awareness about environmental protection and sustainable development. They can channel innovative ideas into experiences of joyful learning and constructive action. Youth is hence considered as a resource and a catalyst for strengthening transformative impact on society. It has been realized that opportunities for convergence between a sustainability agenda and core ESD (Education for Sustainable Development) practices, enthuse youth to pursue a path of ecopreneurship.

There is another important aspect related to youth and sustainability. As per the reports from UNESCAP, young people will play a crucial role in achieving the Sustainable Development Goals (SDGs) by 2030. It is a fact that a majority of the world's young people live in Asia and the Pacific. Global reports point out that youth action will be the key to the achievement of six SDGs: Zero Hunger, Quality Education, Gender Equality, Decent Work and Economic Growth, Reduced Inequalities, and Climate Action (Hwang, 2017). It is evident that creating opportunities for youth to move out of poverty into decent and sustainable work will help

capitalize on the demographic dividend created by the youthful population of a region.

Ecopreneurship is a term coined to represent the process of principles of entrepreneurship being applied to create businesses that solve environmental problems or operate sustainably. The term began to be widely used in the 1990s, and it is otherwise referred to as "environmental entrepreneurship." The term was first introduced in the book *Merging Economic and Environmental Concerns through Ecopreneurship*, written by Gwyn Schuyler in 1998.

It has been estimated that the population of young people between 15 and 24 years of age accounts for 15.5 percent of the global population. It has also been suggested that the youth cohort will reach 1.29 billion (15.1 percent of the world total) by 2030 and almost 1.34 billion (13.8 percent of the overall population) by 2050 (Tina P. Kruse, 2020). International Telecommunication Union's, estimated that young people are the driving force of connectivity, with 75 per cent of the 15-24 year old now online, compared with 65 per cent among the rest of the population. (Measuring Digital Developments: Facts and Figures, 2022). Youth are the ones who will bear the brunt of all environmental challenges and at the same time also hold important decision making positions in times to come.

However, while engaging youth in finding solutions for the world's problems, one often forgets that they are not just an avenue to think out-of-the box but an important stakeholder that requires adequate skilling opportunities. To reaffirm these attributes and help individuals transition to an empowered and responsible global citizenry, different permutations and combinations are tried at TERI to make learning creative and applicable to larger settings. With this background, The Energy and Resources Institute (TERI), under the partnership with the National Council for Science and Technology Communication (NCSTC), Department of Science and Technology, Government of India, implemented Eco Eureka Training as part of Eco Next Investigation for Youth program. This prestigious program was driven by Science, Technology, and Communication skills centered upon transdisciplinary knowledge of critical domains like eco-media, eco-design, eco-innovation & eco-cultures. Primarily, the belief was to prepare youth in a manner so that they are equipped to act as role models capable of making informed choices and

decisions. Majorly, the initiatives focus on promoting youth volunteerism and responsiveness for building regenerative ecological futures (Pamposh Kumar, 2019).

The project was implemented in the cities of Delhi, Bengaluru, and Panjim, where two batches of Eco Eureka training were held from September 2018 – August 2019. The program was able to train 175 youth from the said locations and also from nearby districts and less endowed regions around the targeted cities. Out of these, 17 students were selected as Eco Eureka Fellows to implement their project ideas within their college neighborhoods. Through their efforts, they reached out to the communities and touched the lives of approximately 10,000 beneficiaries, comprising of students, community members, etc.

## 2 Tools and Techniques

The true purpose of science education does not rest on science as a guiding principle for environment protection and sustainability but on equipping the learner with the confidence to embark on a journey of self-discovery and leadership that reflects the relevance of peer-to-peer learning and an eternal harmony with nature. Successful delivery of science education is based on selection of practices both from ontological and epistemological perspectives. Further, as demonstrated by the current case study, an evolving understanding of sustainability-linked issues over the course of the training supports the phenomenographic pedagogical method (Feifei Han, 2019).

The case study offers a classic case demonstrating technique relevant to youth research, including participatory research, action research, community-based participatory research, and arts-based research. The research design offered is highly dynamic in approach, and the training allows practical, hands-on experimentation of the learnings. Several permutations and combinations around examples of youth research methods have been adopted for the execution of the training. These are a mix of traditional methods (FGD, interviews, questionnaires, observations); visual and digital methods; methods where youth construct data; creative methods (Skits, drama, games, and activities); and task-based methods (drawings, diagrams, worksheets, photographs) (Susan Tilley, 2018).

### 3 Methodology

Skilling youth is an irreplaceable component of the socio-economic development of a country, particularly those with a growing young population like India. The Government of India has adopted skill development as a national priority and is expected to be a key driver to giving momentum to the economy. The current academic orientation should also encompass skilling from a young age so that the employability skills of the youth can be enhanced (Arora, 2019)

The entire program was run through a set of dynamic tools referred to as Eco Eureka training. This set of 65-day trainings focused on enhancing knowledge on environmental issues, promoting science communication, and supporting leadership skills amongst young students. Apart from these, an element of media literacy was incorporated wherein participants were trained to promote these and related issues through media to generate public awareness.

Throughout the training, a practical approach was adopted by providing hands-on training in measuring several parameters on technical know-how, adaptability, learning agility, communication, and leadership skills. As part of the workshop, students were encouraged to explore nature-based solutions and adopt a nature-friendly attitude.

The paper adopts a case study approach, which is deployed to understand in-depth, multi-faceted explorations of ways and means of education in real-life settings. This approach is particularly useful to employ when there is a need to understand the processes involved and challenges encountered in a given context. Our aim in writing this piece is to provide insights into intertwining sustainability science concepts with pure sciences and social science.

### 4 TERI's approach

Science and technology (S & T) have profoundly influenced the course of human civilization. S & T is the critical driver necessary for development and social transformation. It can make an invaluable contribution to growth, for example, reducing disease burdens and food insecurity, facilitating communication, enabling monitoring of global and national environments to minimize conflicts, giving an early warning of natural disasters, and developing new ways of using water, energy, and other natural resources. S & T is essential for the

holistic development of youth and related communities. Additionally, India is set to become the most significant contributor to the global workforce. According to The Environment Scan 2016, (KPMG, 2016), a projection of requirement of 103 million skilled manpower by the time period of 2017-2022 is made.

Job markets are transitioning with each passing day; today, skills that employers seem to emphasize while screening candidates are domain knowledge, adaptability to the environment, learning agility, and positive attitude (India Skills Report, 2020).

Against the above background and realizing the importance of working with the demographic dividend of India, The Energy and Resources Institute (TERI) implemented TERI- NCSTC Eco Next Investigation for Youth from 2018 – 19, which was catalyzed and supported by the National Council for Science & Technology, Department of Science and Technology, Government of India. The program strived to create a cadre of youth who are aware, innovative, and ready to make a difference for nature conservation, eco-restoration, nature-based solutions, co-creation, and innovation. The project considered science necessary to mitigate and solve present and emerging environmental problems. However, the specific objectives were as follows:

- To provide a platform for the youth to learn concepts on nature conservation, eco-restoration, nature-based solutions, co-creation, and innovation.
- To hone leadership skills in youth, this will subsequently enable them to transform knowledge into action
- To instill a sense of responsibility and engage youth in environmental stewardship to play a proactive role in addressing issues related to sustainable development
- To encourage use of media as a means of reaching out to the masses

The program focused on three fundamental principles: imparting knowledge, building skills and competencies, and enabling action to reiterate the learnings imparted during the capacity-building programs. TERI designed the workshops to cover various aspects of the environment by discussing live projects and successful case studies.

The program provided the participants with an opportunity to undertake research projects through

fellowship programs, which paved the way to enabling action at the grassroots level.

The Eco Eureka Training was organized to provide students with technical and environmental knowledge and skills to deal with the issues in their day-to-day lives. While the National Council for Science and Technology Communication (NCSTC) delved into making science communication the basis to reach out, TERI believed that it was critical to augment the training by interweaving lessons of leadership, project management, and team building. Lessons further elaborated science communication on methods, information and technology tools, and options for publishing the stories of change to build up further students' capacity to use the lessons learned while implementing their ideas on the ground. Such neo-liberal methodology is adopted owing to the gap in the curriculum, which is remotely addressed in school systems. With growing demands in the labor market for technical expertise infused with soft skills, this approach helps students build their portfolios for job markets.

Eco Eureka training was organized in two batches in Delhi, Bengaluru, and Panjim. A total of six training on the subject provided a vital locale-specific approach to harness the youth's attention towards a solution inclined ideology. University students across the streams in all these locations were targeted. All issues covered revolved around three pillars of sustainable development - environmental, social, and economic and had deep-rooted connections with achieving the targets of SDGs. Out of 17 SDGs, training focused on developing capacity of students on education for sustainable development (ESD-SDG 4.7), water, sanitation and hygiene (SDG 6), renewable energy with emphasis on biofuels (SDG 7), urban planning (SDG 11), waste management (SDG 12, 13), climate change and environment sustainability (SDG 14, 15).

The two aspects of the training, developing core competency and augmenting soft skills, solved real-time challenges and helped them bring core technical aspects at the forefront of project implementation. As a follow up, TERI awarded the Eco Eureka Fellowship 2018-19 to 17 students. As a fellow, students implemented a project that they felt passionate about and which catered to immediate needs in their vicinity against seed funding catalyzed and supported by the National Council for Science & Technology Communication (NCSTC), Department of Science & Technology (DST), Government of India. Enlisting two projects out of

the 17 implemented that vividly describe the adoption of technical and soft components to achieve the objectives of the fellowship.

- a. The Composting Project by Ms. Arveen Kaur Sodhi from the University of Delhi: As the name suggests, the project was implemented to set up a compost pit to reduce the kitchen waste from the cafeteria of a college hostel and to strive towards achieving behavioral change amongst peers and people working in the hostel mess. Delhi has one of the highest annual generation of waste. Hence, the student team felt a necessity to include a capacity-building program on Waste Management. Activities were clubbed with Do-It-Yourself (DIY) projects that can solve local issues.

This type of direct action project supports the theory behind neoliberalism and the attraction that it holds for the youth, as they continuously strive for uniqueness and novelty of approach (Henn, 2017).

The most crucial aspect of The Composting Project was to set up a model for composting in an institutional setup like a college and at a low cost. The team identified a resource person who undertook a round of capacity-building initiatives of making a decentralized compost unit using earthen pots at home. The program was replicated at the hostel campus to deal with more significant amount of waste generated. Lessons on communications and media delivered during Eco Eureka Trainings helped her design strategies to reach out to the masses on awareness generation. In contrast, leadership and project management helped her implement the projects following management cycles.

- b. Rain Water Harvesting in College Campus by Esha Gadekar from Dnyanprassarak Mandal's College and Research Centre, Assagao, Goa: With her college located at a plateau hill, spread across 30 acres, the campus received an ample amount of rain due to its tropical location. Apart from surface runoff, a lot of rainwater was unutilized, which fell on the roofs of the buildings. The main highlight, in this case, was using the roof water to recharge the groundwater and set up a replicable and demonstrative model for awareness generation. This pilot project on Rain Water Harvesting helped create awareness among peers.

TERI's experts have been aiming to develop solutions for providing equitable access to clean and safe water while ensuring social, environmental, and economic sustainability in water resource allocation. Through the project, students were taught ways to conserve water, by emphasizing the topography of the region.

## 5 Outcomes

Eco Eureka training was an ambitious program as this was for the very first time we were simultaneously training students from different academic streams- Science, Arts, and Commerce. The platform presented a unique experience of not only interweaving soft skills with technical expertise but also helping in paving the road that the students face while experimenting on the ground. Some of the immediate outputs that were gained are as follows:

- Trained 175 students on key thematic areas- ecosystems, waste management, water management, sustainable agriculture, green building, and renewable energy technologies.
- Trained 175 students on leadership, project management, communication, and team building
- Involved 60 experts through active interactions with participants.
- Engaged youth through intensive interaction spread over 30 days (approximately 240 hours.)
- Mentored 17 project teams, where the outcomes rippled to approximately 10,000 people comprising students and communities.

The initiative opened doors to deep dive into environmental research. It helped students see the issues in totality, both from the view of science and society, thus making the deliverables inclusive. The program helped bring creativity to students and enlarge the scope of science education. The long-term impact of integrating interdisciplinary knowledge is to trigger their interest in STEAM learning and develop their aspirations and employability through STEAM (Hsiao P-W, 2021) and simultaneously adapt to or solve the most pressing issues humanity faces.

## 6 Conclusion

The level at which youth entrepreneurs in India innovate is the highest in the Asia and the Pacific region, as per a report by Global Entrepreneurship Monitor (GEM) and Youth Co: Lab. Around 55% of

Total Early-stage Entrepreneurial Activity (TEA) showed innovation-orientation for entering new markets or introducing new products, services, or processes unique to the market (Ulrike Guelich, 2019). Interestingly, only Australia's young entrepreneurs had a similar level of innovation orientation among the nine countries, as studied by the GEM consortium. Innovation is a core driver of economic and business growth and job creation and must be one of the main areas for new policies on youth entrepreneurship. The findings of this report suggest that access to higher education leads to better entrepreneurial attitudes and greater entrepreneurial intentions, perception of skills, and perception of entrepreneurial opportunities.

Over the last few years, the start-up ecosystem in India has strengthened considerably across the value chain, thereby providing them an opportunity to innovate and offer products and services that are new and unique for their consumers. The influxes of capital from private equity and venture capital funds in Indian start-ups prove the growth of the start-up ecosystem (Ulrike Guelich, 2019).

Parallely, the pool of talents and skills required from fresh graduates and young professionals is unprecedented because the demographic dividend is enormous; there is competitiveness amongst the achievers, and the job markets are changing with new automation that is driving the economy. There is an utmost need to teach the attitude of unlearning, learning, and relearning to adapt to the changing work environment.

Given the global trends, Sustainability is a critical pathway that should be a way of life for youth. Programs like Eco-Eureka training should be taken up extensively so that youth from all walks of life benefit from similar co-learning opportunities. In addition, knowledge, attitude, and practice are three pillars supporting behavioral change, while locale-specific variables control an individual's specific actions. Understanding this in context with youth-based education competencies, opportunities, and motivation levels influences learning levels, which catalyze behavioral changes. It is conceivable that, students who are educated to be active learners since childhood can transform into an active citizenry that participates in activities towards achieving sustainable development. Another area that needs sound and knowledgeable investment is the field of 'citizen science'. Currently, a significant gap in the environmental scenario is the citizen science disconnects and lack of awareness on environmental

issues. Students and youth should inculcate a greater understanding of the gravity of the climate and ecological situation in the region. Curriculum tools like hands-on learning, contribution to scientific measurements, data collection, and mapping efforts should be employed. Public participation in scientific research (PPSR), will support innovative environmental solutions, and youth need to work as harbingers of change in this direction.

Documentation and promotion of ideas similar to this project will ensure that youth are involved in environment improvement initiatives by making it:

- Relatable to their immediate environment
- Interesting and hands-on
- Exciting and inviting by introducing incentives

#### References:

- [1]. Haider, L. H.-S. (2018). *The undisciplined journey: early career perspectives in sustainability science*. Sustain Science 13.
- [2]. Kim, S. H. (2017). *UN and SDGs: A Handbook for Youth*. UNESCAP.
- [3]. Tina P. Kruse, W. N. (2020). *World Youth Report*. New York: United Nations.
- [4]. (2022). *Measuring Digital Developments: Facts and Figures*. International Telecommunication Union.
- [5]. Pamposh Kumar, D. A. (2019). *Communicating S&T for Regenerative Ecological Futures*. New Delhi: Department of Science and Technology, GoI.
- [6]. Feifei Han, R. A. (2019). Using Phenomenography to Tackle Key Challenges in Science Education. *Frontiers in Psychology*.
- [7]. Susan Tilley, L. T. (2018). *Qualitative Methods and Respectful Praxis: Researching With*. The Qualitative Report.
- [8]. Rajni Arora, M. C. (2019). Analysing the impact of skill India as a tool for reshaping Indian. *International Journal of Research and Analytical Reviews-Vol 6*.
- [9]. KPMG. (2016). *Environmental Scan*.
- [10]. NSDC. (2020). *India Skills Report*. Taggd.
- [11]. Henn, J. H. (2017). Neoliberalism and the Unfolding Patterns of Young People's Political Engagement and Political Participation in Contemporary Britain. *Societies*.
- [12]. Hsiao P-W, S. C.-H. (2021). A Study on the Impact of STEAM Education for Sustainable Development Courses and Its Effects on Student Motivation and Learning. *Sustainability 13*, no. 7: 3772.
- [13]. Ulrike Guelich, N. B. (2019). *Youth Entrepreneurship in Asia and the Pacific*. UNDP and Global Entrepreneurship Monitor.

- Transform into innovations and ideas that will improve livelihood

The avenues mentioned above provide a clear direction to stakeholders for future research.

#### Acknowledgements:

We extend our heartfelt gratitude to the National Council for Science and Technology Communication, Department of Science and Technology, Government of India, for financial support and Dr Pamposh Kumar, Scientist F, DST, for mentoring during the program. We are thankful to TERI for allowing us to implement the program and acknowledge all the colleagues, researchers, trainers, and students who participated in this project.

#### Contribution of Individual Authors to the Creation of a Scientific Article

Ms Taru Mehta laid out the overall design and structure of the program. She is responsible for drafting of manuscript.

Dr Livleen K Kahlon was the technical advisor of the program. She undertook the literature synthesis for the paper.

Ms Monmi Barua, implemented the project deliverables and facilitated stakeholder interaction and mobilization

#### Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

National Council for Science and Technology Communication, Department of Science and Technology, Government of India

#### Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

#### Creative Commons Attribution License 4.0 (Attribution 4.0 International, CC BY 4.0)

This article is published under the terms of the Creative Commons Attribution License 4.0

[https://creativecommons.org/licenses/by/4.0/deed.en\\_US](https://creativecommons.org/licenses/by/4.0/deed.en_US)