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ROLE OF HIGHER EDUCATION FOR INCULCATION OF ENVIRONMENTAL LITERACY AMONG THE STUDENTS

Amalendu Pal [1] & Mintu Halder [2]

RESEARCH ARTICLE

Author Details:
[1] Adjunct Faculty,
J. C. Bose University of Science & Technology, YMCA,
Faridabad, India;
[2] Former Principal,
George College,
Department of Education,
Kolkata, West Bengal, India

Corresponding Author:
Mintu Halder

Abstract

Environmental literacy refers to the ability of individuals to understand the natural world, the impact of human activities on the environment, and the skills to make well-versed decisions to mitigate environmental problems. It also includes individual's knowledge, awareness, and hands-on experience. In this regard, higher education institutions (HEIs) play a vital role in promoting environmental literacy by educating students about environmental issues, critical thinking, fostering sustainable practices, and encouraging active participation in the solutions of environmental problems. As higher education shapes future leaders and professionals of various fields, so assessing the role of higher education in promoting environmental literacy has becomes imperative. By integrating environmental concepts across disciplines, providing hands-on learning experiences, making scope for research and innovations, and organising outreach programs, universities can equip students with the knowledge, skills, and motivation to become environmentally responsible citizens and leaders. This paper explores the multifaceted role of HEIs in fostering environmental literacy, examining curricular integration, pedagogical strategies, institutional practices, and student engagement. It argues that a transformative approach to education is essential to prepare environmentally conscious citizens capable of addressing global ecological challenges. The objectives of the present study are to identify the components environmental literacy at the higher education level, to analyse the impact of experiential learning for the development of environmental literacy at higher education level, to study the role of research and innovation organised by the higher education institutions for environmental literacy, and to analyse the nature of community engagement and outreach programme organized by higher education institutions. The methodology of this paper is documentary based analysis. Authentic data have been collected from books, journals, magazines, newspapers and internet sources. The data used in this study are secondary in nature; logical analysis has been made on the perspective of qualitative method.

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Introduction

The concept of environmental literacy has its roots in the environmental movement of the 1960s and 1970s. Charles Roth coined the term environmental literacy in 1968, emphasizing the need for environmental education to promote environmental awareness and stewardship. Direct responses to global environmental crises can slow the tide of environmental degradation. Higher education institutions are uniquely positioned to play a pivotal role in this process. They serve as hubs of knowledge creation and dissemination, and they influence the values, behaviour, and professional practices of students in regard to environmental literacy. By embedding environmental literacy into the curriculum, the HEIs can equip students with the skills and attitudes required to make informed decisions that support environmental sustainability.

The maintenance of sustainable environment requires a coherent endeavour with a predetermined plan of action on the part of all pro-active human beings including the HEIs and their students (Dixit, 2024. The basic objectives of the environmental literacy are to manoeuvre the power of education to create a healthier and more sustainable environment for future generation. In addition, environmental literacy program is to be transferred into a movement across the globe, and programme of action ought to be at the centre of this movement. The importance of such movement lies in its potential to foster a culture of sustainability, promote environmental awareness, and inspire action to protect the planet.

With intensifying global threats such as deforestation, climate change, resource depletion, loss of biodiversity and increasing pollution, societies are in dire need of well-informed citizens and leaders capable of making environmentally responsible

decisions. Colleges and universities possess the unique power to nurture this consciousness, guiding students to understand the intricate relationships between human activity and the environment (Shri, Usha and Tiwari, 2021).

Universities and colleges are more than just academic institutions; they are hubs of innovation, leadership development, and social responsibility. They are incubators of ecological awareness, values of sustainability, and action oriented thinking. By integrating environmental education into their curricula, they empower students to think critically about their role in protecting sustainability of the environment. Promotion of environmental literacy is not just an academic endeavour – it is a societal imperative. Through experiential learning, campus sustainability initiatives, interdisciplinary research and innovation, and public outreach programs, students develop not only knowledge but a lifelong commitment to environmental well-being.

By embedding sustainability concepts into courses across disciplines - from engineering to literature - universities cultivate a holistic understanding that goes beyond the classroom, encouraging students to think critically, act ethically, and lead sustainably. As a catalyst for cultural and behavioral change, HEIs must recognize its moral and civic responsibility in shaping environmentally literate graduates.

Literature Review

The world and its environments are changing rapidly, and the public may have difficulty in keeping up and understanding how these changes will affect our way of life. Many countries of the world have developed Environmental Literacy Programme for inculcating awareness in the minds of their citizens.

The term environmental literacy was first used 45 years ago in an issue of the Massachusetts Audubon (1968) by Charles E. Roth who inquired ‘‘How shall we know the environmentally literate citizen?’’ Since then, the meaning of the term has developed and has been extensively reviewed (Roth 1992, Simmons 1995, Morrone et al. 2001, North American Association for Environmental Education (NAAEE, 2004).

In 1977, UNESCO proposed five characteristics of “environmental literacy,” which include: (1) awareness and sensitivity to the overall environment; (2) understanding and experience of environmental issues; (3) possessing values and feelings for the environment; (4) possessing the skills needed to identify and solve environmental problems; and (5) the ability and willingness to participate at all levels to solve environmental problems.

Concept of Environmental Literacy

The notion of environmental literacy has been and continues to be promoted through creative and intensive discourse from a diversity of perspectives. The most widely accepted meaning of environmental literacy is that it comprises an awareness of and concern about the environment and its associated problems, as well as the knowledge, skills, and motivations to work toward solutions of current problems and the prevention of new ones (NAAEE 2025).

Charles E. Roth defines environmental literacy as “*A person’s environmental sensitivity, knowledge, skills, attitudes, values, personal investment, responsibility, and active involvement*”. He refines the term later by subsuming environmental sensitivity, attitudes, and values under the term “affect”. Fang, Hassan & LePage, (2023) in their book *The Living Environmental Education* has commented that this modification is important because attitudes and values are shaped by societal norms and values. However, what society deems to be important at any point of time is really a reflection of the people’s perception of environmental issues, their sensitivity towards these issues, and how they should be managed.

Based on the above discussion, the definition of environmental literacy may be stated as a 2person’s comprehension, knowledge, and awareness of environmental concerns, including their causes, effects, and potential remedies. In other words, environmental literacy inspires a person to make educated judgments and perform responsible activities that contribute to environmental sustainability and global well-being. Advancement of environmental education and literacy depend on the roles of governments, educational institutions, and social groups through policy, curriculum, and community engagement.

Discussion on the Objective: 1

Identification of the components environmental literacy at the higher education level: In the quest for the components the environmental literacy, we may refer to UNESCO Tbilisi Intergovernmental Conference, as important event resulting in identifying widely recognised and applied conception of categories of objectives of environmental education: awareness, knowledge, affect, skills, and participation. Its significance cannot be ignored (Marušić, 2020).

The Hungerford & Peyton Model explains environmental literacy beyond knowledge alone, emphasizing a continuum that leads to responsible environmental behaviour. The framework identifies environmental literacy as a holistic construct where knowledge, affect, and behaviour interact to produce environmentally responsible citizens. It generally encompasses knowledge and understanding, affective domain (attitudes and values), cognitive skills and abilities, and environmentally responsible behaviours. The components are explained thus:

1. **Knowledge and Understanding** – Understanding ecological principles and human - environment interactions.
2. **Affective Disposition (Attitudes and Values)** – Developing concern for environmental protection and sustainability.
3. **Cognitive Skills and Abilities –** Acquiring the ability to analyse, evaluate, and solve environmental problems.
4. **Environmentally Responsible Behaviors i.e., Participative Behaviour** – Engaging in responsible actions and practices for environmental protection.

However, the components mentioned above are, in a sense, work together to empower individuals to make rational decisions to save sustainability of environment (Marušić, 2020).

Knowledgeand Understanding: An environmentally literate individual possesses comprehensive knowledge of a wide array of ecological knowledge, environmental problems, and their potential solutions. It also stands for the development of awareness of environmental challenges, like climate change, pollution or loss of biodiversity etc. Alongside, the ability to apply the knowledge of potential solutions and sustainability practices are also required for the actualization of knowledge. Ecological concepts stand for general understandings about ecosystems and ecosystem management (Kaufmann et al., 1994). In this article a systematic framework is made through which ecosystems may be defined and ecological needs can be evaluated and incorporated into the decision making process.

The concepts of climate change, pollution and loss of biodiversity together known as Triple Planetary Crisis. Each of these issues mentioned here are required to be resolved to have a viable future environment on this planet. United Nations Climate Change (2022) has mentioned in a press release about the lack of awareness about the Triple Planetary Crisis on the part of people at large.

Affective Disposition: Affective dispositions are organically related with environmental literacy. It denotes attitudes, values, and motivations that foster care for the environment and empathy for other living beings and future generations (Orhan, (2022). A change in the values, beliefs, attitudes and mind-set of people in conformity with protection of sustainable environment requires deep rooted knowledge and education of environment.

An affective disposition is defined as the state of having a tendency to do something (Oxford English Dictionary, 1989). In this regard, affective dispositions can be put in plain words as affective reactions that individuals display towards environmental deterioration (Hines, Hungerford, and Tomera, 2010; Kals and Maes, 2002; Kollmuss and Agyeman, 2002).

The component of affective disposition includes sub-dimensions in itself (Roth, 1992). These are personal responsibility and self-control. The aspects such as intention to take action, sensitivity towards the environment, eagerness, attitude, world-view, self-efficiency, self-control and motivation are defined as variables involved in affective dispositions (Hollweg et al. 2011).

Schultz et al. (2004) defines the environmental attitude as beliefs that have an impact on individuals' behavioral intentions regarding the activities related to environment. Therefore, changing people's attitudes and behaviors towards the natural environment can be seen as an important component for the solution for environmental problems (Keniger et al., 2013; Steg et al., 2014). Students are expected not only to be able to protect the environment but also solve the environmental problems (Fua et al., 2018) with the help of positive environmental attitude.

Some studies showed a strong relationship between environmental attitudes and environmental-friendly behaviors (Poortinga et al., 2004; Abun et al. 2019). Therefore, studying environmental attitudes is important because they may determine behaviors (Gifford and Sussman, 2012). There are many factors such as gender, educational background, age, and income which significantly impact individuals' environmental attitudes (Blocker and Eckberg, 1989; Mohai, 1992; Marquart-Pyatt, 2008.).

Cognitive Skills and Abilities: Cognitive skills are the brain's functions for thinking, paying attention, processing information, and remembering things. They constantly aid thought processes and memory retention. Therefore, Cognitive skills are essential for developing a strong foundation in environmental literacy.

Cognitive skills as a component of environmental literacy (Napitupulu et al.2025) help us in critical thinking and problem solving related to environmental challenges, ability to analyze data critically, evaluate sources of information and solve problems, communicate skills to discuss and advocate for environmental issues, etc. Cognitive skills and abilities are required to interpret and respond to environmental problems. Individuals with strong cognitive skills are more likely to evaluate information from various sources and take judicious decisions about environmental issues. Therefore, environmental literacy is critical in shaping a generation that can maintain ecosystem equilibrium and address global environmental challenges.

Learning activities that involve direct interaction with environmental issues encourage students to comprehend real-world problems and their solutions. Education also cultivates environmental awareness and pro-environmental behaviour from an early age (Nath, 2024). Therefore, education can create a generation with high environmental literacy ready to face global environmental challenges.

Environmentally Responsible Behaviors i.e., Participative Behaviour: Human behaviour is a thoughtful act with certain objective and purpose in mind. Thus, environmental behaviour refers to well directed human response to the solution of environmental problem. It is an individual behaviour that contribute or not contributing to the sustainability of the environment (Abun, 2017).

It has been recognized that human beings are responsible for all kinds of environmental problems. We are responsible for aggravating environmental problems. It has been stated that the environmental literacy is a skill which is applied in transforming environmental knowledge into responsible behaviours about the environment (Morrone, Mancl and Carr, 2001). Disinger and Roth (1992) have stated that an individual, along with a comprehensive environmental knowledge, should be able to use responsible environmental behaviour, belief, view and attitudes in determination and prevention of the environmental problems. Behaviour toward environment can be classified as pro-environmental behaviour and anti-environmental behaviour. Pro-environmental behaviour refers to behaviours that contribute to environmental sustainability such as conservation of energy, avoiding waste, recycling, avoiding activities that are harmful to the environment, creating new solutions to avoid environmental

problems such as renewable energy, embracing green technology, and environmental activism (Mesmer-Magnus et al., 2013). These behaviours can be seen when people are minimizing the use of their air condition in their offices and rooms, taking public transportation when they go to office, and participating in actions that are related with the protection of the sustainability of environment. Thoughtful deliberate activities on the part of human being certainly act as pace setter of participative behaviour (Corral-Verdugo, et. al., 2003).

From this discussion, it may be said that

- Ability and willingness to apply knowledge, skills and attitudes and values into concrete actions that benefit the environment.
- Participating in environmental stewardship and advocacy will be game changer.
- Making lifestyle choices lead the way to reduce environmental degradation.

Most importantly, environmental literacy equips individuals with the tools needed to apply their knowledge and understanding effectively in various environmental contexts.

However, these four components work together, allowing individuals not only to understand environmental issues, but also to actively protect and improve in creating a more sustainable world.

Discussion on the Objective: 2

Analysis of the impact of experiential learning for the development of environmental literacy at higher education level: Our planet has been confronted with serious environmental problems. Textbooks and academic lectures can present concepts of environmental literacy (Levitt, 2025) but they rarely evoke enduring environmental consciousness necessary for genuine change. This is where experiential learning becomes significant. By involving students directly with the natural environment, theoretical ideas turn into perceptible experiences, which results into the development of personal dedication to stewardship. The aim is to convert theoretical idea of environment into practical, actionable skills and profound personal bonds with nature.

David Kolb is the proponent of the concept of experiential learning. Hands-on-learning can be a form of experiential learning. According to Kolb, learning is a process that involves our experiences, reflections, and ability to utilize what we have learned in new situations.

Experiential learning is the process whereby knowledge is created through the transformation of experience (Kolb, 1984). Kolb describes the process of experiential learning as cyclical, with four phases: concrete experience, reflective observation, abstract conceptualization, and active experimentation. The cycle begins with a concrete experience followed by reflection on that experience. Therefore, reflection is critical to experiential learning. In other words, reflective activities need to be purposefully designed and implemented to foster learning from an experience (Dyngeland, 2025). Based on reflections, assimilation of the information is required to form positive and dynamic action plan. Kolb's theory of experiential learning is also called learning by doing. Experience, prior knowledge, and new knowledge together inspire the learners to initiate additional actions.

Neuroscience research (Dubinsky and Hamid, 2024) indicates that practical activities engage various regions of the brain, enhancing memory, critical thinking, and problem-solving skills. Experiential learning promotes a deeper comprehension, enhanced retention, and improved capacity to use knowledge in different situations by connecting abstract ideas to concrete experiences.

Therefore, the theoretical concept of experiential learning is to be used to enables students to engage directly with real-world environmental issues rather than just studying theory in the classroom.

Various strategies have been used by the HEIs for the development of personal dedication to stewardship in the minds of its students through experiential and hands-on learning.

1. **Learning beyond the Classroom:** Unlike lectures or textbook learning, field studies provide direct, hands-on experiences. In the light of this concept, the HEIs are moving beyond the traditional lectures by engaging them in fieldwork in forests, rivers, wetlands etc. Apart from this, they are provided with training to assess urban ecosystems, environmental monitoring and collection of data on climate change etc.
2. **Campus as a Living Laboratory:** HEIs in India have been trying to build their campus for the benefit of environmental literacy. The idea of "Campus as a Living Lab" (CLL) (Stuckrath et al. 2025; Favaloro, Ball and Lipschutz, 2019; Nayagam, 2025; Amrita Vishwa Vidyapitham) model and experiential learning projects are being used to foster environmental literacy. In accordance with this idea, universities are now making their campus as avenues of experiential learning and involving students in energy audits, biodiversity mapping and many hands-on projects related to campus ecology or sustainability challenges.
3. **Internships and Community Engagement:** Curriculum of the HEIs now includes thoughtful responses to environmental issues (Williams et al., 2008). Based on the notion of community as core, a model of environmental sustainability education, which reflects experiential learning, has been introduced in various universities. Various environmental NGOs, government agencies, and green industries have been trying to reach the remote areas of our society and explaining the people through seminar, exhibition, role play, drawing competition, poster competition, etc. on environment related matters to upgrade the awareness about the danger of environmental degradation.

4. **Project-Based and Service Learning:** Project-Based learning presents pertinent and effective learning of environment for the students that provides hands-on, practical, and interesting possibilities of environmental literacy (Yolcu, 2023). Students are encouraged to take up projects that address environmental challenges like creating eco-friendly campus solutions. Service-learning combines academics with community service, instilling values of civic responsibility and environmental stewardship.

   There are various initiatives of the government of India under the Ministry of Environment, Forest and Climate Change, such as Environment Education Programme (EEP), National Environment Awareness Campaign (NEAC), and National Green Crops etc. The target is to provide to the children and the youth with nature-based experiences and hands-on activities. HEIs are trying to translate the above mentioned initiatives through action oriented programmes.
5. **Simulation and Role Playing:** Role playing is a useful technique for developing a broad understanding of a situation or approach, and to prepare one for different eventualities (Rumore et al., 2016). Some examples are as follows; environmental policy simulations, climate negotiation role-plays, disaster preparedness drills etc. These activities simulate real-world decision-making and help students experience the complexities of environmental governance and ethics.
6. **Research-Based Learning**: Its aim is to develop the attitude of the students through experiential learning conducive with the protection of sustainability of the environment. No doubt, students' participation in research can enhance environmental knowledge and critical thinking, and assessment ability about the impact of experiential learning opportunities such as fieldwork, internships, and project-based learning. No doubt, active involvement in research can significantly influence the behaviour of the students of HEIs. Some of the examples are – experiments both in laboratory and natural settings, analysis of pollution levels, soil health, carbon footprints etc.

Discussion on the Objective: 3

Role of research and innovation organised by the higher education institutions for environmental literacy: Research and Innovation in higher education are fundamental to enhancing environmental literacy (Restović and Bulic. 2024). It contributes to environmental literacy in various ways, among them scientific discoveries through which universities conduct cutting-edge research on climate change, biodiversity conservation, pollution control, and renewable energy, equipping students with evidence-based understanding of environmental issues, etc. Such as;

i. **Advancing Scientific Understanding of Environmental Issues:** Higher education institutions conduct research that deepens our understanding of key environmental problems, such as, climate change and global warming, Pollution (air, water, and soil), biodiversity loss and ecosystem degradation, sustainable agriculture and water management, etc. These types of researches enhance students' understanding of environmental literacy (Lee, 2025).
ii. **Developing Innovative Technologies:** Colleges and universities foster innovation through the development of clean and renewable energy technologies viz. solar, wind, bio-energy, green building materials and sustainable construction practices, advanced water purification and waste management systems, smart agriculture techniques and climate-resilient crops. Such innovations not only offer practical solutions to environmental problems but also expose students to real-world applications of sustainability.
iii. **Research-Based Curriculum and Teaching:** Academic research is integrated into teaching, ensuring that students are exposed to the latest developments and data in environmental science and policy.
iv. **Interdisciplinary and Collaborative Research:** Environmental challenges require collaborative solutions (Francis et al., 2018). Universities encourage interdisciplinary research that combines natural sciences with social sciences, engineering with economics and policy studies, technology with ethics and law. This approach provides students with a well-rounded understanding of environmental literacy and fosters creative and multifaceted solutions.
v. **Policy Encouragement:** Research outputs from higher education institutions often serve as the basis for environmental policies at local, national, and global levels. Scholars and experts provide guidance, white papers, and policy briefs that influence decision-making and public awareness.
vi. **Student Involvement in Research:** By engaging students in research projects, institutions nurture curiosity and critical thinking in their mind. Students contribute to data collection, experiments, and fieldwork, learning to apply scientific methods to tackle environmental issues directly.
vii. **Innovation Hubs and Startups:** Many universities now support green startups and sustainability-focused incubators. These platforms encourage students and researchers to turn their ideas into viable businesses or community solutions that promote environmental sustainability.
viii. **Global Research Networks:** Higher education institutions participate in international research collaborations on climate action, environmental justice, and sustainability. These networks share knowledge, methodologies, and innovations across geographical borders, which strengthen global environmental literacy.

Discussion on the Objective: 4

Analysis of the nature of community engagement and outreach programme organized by higher education institutions: Community engagement and outreach programme are powerful tools through which higher education institutions extend their environmental literacy efforts beyond the classroom and campus. The practice of involving and working together with people, organizations or communities to address and accomplish various kinds of social and developmental subjects is referred to as

community engagement. It is a dynamic and interactive approach for the betterment of the whole community. Besides, outreach programme is an activity through which information and support are given directly to the residents of community.

Universities around the world are now adopting multidirectional approach by way of uniting academic programmes and courses with practical and campus-based sustainability projects to bolster the programme of environmental literacy (Environmental Audit Report, 2023-24, Dr. D. Y. Patil Biotechnology and Bioinformatics Institute).

Besides, HEIs are now collaborating with local communities, non-governmental organizations and government institutions like *Zila Parishads, Gram Panchayats*, etc. to put forward the significance of protecting sustainability of the environment at the ground level (Subramanya & Sarker. 2022).

The main objective of the above mentioned activities is to implement practices and strategies to mitigate the negative impacts of human activities on the environment and making literate the community aware about the inevitability of sustainable environment.

1. **Environmental Awareness Campaigns**: HEIs organise programmes like afforestation drives, clean-up drives, water conservation efforts, workshops on waste segregation, energy conservation, and plastic-free living, ecological literacy, climate literacy, (Orr, 1992; McBride, et al, 2013; Tannen and Lincoln. 2025). Earth Day celebrations and many more are organised by involving the students in hands-on experiences, which would cultivate a deeper sense of awareness and responsibility toward environmental challenges. Eco-clubs, organinsed by the students and powered by National Service Scheme (NSS), conduct awareness drives in favour of green India, campaigns against plastic pollution through rallies in local areas, undertakes plantation drives, water conservation, etc.
2. **Collaborations with Local Communities**: HEIs collaborate with rural and urban communities, non-governmental organizations (NGOs), municipal bodies and rural local government institutions. Such partnerships enable students and researchers to co-create solutions to local environmental challenges. Tata Institute of Social Science (TISS) integrates community outreach programs with its curriculum to address climate adaptation and disaster management. Even, adaptability training to face the challenge of natural disaster is also given to the rural residents. It has performed social and community responsibilities during Bhopal gas disaster and Uttarakhand floods. Besides, such collaboration would pave the way for empathy, responsibility, and real-world skills of the residents of community to handle the environmental problems.
3. **Citizen Science and Participatory Research**: HEIs involve the public, eco-club, NGOs in scientific research which is known as citizen science. Programmes like monitoring of water quality, bio-diversity surveys and air pollution tracking, use of eco-friendly colour, utility of bio-gas plant, rain water harvesting, etc. would empower the local citizens with scientific knowledge and enhance their environmental literacy. The TISS organizes training and capacity-building programs for government officials, which include topics relevant to environmental management and sustainability. The Indian Institute of Technology Kargapur, Delhi, Bombay conduct several sustainability initiatives and research in their campus making the campus 'living laboratories' for the students. In this venture, it also includes community members. Azaim Premji University also takes initiatives to promote environmental sustainability through programs like plantation drives under the banner NSS unit of the university. The Subhanti University propagates the idea of Green India through various projects and programs like vermin-composting, rainwater harvesting, and waste recycling, etc. Literacy India, a non-profit organization, offers skill development for sustainable farming techniques and traditional crafts to tribal communities in several states of India.
4. **Policy Advocacy and Social Change**: The Ministry of Environment, Forest and Climate Change has been created in response to environmental research and international commitments. Besides, The Wildlife (Protection) Act, 1972, The Forest (Conservation) Act, 1980, The Environment (Protection) Act, 1986, The National Green Tribunal Act, 2010, etc. are the result of the ongoing research for the protection of sustainability of the environment in India.

   In fact, the movement against the environmentally unsustainable process of development and its impact on the resource rights and livelihoods of the marginalized communities led to the formation of various kinds of environmental protection acts in India.
5. **Extension Programs and Lifelong Learning:** HEIs orgnise various Extension Programs and Lifelong Learning for farmers, workers, and citizens to educate them on organic farming and water-saving irrigation, renewable energy and energy efficiency, use of sustainable resource and environmental rights, technology transfer, enhanced productivity, resource transfer, etc. that promote environmental literacy (Community Outreach and Student Volunteering Initiatives, Report (2023). The Oxford College of Engineering, Bengaluru, has undertaken various extension programs, energy conservation and renewable energy, reduce plastics and save green, water conservation, tree plantation, water conservation programme – *Jal Sakti Abhiyan*, etc. under the *Unnat Bharath* Scheme of the Government of India. The Students of Nature Club of the St. Jopesh's College, Darjeeling, India, has organised seminar on Water crisis in Darjeeling, tree labelling initiatives, etc. to broaden the environmental literacy program.
6. **Campus-Community Projects**: HEIs also organise Campus-Community Projects such as Eco-villages, Community water purification systems, Waste-to-compost initiatives etc. which are no less important in the inculcation process of environmental literacy (Yalçin et al., 2012). The students have been involved in community based environmental projects such as environmental governance, wildlife management, etc. M. G. R. College, Hosur, implements an eco-friendly campus model and collaborate with surrounding local communities to promote environmental awareness beyond campus.

The main focus of the community engagement and outreach programme organised by the HEIs is to merge environmental sciences with social studies, economics, bureaucracy, politics, climate, food, air, water, sanitation and several others to develop a clear idea about the need of sustainable environment through environmental literacy. In so doing, empathy and conscience of the whole society will gradually increase to an optimum point of saving the globe to a large extent.

Challenges

It is imperative to point out the challenges associated with improving environmental literacy in higher education is essential for advancing the role of universities in sustainable environmental education.

The HEIs often encounter barriers such as lack of curricular integration of the environmental themes, limited faculty training in interdisciplinary pedagogy, insufficient institutional commitment, weak links between universities, local communities, industries, and policymakers, lack of practical, problem-solving, or community-based learning and also, varying levels of student engagement with sustainability initiatives. In addition, the absence of comprehensive policy frameworks can hinder the systematic inclusion of the subject of environmental literacy across different programs of study.

The researchers have pointed out several issues that come in the way of smooth inculcation of the concept of environmental literacy among the students.

1. It has been observed (Paswan, P. K., & Mehta, D. 2025) that there are various challenges in the environmental literacy programs viz. curriculum integration and standardization, lack of trained educators, lack of essential resources and infrastructure, financial constraints, balancing local and global environmental issues, cultural and socio-economic barriers, lack of political will and policy support, etc.
2. Smooth operation of environment literacy programmes has been hampered due to the lack of allotment of classes in the time table, lack of organization of environmental activities (Community engagement and outreach activities), burden of pedagogical curriculum, lack of environmental awareness and training among the teachers (Sherpa, K. 2022).
3. Some studies (Puri et al., 2021) showed that the society is not conscious about the impact of eco-systems, injurious impact of environmental pollution and climate change (IPCC, 2023), etc. Alongside, lack of rational outlook and promise towards environment management, paucity of environmental training materials and schedule, lack of rational curriculum and organisational support, etc. come in the way of proper inculcation of environmental literacy.
4. Lack of trained and expert teachers with empathetic attitude towards environmental issues is a challenge (Kumar, N. J. S., and Shobana, N. D., 2024).

Conclusion

It is the urgent need of time to cope up the challenges that come in the way of the improvement of environmental literacy at higher education level. It is required on the part of the HEIs to identify the measures for the enhancement environment literacy among the students. Therefore, actualization of the concept of sustainable environment considerably depends on the role of HEIs. The review of existing literature highlights that literacy profiles vary across disciplines, shaped by prior educational exposure, personal values, and academic orientations. These differences underscore the need for comparative and interdisciplinary approaches to strengthen students' knowledge, attitudes, and behaviors toward environmental issues.

Addressing these challenges require integrative strategies involving curriculum development, professional development opportunities for the faculties, innovative pedagogical practices, students' active participation, and supportive institutional policies. To deal with all these problems, homogeneous approach and meaningful policy framework for environmental literacy module are the urgent need of the time. Besides, cohesive and meaningful community outreach activities, holistic curriculum integration leading to the incorporation of environmental literacy module, and scope of obtaining hands-on learning experiences are to be included across the programmes of higher education. Above all, environmental education should be made compulsory in all undergraduate degree courses.

Such efforts not only augment higher education's commitment to environmental education but also ensure that students are equipped with the knowledge, values, and skills necessary to participate meaningfully in addressing contemporary environmental challenges, contributing to sustainable development, and become informed citizen of this country. Instilling a sense of responsibility towards environment from young age and encouraging sustainable practices and behaviours are to be translated into action.

The ministry of Science & Technology, Environment & Forests is required to more active to translate the idea of environmental literacy by adopting different people friendly strategies. In this regard the recommendations of T.S.R Subramanian Committee Report on Environment are required to be comprehensively implemented. To overcome the financial crisis of environmental literacy, budget allocation is to be increased.

By and large, an empathetic attitude on the part of citizens of our country is required to overcome the problems that come in the way of environmental literacy. Besides, a congenial atmosphere is to be developed to work together to cultivate collective consciousness and awareness across the globe for the protection of environmental sustainability. This possibly will promote a comfortable space and a clean home for all.

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