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Environmental Literacy as a pillar of 21st century Education

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Abstract

Environmental challenges, including climate change, pollution, and resource depletion, demand urgent action and a paradigm shift in human-environment interactions. Environmental literacy, encompassing understanding, appreciation, and appropriate action on environmental issues, is crucial for fostering sustainable societies. India's National Education Policy (NEP) 2020 recognizes the urgency of integrating environmental awareness and sustainability into education at all levels. This article examines how NEP 2020 aims to cultivate environmental literacy through curriculum integration, pedagogical innovations, teacher training, and community engagement. It delves into specific initiatives like Eco Clubs for Mission LiFE, credit-based courses in higher education, and the emphasis on Indian knowledge systems for environmental conservation. The article also addresses the challenges in implementing these reforms, including funding constraints, infrastructure deficiencies, the digital divide, and the need for a comprehensive assessment framework to measure environmental literacy outcomes. Finally, it proposes recommendations for overcoming these hurdles to realize NEP 2020's vision of nurturing environmentally conscious citizens and building a sustainable future.

Keywords*: environment, sustainability, environmental degradation, environmental literacy.*

Introduction

The accelerating pace of environmental degradation presents a profound threat to human well-being and the planet's ecological balance. From global warming and climate change to biodiversity loss, pollution, and resource depletion, these challenges demand immediate attention and concerted efforts across all sectors of society. Education plays a pivotal role in addressing these complex issues by fostering environmental literacy, which empowers individuals to understand, appreciate, and act responsibly towards the environment.

Environmental literacy, as an outcome of environmental education, provides a strong foundation for future environmental responsiveness and facilitates the transition towards more sustainable societies and healthier living. Environmental literacy still poses a challenge that needs to be addressed. Several factors contribute to the low levels of environmental literacy in Indonesia, including inadequate understanding and knowledge of environmental issues such as climate change, pollution, deforestation, and biodiversity (Astuti & Aminatun, 2020). Environmental literacy can be implemented through practical experiences in the real environment, allowing students to see and directly experience the environmental aspects learned in the classroom. For example, through field trips to national parks or botanical gardens, students can witness biodiversity, observe ecosystems firsthand, and understand the importance of environmental preservation for ecosystem sustainability (Gayford & Saveland, 1978). Additionally, through participatory activities in environmental management, such as environmental cleanups, tree planting, or recycling initiatives, students can experience the positive impact of real actions in maintaining environmental cleanliness and preservation (Ernst & Monroe, 2004). This can enhance their awareness of personal responsibility in environmental conservation and motivate them to engage in real actions as environmental advocates. Research shows that practical experiences also help students develop practical skills, such as observation, measurement, and data analysis, which are essential components of environmental literacy (Madden & Liang, 2017). Research suggests that through discussions, research, and analysis, students are encouraged to think critically about the environmental implications of human actions, climate change impacts, habitat degradation, and other relevant issues. They can identify facts, evaluate evidence, and consider various viewpoints before making decisions that impact the environment (Sukma et al., 2020).

India, as a rapidly developing nation, faces significant environmental pressures alongside a burgeoning population and a growing demand for resources. Recognizing this critical need, the National Education Policy (NEP) 2020 lays a strong emphasis on integrating environmental awareness and sustainability principles into the education system from an early age. The policy aims to cultivate a generation of environmentally conscious and responsible citizens who actively contribute to conservation efforts and advocate for sustainable practices. This article explores how NEP 2020 aims to achieve this crucial goal by examining the policy's recommendations, ongoing initiatives, and the challenges and opportunities associated with implementing a comprehensive environmental literacy framework in India.

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NEP 2020 and environmental education: A vision for sustainability

The NEP 2020 underscores the importance of environment education as a key component of a holistic and multidisciplinary learning experience, aiming to nurture eco-consciousness and promote sustainable development and conservation efforts. It envisions environmental education becoming an integral part of school and higher education curricula, community outreach initiatives, and public awareness campaigns.

* Integrating environmental awareness across the curriculum

The policy recommends embedding environmental concepts and concerns across various subjects to facilitate interdisciplinary learning and highlight the relevance of environmental issues. NCERT has already infused environmental themes into existing textbooks across subjects and grades. Projects and activities related to environmental issues provide practical learning experiences. Environmental awareness is integrated into science, social science, and language textbooks.

* Promoting experiential learning and green skills

NEP 2020 emphasizes hands-on activities, field trips, and outdoor education to foster a deeper connection and appreciation for the environment. Experiential learning instills practical skills and promotes stewardship values. The policy also encourages vocational education with a focus on green skills, such as solar energy installation, organic farming, rainwater harvesting, and waste recycling and management.

*Eco clubs for Mission LiFE

A significant initiative is the promotion of "Eco Clubs for Mission LiFE". These clubs encourage student participation in environment-friendly activities aligned with the seven themes of Mission LiFE. More information on this initiative can be found at PIB and PIB.

* Higher education's role in environmental literacy

NEP 2020 recognizes the critical role of higher education institutions (HEIs) in fostering environmental literacy and promoting sustainable development. It suggests that HEIs should include credit-based courses and projects in environmental education, covering topics such as climate change, pollution, waste management, conservation, and sustainable development.

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The policy emphasizes integrating environmental awareness into all B.Ed programs, ensuring that future teachers are equipped to instill environmental consciousness in their students.

The pedagogical shift: Beyond textbooks

NEP 2020 emphasizes a pedagogical shift towards more engaging and effective methods for environmental education.

*Nurturing critical thinking and problem-solving

Environmental education needs to go beyond rote learning and foster critical thinking, problem-solving, and decision-making skills. Activities like research projects, debates, and simulations can help students analyze environmental issues and develop sustainable solutions.

*Leveraging technology for enhanced learning

NEP 2020 recognizes the role of technology in enhancing environmental education. Online platforms, apps, VR, and AR can provide engaging and immersive learning experiences. Digital tools can also facilitate collaboration and participation in scientific research.

*Teacher training and capacity building

Effective environmental education requires well-trained and environmentally aware teachers. The policy acknowledges the need for comprehensive teacher training programs that equip educators with the knowledge, skills, and pedagogical approaches to integrate environmental concepts effectively. This includes training in digital literacy and the ethical use of technology and AI. The National Curriculum Framework for Teacher Education (NCFTE) 2021, currently under development, will guide this process.

Environmental Literacy Education Teaching Effectiveness Evaluation

Through teaching effectiveness evaluation, educators can understand which environmental literacy education methods are effective and which need improvement, thereby optimizing teaching methods and improving teaching quality. This helps to assess students' learning outcomes in environmental literacy education, promptly discover students' knowledge gaps and needs, and provide targeted educational resources. The evaluation index system for the

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teaching effectiveness of environmental literacy education should comprehensively and multi-dimensionally evaluate students' environmental knowledge, skills, attitudes, and behavior. The index system constructed in this study is as follows:

Knowledge mastery:

a) Basic environmental knowledge: Understand basic concepts, principles, and policies and regulations in the environmental field.

b) Interdisciplinary knowledge: Understand geography, biology, chemistry, and other interdisciplinary knowledge related to environmental protection.

c) Environmental problem analysis: Possess the ability to analyze environmental problems and understand the causes and impacts of environmental issues.

Skill development:

a) Environmental protection skills: Master practical environmental protection skills, such as waste sorting, energy-saving emission reduction, and ecological restoration.

b) Problem-solving ability: Possess the ability to analyze, evaluate, and solve environmental protection problems.

c) Team collaboration and communication: Be able to play a role in the team and effectively communicate environmental awareness and perspectives with others.

Attitudes and awareness:

a) Environmental awareness: Possess a high level of environmental awareness, pay attention to environmental issues, and care about our planet.

b) Environmental responsibility: Possess a sense of social responsibility, actively participate in environmental protection activities, and contribute to environmental protection.

c) Self-reflection: Be able to reflect on one's behavior's impact on the environment and actively improve.

Practical behavior:

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a) Environmental behavior: Actively participate in environmental protection actions in daily life, such as resource conservation and low-carbon living.

b) Social participation: Participate in environmental protection organizations and activities, promoting the development of environmental protection causes.

c) Knowledge dissemination: Spread environmental knowledge and concepts to others, raising others' environmental awareness

Challenges and opportunities for implementation

Implementing a robust environmental literacy framework in India presents both challenges and opportunities. At present, the content of the Indian Environmental Education is not much comprehensive and informative for the students. Curriculum framers must not only focus on theoretical aspects of environment to be taught to the learners but also should frame its content giving ample of opportunities to explore the environment by themselves so as to realize the underlying interconnection between humans and environment, various hazardous deeds of humans deteriorating it and the responsibilities we have in taking care of the same. Siddqui & Khan (2015) have suggested that the content must associate the learning with the actual world. It needs to be relevant to the learners and address problems that are significant to the society and should also master learners with the adequate skills in order to continue learning all through the life. Firsthand experience is very much important to be given to the learners wherever and whenever possible because unless they sense the problems by themselves they will not think of coming up and following the solutions for the betterment of environment and lives breathing in it. Therefore, content of environmental education should be practical in nature and encouraging in a way to gear up generations in taking earnest initiatives in improving the degraded status of our environment.

1.Bridging the digital divide

Unequal access to digital infrastructure and devices, particularly in rural areas, poses a challenge. Addressing this digital divide is crucial for ensuring equitable access to quality environmental education.

2. Ensuring curriculum consistency and quality

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Achieving consistency in curriculum integration across different educational boards and regions can be a challenge. Ensuring high-quality content, relevant to local contexts, and regularly updated is crucial. The development of National Curriculum Frameworks by NCERT will play a crucial role.

3.Overcoming resource constraints and funding gaps

Implementing the proposed reforms requires significant investment in infrastructure, teaching materials, and teacher training. Ensuring adequate funding and resources, particularly for schools in rural areas, is essential.

4.Fostering collaboration and community engagement

Environmental education necessitates a collaborative approach involving government agencies, educational institutions, NGOs, and local communities. Promoting community-based programs and involving local stakeholders is crucial for long-term behavior change. Initiatives like Mission LiFE and Eco Clubs encourage active participation in community-based environmental initiatives.

Case studies and examples

Several initiatives are underway across India demonstrating efforts to promote environmental education:

- Delhi's Lead School Program: This program designates a Lead School to guide and train 25 other schools on environmental education activities, facilitating knowledge dissemination.

- Barefoot College in Tilonia: This college trains rural youth and women as barefoot solar engineers, bringing solar technology to villages and promoting self-sufficiency.

- Aksharnandan School in Pune: This school integrates sustainable practices like water conservation, waste management, and organic farming into its curriculum, creating an exemplary model for environmental education.

- Convent of Jesus and Mary School, Mussoorie: This school has implemented a streamlined waste management model, teaching students segregation and involving them in recycling initiatives.

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These examples showcase the potential of environmental education in creating a sustainable future for India.

Measuring environmental literacy outcomes

Environmental degradation has become a serious source of concern for contemporary society, giving rise to efforts in the way of advocacies, conferences and awareness campaigns at different levels. It has been widely acknowledged that environmental literacy, which is an outcome of environmental education, can provide a strong foundation for future environmental responsiveness, as well as help in the transition towards more sustainable societies and healthy living.Assessing the impact of environmental education initiatives requires a robust framework to measure changes in students' environmental awareness, attitudes, and behaviors. This includes developing standardized assessment tools, conducting surveys and evaluations, and tracking relevant indicators like participation in environmental activities and the adoption of sustainable practices.

Conclusion and the path forward

Since we all are very aware of the fact that there is no living without home and life without environment, it is very important to take immediate action to healthify our environment which is on verge of extreme degradation in order to make our living in this planet possible. This so called eco- unfriendly human deeds needs to be immediately controlled leading to various kinds of pollution, global warming, soil erosion etc. Education in this context surely plays a vital role in sensitizing humans to be careful with their eco-unfriendly deeds, but for that also several above mentioned challenges needs to be catered with the help of every individual and stakeholders of the society. Immediate steps needs to be taken especially in the field of Environmental Education by improvising educational content, allotting more of time to environmental concerns, emphasizing Environmental Education as a discipline and career and also by incorporating environmental awareness and training in teacher education curriculum. Further, organizational support is also needed to fulfill the aims of Environmental Education along with becoming demanding in terms of required eligibility for various teaching professionals dealing with environment and its education. NEP 2020 provides a comprehensive framework to foster environmental literacy and build a sustainable future. By prioritizing environmental awareness and integrating sustainability, the policy aims to nurture

a generation of eco-conscious citizens. The emphasis on experiential learning, green skills, technology integration, and teacher training are key strengths.

However, successful implementation depends on overcoming challenges related to funding, infrastructure, the digital divide, and ensuring curriculum consistency and quality. A concerted effort from all stakeholders, including government, educational institutions, NGOs, and communities, is essential to translate the policy's vision into reality. By investing in infrastructure, providing comprehensive teacher training, fostering community engagement, and ensuring equitable access, India can empower its youth to become responsible environmental stewards. This will not only contribute to India's national development but also to global environmental efforts in the journey toward a greener, sustainable future.

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