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Environmental education in teacher education for sustainable development

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Abstract

Following the implementation of the National Curriculum Framework for Teacher Education, there has been a nationwide overhaul of teacher education programmes in India (NCFTE 2010). Environmental Studies pedagogy has been given a special place in the two-year B.Ed. programmes. Furthermore, Environmental and Population Education has been added as an elective course. Consciously, it has been kept in mind in the pedagogies of various school subjects: how environmental issues can be infused with various streams of study. Because the environment has no political boundaries, local issues cannot be considered in isolation. As a result, it is necessary to trace environmental education in the Indian scientific community and society, which is traditional and has its own indigenous practises. A future teacher who is informed will be able to encourage students to behave responsibly. The curriculum has therefore been purposefully designed to inform aspiring teachers about current environmental challenges and inspire them to take local action for a brighter tomorrow. The rise of new technical options and ways of life during the past century has resulted in environmental deterioration and enormous disparities between the privileged and the underprivileged. More than ever, taking care of and protecting the environment is essential. Education may provide people the perspective they need to see how human life can coexist with the environmental catastrophe while yet allowing for survival, progress, and growth. In addition, environmental studies can incorporate social and natural sciences into the curriculum of primary schools. Addressing global environmental concerns and how they affect the local community should be part of the curriculum as India moves towards sustainable development.

Keywords: NCFTE 2010, teacher education programme, NCF 2005, environmental education

Introduction

India's peninsula has been generously blessed with four distinct seasons. The country has been blessed by nature with rich vegetation, a stunning desert, outstretched arms of the Himalayas, a coastal region with bays and a delta region, and countless water features. Do people in a country with abundant flora and fauna still struggle with the question of environmental awareness? How should individuals treat the environment with respect? The worry is serious because the modernisation that people are enjoying at the expense of environmental deterioration has led to a number of environmental issues that affect both humans and other animals living on the planet. Environmental issues are primarily caused by human activity, yet humans are also the key to finding solutions (Bradley, Waliczek & Zajicek, 1999) [5]. It goes without saying that the greatest way to address environmental challenges is with the involvement of all concerned citizens, across all societal strata, and via education. At the national level, every person shall have equitable access to environmental information held by public agencies, including details on hazardous materials and activities in their neighbourhoods, and shall have the chance to participate in decision-making processes (United Nations Environment Programme, 1993).

As a result, it is determined that teacher education is a suitable setting for doing research on environmental education.

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There may be several causes, but the main one is that teachers have a significant impact on students' knowledge, attitudes, and behaviour in addition to teaching them. Also, they assist in developing curricula, prepare textbooks, and provide local guidance on a variety of subjects. Thus, by instilling attitude, interests, feelings, motivations, responsibilities, and concern for the environment in their students, teachers who are knowledgeable about environmental education can assist their students in becoming environmentally literate individuals as well as responsible citizens. Because of this, the National Council for Teacher Education (NCTE, 2005) ^[14], the statutory authority in charge of teacher education in India, firmly acknowledges the essential role that teachers and teacher educators play in raising environmental awareness among all societal segments. The NCTE emphasises the requirement that Environmental Education (EE) be made mandatory and taught as a crucial element of teacher preparation. So, the topic of this research paper is Teacher Education in India and Education for Sustainable Development. The issues raised include: What role does Indian academics play in promoting sustainable development? And where does environmental education fit into the Indian teacher training system?

Global and Local Perspective for EE in teacher education programme

The studies in support of environmental education in teacher education institutions argue that teachers for K-12 schools to produce environmentally literate people, must first have the ability to green the curriculum (Jickling, 1997; McClaren, 1989; Lin, 2002; Ormond *et al.*, 2014) ^[8, 9, 18]. Environmental education is inevitable in making people knowledgeable and aware of the environment and its problem as well as their own role in environmental conservation, preservation and management (Bhattacharjee, 2015). Furthermore, according to Shobeiri, Omidvar, and Prahallada (2006) ^[20], classroom teachers hold the key to effective environmental education; without these teachers' knowledge, abilities, and dedication to the curriculum, it is doubtful that an ecologically literate student will be developed. In order for this to happen, prospective teachers should receive specialised training. Environmental education is critical, as noted by Ravindranath (2007) ^[19], and it must be seen as such.

There have been recent initiatives to realign and reform schooling and legally establish environmental education. All subject and grade level texts have been updated to incorporate environmental concepts. He goes on to say that without adequate adjustments to teacher education curricula, the consequences of these curricular improvements won't last. Concerns are raised about people and how they interact with the environment. Do they understand the problems with the environment? How do they view the risk posed by the environment? Which kind of risk do they deem to be the greatest? And the behaviour patterns they modify to protect and rehabilitate the environment? Therefore, it is imperative that environmental education be incorporated into all levels of education, from primary school to higher education, as well as teacher training programmes. According to researchers, environmental education is a process of identifying values and delineating ideas in order to comprehend and respect how interconnected man, his culture, and his biophysical surrounds are (Bhattacharjee,

2015). The use of several pedagogical lenses, such as those of experiential education, critical pedagogy, constructivism, and place-based education, is a feature of many of the programmes that define environmental education (Ormond *et al.*, 2014) ^[18]. Also, research studies from around the world show that it is extremely difficult to incorporate environmental education and sustainability programming into teacher education. The study provides a depressing picture of how little environmental education is included as a key element in programmes for teacher preparation (Ormond *et al.*, 2014) ^[18].

Sustainable Development and EE in Indian Constitution

The search makes sense in light of the fact that the Indian government's appropriate authorities have created policies and released directives to raise environmental awareness among its citizens. Article 51A, titled "Fundamental Responsibilities," was added as the 42nd Amendment to the Indian Constitution in 1976. Hence, the duty of every citizen to preserve and enhance the natural environment, including forests, lakes, rivers, and wildlife, as well as to have compassion for all living things, is referred to in Clause (g) of Article 51A. The Water Pollution Control Act followed in 1981, and in 1986 the Environment Protection Act was established. The responsibility to safeguard and enhance the environment was outlined in the Indian constitution, and as a result, the government of India established a department of environment in 1980 and a ministry in 1985. Additionally, India adopted a new way of thinking about and experiencing development after the Stockholm Conference in 1972, known as Sustainable Development (SD). As a result, India joined the 187 other nations that signed the Rio Declaration at the 1992 UN Conference on Environment and Development, pledging to fulfil an important commitment towards SD. Nonetheless, there have been many ways in which India's common methods for promoting environmental education have fallen short throughout time. Unfortunately, environmental education is currently associated with "Environmental Studies," which focuses on giving children scientific facts and figures on global environmental problems, despite the fact that the government of India has adopted a number of recommendations from agencies constituted to promote sustainable development (Siddiqui, Siddiqui & Khan, 2006) ^[22]. Some environmental concerns have been introduced into the curriculum by the Indian educational system. The Indian Education Commission (1964–1966) suggests that environmental studies be taught in Grades III and IV (NCERT, 1970) ^[10]. The Government of India approved the establishment of the Centre for Environment Education as a Centre of Excellence in 1984, recognising the significance of environmental education in India. At the time, it was the only organisation actively involved in environmental education.

Many Education Commissions, including the National Policy of Education-1986 Commission, have recognised the necessity of environmental education (Bhattacharjee, 2015). Hence, it has been underlined in the National Policy on Education (NPE) 1986 (updated in 1992) that there is a crucial need to foster environmental consciousness and that this feature would be incorporated into the entire educational process (Government of India, 1986). In 1985, M.C. Mehta, an Indian attorney, convinced the Supreme Court of India to rule that Article 21 of the Indian

Constitution, which grants each citizen the "right to life," also entails the "right to a healthy environment." This decision marked the beginning of a transformation in Indian environmental law. After that, in 1991, the Supreme Court of India agreed that environmental awareness should be spread through education and that lessons on how to reduce pollution should be taught as a required subject. To fulfil the fundamental responsibilities of individuals to "guard and preserve the natural environment," as outlined in India's Constitution, Mehta got the original Supreme Court order in 1991 demanding mandatory environmental education. This gives the University Grants Commission, which oversees undergraduate and graduate education, instructions on how to take the necessary actions to prescribe a course on the environment in universities. The Supreme Court of India further adds that each State Government and each Education Board associated with education, up to secondary schools or Grade X or even intermediate colleges (Senior Secondary or Grade XII), must immediately take steps to enforce mandatory education on the environment in a graded manner. The Supreme Court of India then instructed its States and other authorities to take measures to ensure that educational institutions under their jurisdiction should undertake the steps they had taken in order to ensure its implementation in 2003. Any institution that fails to comply with these rules should be viewed as disobeying orders and subject to disciplinary action. The ruling may be reported as "The Honorable Supreme Court has asked the NCERT to establish a model syllabus for environmental education to be taught at different grades in its judgement issued on December 18, 2003 in Writ Petition No 860 of 1991. The conference made the following declaration: "Through education, human lifestyles can be achieved that support ecological integrity, economic and social justice, sustainable livelihoods, and respect for all life. We may learn to prevent and resolve conflicts, recognise cultural variety, build a compassionate society, and live in peace via education". Since the United Nations Educational, Scientific and Cultural Organization (UNESCO) identified teacher education programmes and teacher educators as major players in the reorientation of education to address sustainability as early as the 1990s, the study of environmental education in teacher education programmes and institutions has gained prominence (UNESCO, 2005). According to NCF 2005, a student should be actively involved in joyously discovering and harmonising with their environment during the primary stage. The goals are to foster the child's worldly interest at this point (natural environment, artefacts and people). Furthermore, social science as well as science should be combined to study the environment with a focus on health. The child should be continuing to learn more about the environment and health as they move through upper primary. Students should be involved in activities and research on environmental and health-related topics at the secondary level.

Environment, Society and Culture

In one verse of the Atharvaveda, the Vedic perspective on the environment is succinctly stated as follows: "Wisely utilise three components variably which are varied, visible and full of attributes. Water, air, and plants or herbs are these. Tiwari outlines the elements that make up the universe in accordance with the indigenous idea outlined in

the Upanishads. When the subject of what India and Indian academia stand to gain by promoting sustainable development is brought up, it becomes clear that Indian culture, society, and education are clearly intertwined. The scriptures said that in ancient India, schools, or gurukuls, were residential in nature, with the Shishyas, or students, and the Guru, or instructor, living close by (Altekar, 1934)^[2]. We are surrounded by and a part of our environment in the very word 'Paryavarana', which means Environment. The Atharvaveda uses terminology like Vritavrita, Abhivarah, Avritah, and Parivrita to describe these five fundamental elements: earth or land, water, light or lustre, air, and ether. As a result, the balance between and among these components or elements and living things has been preserved by nature. The Vedas said that in ancient India, schools, or gurukuls, were residential in nature, with the Shishyas, or students, and the Guru, or instructor, living close by (Altekar, 1934)^[2]. The Environment (Protection) Act of 1986 defines the environment as including water, air, and land as well as the relationships that exist between those elements and with people, other living things, plants, microorganisms, and property. These meanings and versus from the Vedas are in agreement with that definition. More specifically, the Upanishads state that "From Brahman arises space, from space arises air, from air arises fire, from fire arises water, and from water arises earth" to illustrate the interdependence of these five major elements (Earth, Air, Space, Water, and Fire) in relation to Brahman (or supreme reality), from which they arise (Baranwal, 2011)^[3]. Environmental education is emphasised in the Manusmriti (Bhattacharya, 2014)^[4] dictum for pollution control, which states that:

1. Biodiversity refers to all living forms commonly referred to as Chara (movable living world) and - Achara (immovable: plant kingdom),
2. Pollution is the degradation of the five gross elements by immoral behaviour,
3. Contamination is any behaviour harmful to wholesomeness,
4. Plant storage organs including tuberous roots and underground stems, lush vegetables, lovely flowers, delectable fruits, timber-producing trees, and crops, among others, continued to be objects of attraction during that time.
5. The preservation and domestication of animals, the preservation of biodiversity, and the practise of vegetarianism are all given importance. Manu claims that agriculture hurts animals, especially insects and soil-borne pathogens,
6. Fish of all kinds should not be killed for food purposes, he said, and one-hoofed animals, village pigs, solitary animals, and unknown beasts should also be protected. Carnivorous birds, birds that live in village habitats, birds with webbed feet, diving birds that feed on fish, and birds with pointed beaks should also not be killed for food, he added.

The first recipient of the Nobel Prize in India, Rabindra Nath Tagore, had a clear vision for how the environment should be a vital component of human existence and education. He envisioned a system of education based on enjoyable learning and tailored to the specific needs of each kid, one that was profoundly anchored in one's immediate surroundings while also being connected to the cultures of

the rest of the globe. He believed that a curriculum should be organically based on nature, with lessons taking place outside under the trees so that students could appreciate the fluidity of the plant and animal kingdoms and seasonal changes on their own. As a result, he established the "Visva-Bharati" Vishwa Vidyalaya (or University) at Bolpur, India, within the realm of mother earth. Hence, sustainable development has always been the norm and way of life in Indian civilization.

Initiatives towards Environmental Education for Sustainable Development

When it comes to integrating sustainable development and EE in teacher education and school education, policy makers and educational reformers in Indian education have been sincere in their intentions. In an effort to integrate the environment into education, Mahatma Gandhi advocated Nai Taleem, or "Basic Education," in 1937. (Almeida, 2014)^[1]. Subsequently, The National Policy on Education (1986) highlights the necessity of raising awareness of environmental issues by incorporating them into the educational process for all societal groups and at all educational levels. The last two decades were important in determining the curriculum's structure. All vocational education programmes and activities must emphasise the concept of sustainable development with a focus on fostering awareness of the important environmental concerns and the rights of all to a decent standard of living, according to the National Curriculum Framework for School Education, which was published in 2000.

Teachers and teacher educators have a critical role in raising environmental awareness across all societal segments, according to the National Council for Teacher Education (NCTE, 2005)^[14], India's main organisation for regulating teacher education (Almeida, 2014)^[1]. Despite acknowledging the value of EE in teacher preparation, it also points out the dearth of employment in the field. All vocational education programmes and activities must emphasise the concept of sustainable development with a focus on fostering awareness of the important environmental concerns and the rights of all to a decent standard of living, according to the National Curriculum Framework for School Education, which was published in 2000. Teachers and teacher educators have a critical role in raising environmental awareness across all societal segments, according to the National Council for Teacher Education (NCTE, 2005)^[14], India's main organisation for regulating teacher education (Almeida, 2014)^[1]. In addition, environmental studies can incorporate social and natural sciences into the curriculum of primary schools. The craft ought to be taught using eco-friendly supplies and combined with academic courses.

The NCF (2005) makes the few recommendations for school education. The important challenges are best addressed by integrating environmental education components into various disciplines while making sure that sufficient time is set out for applicable activities. The teaching of topics in physics, mathematics, chemistry, biology, geography, history, political science, health and physical education, art, music, etc. can all be effectively handled using this method. Exercises designed with real-world scenarios in mind become an effective way to engage students. Also, the National Curriculum Framework for Teacher Education (NCFTE, 2009–2010) strongly advises that teachers rethink

citizenship education in terms of human rights and critical pedagogy, place a focus on the environment and its protection, and highlight sustainability (NCTE, 2010)^[17]. Moreover, the rights perspective, which argues the importance of education in upholding a democratic social order, encompasses the critical viewpoint of environmental education. The Department of Education in Science and Mathematics is responsible for carrying out research, development, training, evaluation, and extension activities related to science, mathematics, and environmental education, particularly for the upper primary, secondary, and higher secondary stages, according to the Annual Report by NCERT (2013–14). The creation of curricula, textbooks, and other instructional resources for environmental education has been an important area of the department's activity. The Department's Instructional Material Center (IMC) organises the Jawaharlal Nehru National Exhibition for Environmental Education for Children in addition to collecting and disseminating information on all facets of environmental education. In accordance with the Honorable Supreme Court's Decision, this Department within NCERT is also tasked with monitoring how environmental education is being implemented by all States and UTs (NCERT, 2015)^[16]. National Education Policy (NEP, 2016)^[11], a very recent document, urges schools to assist in instilling important traits and behaviours such as punctuality, cleanliness, self-control, diligence and an entrepreneurial spirit, sense of duty, desire to serve, responsibility, creativity, sensitivity to greater equality, respect for women, care for the elderly, a democratic temperament, and a responsibility to protect the environment (NUEPA, 2016)^[11]. However, only if all segments of society have equal opportunity can a nation achieve sustainable development. NEP also understands how critical it is to start working hard today to meet the Sustainable Development Goals (SDGs) by 2030.

EE and Sustainable Development in Teacher Education Programmes

The Diploma in Elementary Education (D.Ed. or D.El.Ed.), Bachelor of Education (B.Ed.), and Master of Education (M.Ed.) are recognised and accredited by India's National Council of Teacher Education (NCTE) programs for teacher education have been completely redesigned across the nation. The Pedagogy of Environmental Studies for D.Ed. (two-year programme) has the following specific objectives:

- assist student-teachers in internalising various views of curriculum structuring and understanding the scope of environmental sciences.
- enable student-teachers to explore the scientific and social-science perspectives of the students.
- Educate student instructors on how to organise and conduct classroom activities in light of various theoretical perspectives on learning.
- To train future educators to use various methods to evaluate students' learning.

The teacher educator should have a master's degree in a social science or natural science and have knowledge of environmental education. The syllabus's units are designed to introduce the following ideas to student or trainee teachers:

- Unit 1: Concept of Environment Studies
- Unit 2: Understanding Children's Ideas

- Unit 3: Classroom Transaction and Assessment
- Unit 4: Planning for Teaching
- Unit 5: Proficiency in Environmental studies

Population Education is the name of the B.Ed. course for environmental education. The course aims to provide the teacher students with the knowledge and skills necessary to:

1. Comprehend the idea of population and environmental education.
2. Know the goals and techniques of teaching environmental and population;
3. Be aware of population and environmental education policies.
4. Assist teacher students in analysing a variety of population and environmental education-related issues.

The main topics covered in the course include the notion of environmental education, sustainable development, and environmental education-related issues. The Pedagogy of Environmental Studies requirement for B.El.Ed. programmes is outlined in the NCTE's Gazette Notification (2009) [15].

Eco-Feminism in Teacher Education

The course Environmental & Population Education is where Eco-feminism is taught in the Bachelor of Education (B.Ed.) curriculum. Although though Françoise d'Eaubonne, a French writer, first used the word in 1974, the Indian context is where it is most relevant. Environmental protection for sustainable development has discovered that women in India have a significant part in leading illustrious social movements and eco-friendly domestic practises. In response to projects that threaten to uproot people and affect their fundamental human rights to land, water, and the ecological stability of life-support systems, environmental movements have emerged from the Himalayan regions of Uttar Pradesh to the tropical forests of Kerala, from Gujarat to Tripura. The importance of women in the success of movements cannot be overstated. Examples include the Chipko Andolan, Save the Bhagirathi and Stop Tehri project committee (Manu, 1984) in Uttar Pradesh, Save the Narmada Movement (Narmada Bachao Andolan) in Madhya Pradesh and Gujarat, youth organisations and tribal people in the Gandhamardan Hills whose survival is directly threatened by development of bauxite deposits. In Indian communities, where women are still mostly in charge of the private realm, gender sensitivity in environmental education is seen as crucial (household and childcare). Being the primary household manager gives women a unique understanding of the environment, but on the other hand, women in cultures continue to be excluded from the public arena where important choices on environmental issues are made. Due to the fact that women in India still have a disadvantage, just 78% of them have completed secondary school compared to 80.4% of men, it is important for teacher education programmes to integrate the fundamental concept and substance of ecofeminism (World Bank, 2013).

Conclusion

According to estimates, 70% of Indians reside in rural areas where they are frequently surrounded by and near to nature. Due to the ancient ties that bind Indian civilization, no education system could be considered without taking the local community into consideration. As a result, the Indian

educational system combines the ancient, environmentally friendly practises with the curriculum for both secondary and higher education. But, contemporary India occasionally finds itself in a condition of turmoil, unsure of how to advance without doing havoc. As a result, there are protests and demonstrations by the locals who live in harmony with nature and depend on it for their livelihood. It's intriguing that Indian traditional traditions promote sustainable development as well as pro-environmental behaviour in everyday life. Environmental problems and worries are surfacing as a result of time and rapid development. As soon as India noticed the impending catastrophe, regulations and suggestions were established to raise environmental awareness among its inhabitants and encourage environmentally responsible behaviour. Education acted as a vehicle in this regard, and a top-down strategy has been upheld. One of such historic endeavours is the inclusion of environmental education and studies in teacher education curricula. A future teacher who is informed will be able to encourage students to behave responsibly. The curriculum has therefore been purposefully designed to inform aspiring teachers about current environmental challenges and inspire them to take local action for a brighter tomorrow. India has kept up with international trends by introducing numerous policy reforms that call for environmental education and education for sustainable development with the goal of modernising the educational system (Supreme Court of India, 2003; National Commission for Education Research and Technology, 2005; National Council for Teacher Education, 2009; National Council of Teacher Educators, 2005). (Almeida, 2014) [1]. According to NCF 2005 and NCFTE 2010, the pedagogies of the various school disciplines have been designed to preserve environmental themes and issues in the curriculum. Given the societal role that gender plays in Indian society, it is thought vital to acknowledge the contributions of women to various campaigns to halt environmental destruction. Also, society's routine tasks, values, and customs shouldn't be ignored. The activity-based practicum curriculum created for teacher education programmes aids in identifying and promoting pro-environmental behaviour. Yet, there is still a long way to go in environmental education for sustainable development, which is tailored for different levels of academe. In this context, the NEP 2016 [11] acknowledges the need to address Goal 7 of the Millennium Development Goals by 2030 in order to maintain environmental sustainability. In conclusion, whether the school teachers who have experienced the new curriculum (after NCFTE 2010) are successful in instilling knowledge about sustainable development among their students still has to be put to the test in India's teacher education programmes.

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