

Incorporating Indigenous Knowledge Systems into Environmental Education for Sustainable Development

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Abstract

Indian history is extensive and includes everything from the invention of the zero to the creation of novel medical treatments or technological advancements. The traditional Indian knowledge system has continuously demonstrated its sustainability and commitment to advancing the welfare of all societal members. Indigenous knowledge has gained importance in science and technology in recent years. But it also has a big impact on environmental education. Global suffering is a result of climate change, and advances in science and technology are not lessening this suffering. Nonetheless, the Indian and indigenous knowledge systems can help mitigate its effects. Since past events demonstrate that human activity had no impact on the planet. Education can support education for sustainability, respect indigenous people's values, and advance justice for them by incorporating environmental educational programs. The article outlines the cross-country approaches and practices to incorporate indigenous knowledge into environmental education for sustainable development. Indigenous knowledge has a lot of advantages. It is relevant to culture because it can encourage people to take action to preserve and restore their local environment and give them a sense of responsibility for it. Additionally, it provides comprehensive viewpoints on environmental problems and their fixes. Indigenous knowledge acknowledges the interdependence and connectivity of all living things and frequently includes spiritual, ethical, social, and ecological aspects of human-environment interactions. We have considered rivers, trees, and animals as gods and thus protected them since ancient times. However, because of the disruptions to modern culture, very few people still adhere to this. For this reason, it is crucial to include indigenous knowledge and the Indian knowledge system in environmental education to protect the environment. Lastly, the paper delves into the potential institutional, ethical, and cultural obstacles that arise when integrating indigenous knowledge into environmental education.

Keywords: Indigenous knowledge, environmental education, sustainability, sustainable development, economic, environmental resilience

INTRODUCTION

Indigenous people are defined as those who were residing in a territory before it was claimed by colonial powers; however, in modern times, this definition is fluid and depends entirely on an individual's self-identity. Indigenous knowledge encompasses a wide range of topics, including environmental protection, weather forecasting, agricultural productivity, water management, and land use patterns. Numerous studies in this field have emphasized the value of indigenous knowledge as a framework, ideas, guiding principles, practices, and measures that can serve as the basis for an efficient development process aimed at re-establishing the social, economic, and environmental resilience of the population.

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According to numerous studies conducted in this field, indigenous knowledge offers helpful frameworks, concepts, guiding principles, practices, and measures that can serve as the basis for an efficient development process aimed at re-establishing the social, economic, and environmental resilience of the global community [1].

Indigenous communities produce unique knowledge and interpretations of reality through a complex process of cultural construction. However, because of a hegemonic epistemological model that legitimizes and produces a true monoculture of knowledge, these unique perspectives are rendered invisible, marginalized, and seen as inferior social experiences [2].

Agarwal (2008) demonstrates that native wisdom is effective and efficient with resources and that they have managed and conserved their resources far better than India's resource-intensive and externally imposed technocratic management system.

Given that it is not ingrained in official institutions, this knowledge and these people have been the foundation for maintaining the delicate ecosystem without receiving much acknowledgment or gratitude. Indigenous knowledge aids the conservation of biodiversity and lowers carbon emissions through sustainable land management. In the modern world, indigenous knowledge systems have not disappeared completely. One could argue that colonization and colonial policies are the primary causes of environmental problems. The native knowledge of India began to fade away after hundreds of years of regulation and numerous social and political upheavals. The British, seeking to establish dominance over the country, completely eradicated indigenous knowledge. India possesses vast knowledge, but we claim that because we are still not independent, we assimilate all Western culture, including its knowledge.

The globe is evolving. Resources are depleted, nature is destroyed daily, and global climate change has a significant impact on people's well-being. Who knows if a generation that grows later will witness everything that we do? As for the resources we now have, well, they are all products of the knowledge of earlier generations who valued resource conservation and Mother Earth preservation. However, this indigenous knowledge has also been lost over time. Indigenous knowledge should be included in environmental education or general education programs to protect the environment. Incorporating these sustainable indigenous practices will aid in environmental protection, even though we have studied environmental education in our curriculum.

Most indigenous knowledge is employed in India's agricultural industry. Mixed cropping is a crop management method. The manure is used in grain storage techniques. Weather prediction is based on the movement of ants when they relocate with eggs to a safer area. They used to preserve the forest using the concept of sacred grooves, whereby the village restricted forests with its supply forest. This was done in Northeast India.

This work describes the concept of sacred grove and shifting cultivation as ecologically sustainable methods of managing land and forest cover among tribal communities in Tripura, North East India [3]. The predominant agricultural practice was mixed cropping, which not only conserved the soil but also provided people with a diverse range of crops. Ladakh also witnessed this phenomenon. Ladakhi's traditional agricultural system is distinguished by a meticulous crop rotation schedule, management of organic waste, use of livestock for threshing and plowing, and avoidance of chemical fertilizers.

OBJECTIVES

- Examine how incorporating indigenous knowledge into formal educational frameworks improves comprehension, participation, and action to support sustainable development objectives.
- Examine institutional practices pertaining to sustainable development and obstacles to the integration of indigenous knowledge into formal education systems.

- Determine effective case studies and best practices for incorporating indigenous knowledge into environmental education.

RESEARCH METHODOLOGY

The purpose of this study was to investigate the integration of indigenous knowledge systems into environmental education for sustainable development. We chose a comparative case study design to investigate various methods for incorporating indigenous knowledge systems into environmental education in a range of settings. It examines how native knowledge systems are incorporated into environmental education courses. What are the advantages and disadvantages of doing so? For this purpose, I collected qualitative information to give readers a thorough grasp of the subject and used information from blogs, published research articles, and other secondary sources.

CROSS-COUNTRY PRACTICES

A small number of international programs have been implemented in Canada. A few programs are made to help students deal with the problems of colonization and colonialism in their communities and to help heal and decolonize people on a personal, social, and political level. They support resistance tactics against contemporary injustices and encourage the creation of a nation and community that are sustainable and thriving while adhering to traditional cultural values.

We already had this education in our curriculum—the Gurukul system in India, which promotes the study of both material and spiritual matters—and the government ought to now work to put this knowledge into practice to safeguard and preserve our environment and culture. The new education policy attempts to incorporate elements of the Indian knowledge system into the curriculum.

Additionally, efforts are being made in nations such as South Africa. Namibia and other Latin American nations have taken the initiative to improve their educational policies, leading to positive changes. Certain educational initiatives seek to address issues related to students attending school and achieving their academic goals while preserving their cultural identity and integrity.

Countries such as Nigeria adopt an integrated teaching methodology with an emphasis on local instruction. They incorporated indigenous knowledge through both formal and informal means. Science teachers in South Africa are required by the new 2005 education policy to incorporate indigenous knowledge systems into science curricula.

In Kenya, trade training, socialization opportunities, and skill development are offered to a large number of Kenyan youths who have either never attended or left the formal education system. The majority of Kenya's ethnic communities share common elements in their knowledge-transmission processes, which occur in the context of families, communities, clan tribes, and cultural age groups [4].

While Latin America and the Caribbean have successful models, some models or countries have been successful enough to incorporate such indigenous knowledge, while other countries, such as Australia, failed to do so.

IMPORTANCE OF INCORPORATING INDIGENOUS KNOWLEDGE IN THE EDUCATIONAL SYSTEM

Education has a significant impact on how one thinks and how capable they are of achieving their objectives. We can determine the effects on the environment through learning. Therefore, by integration, we can preserve traditional or indigenous knowledge for sustainable growth. In this way, we can determine what is right and wrong. Establishing a peaceful atmosphere requires adhering to the values of equity and respecting one another.

The community's desire to see the teaching of vernacular language in schools is another element to consider when analyzing the linguistic ecology of indigenous groups and how it relates to education [5].

The potential advantages of integrating knowledge and technology include reducing soil erosion, increasing water availability, and improving seeding, cultivation and harvesting, and storage procedures. These kinds of upgrades will strengthen services that depend on biodiversity, such as the supply of food and fiber, the availability and purification of water, and the improvement of air quality [6].

An important part of creating Indigenous Knowledge Systems (IKS) is the Traditional Knowledge System (TKS), which emphasizes the value of local, folk, and indigenous communities in maintaining important knowledge. In particular, in ecosystems, IKS focuses on managing biodiversity at the level of individual communities, offering a prompt and efficient means of attaining sustainability [7]. Currently, climate change is a critical issue, and without climate literacy, people will not be able to mitigate its effects. It will be beneficial if someone is aware of climate change and the best course of action. Sustainable development will therefore benefit from the provision of environmental knowledge through environmental education that incorporates indigenous knowledge.

The economy's need for resources has risen in tandem with population growth. Restoring natural resources is time-consuming. However, we use these resources so quickly that the next generation will never see many of the things we take for granted today. More science, technology, and other things that we believe to be environmentally friendly are being used are harmful to the environment. For instance, in the case of green technology, electronic vehicles operate solely on batteries and do not emit any emissions from burning petrol or diesel. However, there is uncertainty about what happens to these batteries after they decompose and what effects they will have.

Indigenous knowledge, though outdated, follows sustainable guidelines. A few topics that can be included in the curriculum are fundamental to environmental protection, the production of food through sustainable agriculture practices, and the use of organic fertilizers, which have a lower negative impact on the soil.

To co-develop educational programs and provide students with practical or hands-on learning experiences, such as sustainable agricultural techniques, resource management, and conservation techniques, partnerships and collaboration with indigenous knowledge communities are necessary.

People in earlier times protected banyan trees and peepal trees by considering them sacred because these trees have medicinal properties and are also a rich source of oxygen. Adapting to the local context is necessary to understand these practices, which were followed by indigenous people. Integrating indigenous ecological knowledge into the formal education system through curriculum development, teacher training programs, and school programs. Fostering long-term engagement with the community and learning their knowledge in the curriculum can help secure natural resources.

Understanding indigenous knowledge, in conjunction with environmental education, may have numerous effects. The effects on the environment and climate change came first. Of course, this will have a positive effect. Climate literacy has a significant effect on sustainability. Education can help one to understand the function of each resource in human life. Lifelong learning is aided by incorporating environmental knowledge. Formal education does not have to be used to impart this knowledge; non-formal approaches such as community learning and programs can be just as beneficial. However, incorporating this knowledge into formal education can help students grasp it at a very basic level, such as from childhood, instilling in them a sense of the importance of Mother Earth, and helping them develop those values at a very young age.

Working with students to choose courses within Environmental Studies and across campus, the Indigenous Knowledge and Environmental Sustainability focus area advisor helps them understand how

indigenous peoples are addressing issues such as climate change, reviving their communities, restoring native landscapes, returning to traditional food systems, re-establishing long-held sustainable practices, and bolstering traditional ecological knowledge.

Engaging with the natural world and understanding and protecting the environment can be aided by implementing eco-friendly practices. Furthermore, sustainable methods that uphold sustainable practices have always protected the environment. By lowering waste, releasing less effluent into the environment, and making efficient use of resources, their knowledge will be incorporated into environmental education and research, contributing to the preservation of Mother Nature. Recognizing the interdependence of our ecosystems and the ways in which human activity affects them encourages care. Understanding our duties to protect all of Earth's resources and species is made easier by adopting a stewardship mindset.

There is a need to integrate indigenous knowledge with global efforts to address the challenges posed by modernization and globalization.

CHALLENGES IN INCORPORATING INDIGENOUS KNOWLEDGE IN EDUCATIONAL SYSTEM

Education for environmental awareness and behavior has many potential advantages, but its efficacy and reach are constrained by numerous obstacles and difficulties. A few of these are insufficient funding, encouragement, and incentives for teachers and students; poor pedagogy, curriculum, and evaluation techniques; opposition and doubt from certain groups and stakeholders; and conflicting agendas and interests in the political and economic arenas. It will be necessary for educators to first comprehend indigenous knowledge and have all the necessary practical experience before incorporating it. However, most of them might be dubious about doing so. Other difficulties in incorporating indigenous knowledge into traditional scientific education include curriculum development, pedagogical modifications, and the requirement of teachers who are skilled in utilizing both knowledge systems [8].

However, several opportunities and initiatives can overcome these obstacles and support environmental education. These include working together, forming partnerships with various actors and sectors, and integrating and innovating the educational system. This is possible by addressing some of the knowledge gaps for development that are currently formulated from a Western perspective, by incorporating indigenous knowledge into the formal education system. The transmission and preservation of indigenous knowledge occur through traditional education.

In this era of internationalization, it is very hard to include such indigenous knowledge in the educational system. Second, the opinions of all parties involved must be considered before introducing such things.

In some cases, this field exists because the community has advocated for certain rights and wanted its members to participate in decision-making; however, these projects were never carried out.

Indigenous knowledge and teachings have largely been rejected by the majority of European settlers as false epistemologies. Indigenous learners have been alienated from formal education because of disrespect for indigenous epistemologies and theft of knowledge and its products. This has also contributed to a history of mistrust between indigenous people and higher education institutions [9].

The ethical challenges of acknowledging and integrating diverse knowledge systems are central to integrating indigenous knowledge into environmental education for sustainable development. The risk of misappropriating or commodifying traditional ecological knowledge (TEK) and the potential marginalization of indigenous perspectives in mainstream curricula present ethical challenges. These

difficulties are made more difficult by the incommensurability of local and global values as well as the conflict between neoliberal agendas and environmental demands. Furthermore, by giving economic development precedence over ecological concerns, the anthropocentric focus of education for sustainable development (ESD) may compromise the effectiveness of environmental education. It is interesting to note that despite the fact that indigenous knowledge is essential to sustainability, integrating it into the classroom can be challenging due to issues such as ensuring epistemological justice and negotiating the disparities between Indigenous and Western scientific worldviews. The principles of need-based, people-centered sustainable development may be more realistically attained using a bottom-up strategy [10].

SUGGESTIONS

People can better understand and value the natural world and how it interacts with human activity by acquiring knowledge, skills, values, and attitudes that education can help them develop. Therefore, using indigenous knowledge of the environment, along with encouraging creativity and critical thinking, education can also help people find innovative and long-lasting solutions to environmental problems. Additionally, by encouraging civic engagement, ethical responsibility, and global citizenship, this education can inspire people to take up environmental initiatives and reduce their impact.

This study emphasizes the importance of considering students' prior knowledge and perspectives when creating curriculum content related to sustainability, as this will result in more impactful and relevant learning opportunities. Teachers can create more engaging and interest-generating educational programs for sustainable development by considering students' implicit knowledge [11].

The influence of education on environmental consciousness and behavior varied. This should begin at the base. Therefore, we started environmental education at the primary level. In India, the practice of vanmhotsav and other such programs have helped children become familiar with Mother Earth at a very young age. According to certain studies, formal education, especially at higher levels, can raise environmental awareness and literacy, but it may not always result in actions that support the environment. According to other research, non-formal and informal learning activities such as social networking, media exposure, experiential learning, and community involvement can have a bigger impact on environmental behavior, particularly when they are meaningful, applicable, and empowering for students. Consequently, it might be more successful to combine several educational approaches that are adapted to learners' needs and context to improve environmental awareness and behavior.

CONCLUSION

Future efforts to integrate indigenous knowledge into environmental education are critical for promoting resilience, equity, and long-term sustainability in global efforts to protect the planet. By acknowledging and incorporating traditional wisdom, practices, and values, educational initiatives can foster a deeper connection with the environment and promote more inclusive approaches to conservation and sustainability. This integration enhances educational experiences and provides communities with the tools they need to effectively contribute to environmental stewardship.

Traditional land-based learning fosters socio-environmental identity. Such learning is centered on lived experiences, praxis, and shared meaning and knowledge-making, rather than simply imparting certain universal content or environmental knowledge. These areas value the wisdom and experiences that older people share with the younger generation. Learning occurs both indoors and outdoors, providing opportunities for intergenerational inquiry and comprehension of physical surroundings. In this sense, the land serves as both a teacher and a classroom, encouraging students to cultivate a spiritual bond with their environment and teaching them to pay attention to the natural world. Finally, learning to listen, comprehend, and connect with land will teach students to be stewards of the natural world's health and welfare.

The people who have the most knowledge are those who destroy the environment, despite the fact that we talk about climate literacy and comprehend environmental knowledge. Many forests are being destroyed, agricultural land is being transformed into commercial space, water bodies are being contaminated, and air quality is compromised in the name of employment opportunities and development projects.

What use does this knowledge have? However, this is a challenging task. Although there are many challenges in incorporating indigenous knowledge into environmental education, it will undoubtedly aid in sustainable development.

To meet these challenges, educators, policymakers, and indigenous communities must collaborate to create pedagogies that respect and incorporate indigenous perspectives. This requires a nuanced understanding of the philosophical and contextual complexities at play.

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