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Echoes of the Soil: Reshaping Modern Education through Indigenous Knowledge Systems under NEP 2020

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Abstract

The National Education Policy (2020) presents a vision for an education system that is rooted in Indian culture while also preparing students for a global world. This paper aims to study the role of Indigenous Knowledge Systems (IKS) in improving modern education. It argues that present-day education often ignores local knowledge, traditions, and real-life experiences, which creates a gap between what students learn and what they live. Through the lens of NEP 2020, this paper explains how IKS can help develop critical thinking, environmental awareness, and a deeper understanding of culture. It also shows that including indigenous knowledge is not going backward, but moving forward toward a more balanced and meaningful education system. The study is conceptual and literature-based in nature and employs qualitative document analysis and narrative review of policy documents and relevant scholarly literature. The collected literature was examined through thematic analysis to identify the major dimensions of Indigenous Knowledge Systems in contemporary education. The principal contribution of the paper lies in presenting a conceptual understanding of how Indigenous Knowledge Systems can support the objectives of NEP 2020 while highlighting the opportunities and implementation challenges associated with their integration into formal education. The study concludes that combining local knowledge with modern learning is important for building responsible and well-rounded learners.

Keywords: Indigenous Knowledge Systems (IKS), NEP 2020, Holistic Education, Sustainable Learning, Indian Knowledge Traditions, Cultural Learning

Introduction: Education in contemporary India is primarily shaped by standardized

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curricula, examination-oriented systems, and memorization-based learning practices. Although such a structure has expanded educational access and improved global competitiveness, it has simultaneously distanced students from their social realities, cultural roots, and environmental contexts. Modern education frequently emphasizes theoretical knowledge while neglecting practical understanding, resulting in a disconnect between learning and lived experiences. Consequently, students often perceive education as mechanical rather than meaningful.

The National Education Policy (NEP) 2020 seeks to address this issue by advocating an education system rooted in Indian culture, multilingualism, experiential learning, and holistic development. The policy emphasizes the inclusion of Indigenous Knowledge Systems (IKS) as a means to reconnect education with local realities and cultural traditions. Indigenous Knowledge Systems refer to the collective wisdom, practices, and experiences developed by communities over generations through close interaction with nature, society, and environment (Ministry of Education).

Indigenous knowledge includes traditional farming techniques, ecological practices, local medicine, oral traditions, crafts, and cultural values that have evolved through observation and practical experience. Contrary to the misconception that indigenous knowledge is outdated or unscientific, many traditional practices are now recognized as sustainable and environmentally responsible alternatives to modern industrial methods. UNESCO has also emphasized the importance of indigenous knowledge in promoting sustainable education and ecological awareness (UNESCO 12). The metaphor of ‘soil’ effectively symbolizes the role of Indigenous Knowledge Systems in education. Soil represents roots, identity, tradition, language, and inherited wisdom. Just as plants derive nourishment from soil, learners derive meaning and identity from cultural and social contexts. When education becomes disconnected from these roots, students lose connection with their environment and community. However, when indigenous knowledge is integrated into learning, education becomes more contextual, practical, and

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relatable. The integration of Indigenous Knowledge Systems can contribute to reshaping modern education under the framework of NEP 2020. Combining traditional wisdom with contemporary education can contribute to holistic learning, critical thinking, environmental sustainability, and cultural preservation.

Statement of the Problem: Although NEP 2020 advocates the integration of Indigenous Knowledge Systems into education, classroom practices continue to be dominated by standardized curricula, examination-oriented learning, and limited contextual engagement. Consequently, there remains a disconnect between policy aspirations and practical educational implementation.

Research Gap: Although existing studies have highlighted the importance of Indigenous Knowledge Systems in sustainability, experiential learning, cultural preservation, and educational development, there remains a need for a more integrated understanding of their relevance to contemporary education under NEP 2020. In particular, the relationship between Indigenous Knowledge Systems and the practical implementation of the educational objectives of NEP 2020 requires further conceptual attention.

Objectives of the Study:

The specific objectives of the study are presented below.

1. To examine the relevance of Indigenous Knowledge Systems in contemporary education under NEP 2020.
2. To analyse how Indigenous Knowledge Systems contribute to holistic, experiential, and sustainable learning.
3. To identify the major implementation challenges associated with integrating Indigenous Knowledge Systems into formal education.
4. To discuss possible strategies for strengthening the integration of Indigenous Knowledge Systems within educational institutions.

Research Questions:

1. How can Indigenous Knowledge Systems contribute to achieving the objectives of NEP 2020?
2. What educational benefits emerge from integrating Indigenous Knowledge Systems into contemporary schooling?

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3. What institutional and pedagogical challenges affect the implementation of Indigenous Knowledge Systems in formal education?

Significance of the Study: This study contributes to the growing discourse on educational reform by providing a conceptual framework for integrating Indigenous Knowledge Systems into mainstream education. It may assist policymakers, curriculum developers, educators, and researchers in understanding both the opportunities and challenges associated with implementing NEP 2020.

Literature Review:

The significance of Indigenous Knowledge Systems in education has attracted increasing scholarly attention in recent decades. Researchers and educational thinkers have argued that culturally rooted education strengthens learners' identities, improves conceptual understanding, and supports sustainable development.

Dharampal's The Beautiful Tree provides one of the earliest and most influential analyses of indigenous education in India. Dharampal argues that pre-colonial Indian education systems were decentralized, community-oriented, and closely connected to local economic and cultural life (Dharampal 45). Gurukuls and Pathshalas emphasized practical knowledge, moral development, and experiential learning rather than rote memorization. According to Dharampal, colonial educational reforms disrupted these indigenous systems and replaced them with rigid, examination-based models that marginalized local knowledge traditions. Rabindranath Tagore also advocated an educational philosophy rooted in nature, creativity, and culture. At Santiniketan, Tagore attempted to create an environment where learning occurred through interaction with arts, community, and the natural world. His approach emphasized freedom of thought, imagination, and holistic development, which strongly resembles the vision presented in NEP 2020. Rao highlights the relevance of Indigenous Knowledge Systems in STEM education and argues that local practices can enhance scientific understanding through experiential and contextual learning (Rao 48). Indigenous agricultural techniques, traditional architecture, and ecological practices often

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demonstrate scientific principles in practical ways. Similarly, Sen and Chakrabarti state that indigenous knowledge encourages interdisciplinary learning because traditional systems integrate science, mathematics, philosophy, ecology, and ethics into a unified framework (Sen and Chakrabarti 81).

Research on NEP 2020 further demonstrates that the policy aims to decolonize Indian education by reconnecting learners with Indian intellectual traditions. The policy advocates multilingual education, vocational learning, flexibility, and experiential teaching methods (Ministry of Education). Scholars argue that Indigenous Knowledge Systems can contribute significantly to these objectives by making education culturally responsive and socially relevant.

Comparative international studies also support culturally grounded education. Finland's education system focuses on creativity, student well-being, and conceptual understanding instead of excessive testing (Sahlberg 37). Similarly, Japan incorporates moral education and cultural continuity into formal schooling to strengthen social responsibility and identity formation (Takayama 356). These examples indicate that educational modernization does not require the rejection of tradition. Instead, tradition and innovation can coexist to create balanced learning systems. UNESCO has repeatedly emphasized that indigenous knowledge contributes to environmental sustainability, biodiversity conservation, and community resilience (UNESCO 15).

While previous studies have established the importance of Indigenous Knowledge Systems for cultural preservation, sustainability, multilingual education, and experiential learning, relatively few studies provide an integrated conceptual analysis that links these dimensions with the implementation goals of NEP 2020. Existing research also offers limited discussion of practical barriers such as curriculum design, teacher preparedness, assessment practices, institutional resistance, and regional diversity. This paper addresses these gaps by synthesizing policy documents and scholarly literature to examine the educational relevance of Indigenous Knowledge Systems under

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NEP 2020, while also considering their potential contributions, implementation challenges, and possible strategies for meaningful integration into formal education.

Methodology:

This study is conceptual in nature and is based on a narrative review and qualitative document analysis of secondary sources. It focuses on conceptual analysis and interpretation rather than statistical measurement. A qualitative approach is appropriate because the study aims to understand the relevance, potential contributions, and challenges associated with integrating Indigenous Knowledge Systems into contemporary education under NEP 2020. The methodology includes the following components:

Data Sources: The study draws on secondary sources, including:

- Policy documents such as NEP 2020 and related government publications.
- Academic literature, including books, journal articles, and research papers on Indigenous Knowledge Systems and education.
- Reports from organizations such as UNESCO and other educational institutions.
- Examples of Indigenous Knowledge integration in education.

Method of Analysis: The collected literature was reviewed and analysed through thematic analysis to identify recurring themes and patterns related to the role of Indigenous Knowledge Systems in contemporary education. The analysis focused on the educational relevance of IKS, holistic and experiential learning, multilingual education, cultural relevance, environmental sustainability, community participation, and the implementation challenges associated with integrating Indigenous Knowledge Systems into formal education. The findings were then interpreted in relation to the objectives and educational vision of NEP 2020.

The study does not involve primary data collection or empirical fieldwork. Instead, it synthesizes existing literature and policy documents to develop a conceptual understanding of how Indigenous Knowledge Systems can contribute to contemporary educational practices and how their meaningful integration can be strengthened within formal educational institutions.

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Scope and Limitations:

The study is conceptual and analytical in nature. It does not include field surveys, interviews, or quantitative analysis. Although the paper provides theoretical insights into Indigenous Knowledge Systems, future empirical studies involving schools, teachers, and communities would strengthen practical understanding of implementation challenges and outcomes.

Findings:

One of the major findings of this study is that Indigenous Knowledge Systems encourage experiential and context-based learning. Unlike conventional classroom teaching that often emphasizes memorization, indigenous educational practices focus on observation, participation, storytelling, and practical application. This helps students connect theoretical concepts with real-life experiences.

Traditional agricultural practices, for example, teach learners about weather patterns, biodiversity, water conservation, and soil management through direct interaction with nature. Bagde observes that traditional weather forecasting techniques used by farmers are based on long-term environmental observation and remain practically effective even today (Bagde 109). Such approaches align with NEP 2020's emphasis on experiential and competency-based education.

The findings suggest that students understand concepts more effectively when learning is connected to their surroundings and cultural realities. Indigenous methods therefore make education more meaningful and engaging.

The study also finds that Indigenous Knowledge Systems naturally promote interdisciplinary learning. Traditional practices rarely separate knowledge into isolated disciplines. Instead, they integrate mathematics, science, ecology, ethics, and culture within practical activities.

For instance, traditional weaving involves geometry, symmetry, measurement, and artistic creativity. Ayurveda combines biology, chemistry, environmental understanding, and philosophy. Indigenous architecture reflects scientific principles related to climate adaptation and sustainability.

Sen and Chakrabarti argue that indigenous learning systems develop analytical and

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practical understanding by connecting multiple disciplines simultaneously (84). This interdisciplinary nature aligns strongly with NEP 2020's vision of multidisciplinary education.

Another major finding is the importance of language in learning. Students often understand concepts more effectively when taught in their mother tongue or regional language. Indigenous knowledge itself is deeply embedded in local languages, oral traditions, folk songs, and cultural expressions.

NEP 2020 strongly supports multilingual education, especially at the foundational level (Ministry of Education). The study finds that teaching through local languages improves classroom participation, conceptual understanding, and cultural confidence among learners.

Language also serves as a carrier of cultural memory and indigenous wisdom. Therefore, preserving regional languages becomes essential for preserving Indigenous Knowledge Systems themselves.

The study highlights the importance of community involvement in education. Farmers, artisans, tribal elders, and local practitioners possess valuable practical knowledge developed through generations of experience. However, formal education systems often exclude such knowledge from classroom learning.

Integrating community expertise into education can bridge the gap between schools and society. Students become more aware of local realities, traditional skills, and environmental practices. This makes education more socially relevant and participatory.

Another important finding is that Indigenous Knowledge Systems contribute significantly to environmental sustainability. Traditional farming, water conservation, herbal medicine, and forest management practices are often based on ecological balance and resource conservation.

UNESCO recognizes indigenous knowledge as an important resource for sustainability and environmental education (UNESCO 19). The findings indicate that integrating such knowledge into education can help students develop environmental responsibility and ecological awareness.

Challenges in Implementation:

1. Lack of Teacher Training and

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Preparedness:

One of the most significant challenges identified in this study is the lack of teacher preparedness for integrating Indigenous Knowledge Systems into formal education. Most educators are trained within conventional academic structures that prioritize textbook learning and examination performance. Consequently, many teachers lack awareness, resources, or confidence to incorporate indigenous practices into classroom teaching.

Without proper training, Indigenous Knowledge Systems may either be ignored or presented superficially without meaningful integration. Teachers may also struggle to connect local practices with scientific and academic concepts in a balanced manner. Therefore, teacher education programs must include training in indigenous pedagogies, experiential learning, multilingual teaching, and culturally responsive education.

2. Curriculum Standardization and Regional Diversity:

India's cultural and geographical diversity presents another major challenge. Different regions possess distinct forms of indigenous knowledge shaped by local ecology, language, and traditions. A centrally standardized curriculum may fail to represent this diversity adequately.

For example, tribal ecological practices in Northeast India differ considerably from traditional agricultural systems in Maharashtra or Rajasthan. Therefore, integrating Indigenous Knowledge Systems requires flexible curriculum structures that allow regional adaptation while maintaining national educational standards.

However, educational institutions often prioritize uniformity for administrative convenience and standardized testing. Balancing regional diversity with centralized educational policies remains a difficult challenge.

3. Scientific Validation and Credibility Issues:

Another challenge relates to scientific validation. Critics often question whether all traditional practices are scientifically reliable or suitable for inclusion in formal education. Some indigenous practices may lack systematic documentation or empirical testing.

The study suggests that Indigenous

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Knowledge Systems should neither be blindly accepted nor automatically rejected. Instead, educational institutions should adopt a balanced approach that encourages scientific examination, research, and critical analysis of traditional practices.

Many indigenous techniques related to agriculture, medicine, and environmental management have already demonstrated practical effectiveness over centuries. However, systematic documentation and interdisciplinary research are necessary to strengthen their academic credibility.

4. Lack of Educational Resources and Documentation:

A major practical obstacle is the limited availability of textbooks, teaching materials, and structured educational resources related to Indigenous Knowledge Systems. Much indigenous knowledge exists in oral form and is transmitted informally through generations.

As older generations decline, there is a risk that valuable traditional knowledge may disappear permanently. Schools and universities often lack curriculum materials that effectively integrate local knowledge into formal education. Therefore, institutions and researchers must actively document indigenous practices and develop accessible educational resources.

5. Problems in Assessment and Evaluation:

Conventional examination systems primarily measure memorization and written performance. However, Indigenous Knowledge Systems emphasize practical understanding, observation, creativity, and community participation. Existing assessment models are therefore often inadequate for evaluating indigenous learning outcomes.

Practical ecological understanding or traditional craftsmanship cannot always be measured through standardized written examinations. The study suggests alternative assessment methods such as projects, fieldwork, oral presentations, portfolios, and community-based learning activities.

NCERT also recommends competency-based assessment approaches for integrating Indian Knowledge Systems into school education (NCERT 22).

6. Institutional Resistance and

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Colonial Mind-sets:

The study further identifies institutional resistance as a significant barrier. For decades, formal education in India has been heavily influenced by colonial educational structures that privileged Western knowledge systems while marginalizing indigenous traditions. As a result, indigenous knowledge is sometimes perceived as informal or less scientific. Changing such attitudes requires both structural and ideological transformation within educational institutions. Indigenous Knowledge Systems should be viewed not as alternatives to modern science but as complementary systems that can enrich education through contextual and sustainable perspectives.

Discussion:

The findings of this study demonstrate that Indigenous Knowledge Systems can significantly transform modern education by reconnecting learning with culture, environment, and community life. Modern education systems often prioritize competition, standardization, and abstract knowledge, which can alienate students from their lived realities. Indigenous Knowledge Systems, however, emphasize interconnectedness, ethics, sustainability, and experiential learning.

The integration of IKS under NEP 2020 represents an important attempt to decolonize education and restore cultural relevance within learning processes. Multilingual education, experiential learning, and interdisciplinary approaches advocated by NEP 2020 closely align with indigenous pedagogical traditions.

The study also reveals that Indigenous Knowledge Systems contribute meaningfully to critical thinking and ecological awareness. In a world facing climate change, environmental degradation, and cultural homogenization, indigenous practices offer valuable lessons in sustainability, community resilience, and responsible living. However, successful implementation requires institutional commitment, curriculum reform, teacher training, and innovative assessment methods. Indigenous Knowledge Systems should not be romanticized uncritically, nor should they be dismissed as outdated. Instead, education systems must encourage dialogue between traditional wisdom and contemporary scientific knowledge.

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Successful implementation of Indigenous Knowledge Systems requires coordinated policy support, teacher capacity building, curriculum flexibility, community participation, and locally contextualized learning resources. International experiences also demonstrate how education systems can incorporate cultural context, local knowledge, and traditional values into contemporary education. For example, Finland emphasizes phenomenon-based learning and local contextualization, while Japan integrates cultural values and moral education into formal schooling. These examples demonstrate that educational modernization can coexist with cultural rootedness and contextual learning. India can draw relevant lessons from such approaches by encouraging regional curriculum flexibility, strengthening teacher education programmes, promoting community participation, and developing locally relevant learning resources aligned with NEP 2020. Such approaches may help create an education system that connects modern knowledge with local contexts while preserving cultural identity and promoting holistic learning.

Conclusion:

This study concludes that Indigenous Knowledge Systems possess immense potential to enrich and reshape modern education in India. By connecting learning with culture, language, environment, and lived experiences, IKS makes education more meaningful, inclusive, and sustainable.

The National Education Policy 2020 represents a major step toward recognizing the importance of indigenous knowledge within mainstream education. The policy promotes multilingualism, experiential learning, interdisciplinarity, and cultural rootedness, all of which align closely with Indigenous Knowledge Systems.

The study demonstrates that integrating indigenous knowledge can strengthen critical thinking, environmental responsibility, cultural identity, and practical understanding among learners. However, successful implementation requires teacher training, curriculum reform, institutional support, and innovative evaluation methods.

Education may be compared to a tree in which Indigenous Knowledge Systems form the roots, providing identity,

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nourishment, and stability, while modern education forms the branches reaching toward innovation and global opportunities. For education to flourish meaningfully, both roots and branches must grow together in harmony.

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