



THE ROLE OF TECHNOLOGY IN PRESERVING INDIAN KNOWLEDGE SYSTEMS

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ABSTRACT

Indian Knowledge is an Indigenous education system of Bharat (India). Ancient civilizations were privileged to have Indian knowledge systems to preserve their own civilisations. Indian civilians learnt and transformed their knowledge without having textbooks during this period. The Indian knowledge system is a massive library concerned with the four Vedas, i.e., the Rig, Sama, Yajur, and Atharva. It covers every aspect of indigenous knowledge to preserve ancient traditions. The NEP 2020 recognises the rich heritage of ancient, eternal indigenous knowledge and thoughts as a guiding principle. The policy promotes interdisciplinary and transdisciplinary research on all aspects of INK. Technology is the scientific knowledge to perform tasks more efficiently. It is a scientific approach to access, explore, and engage, which could store Vedic texts, Ayurvedic treatises, and traditional art forms and philosophical works. In this paper, we will discuss an indigenous education system relevant to current trends in education.

KEYWORDS: IKS, Indigenous Knowledge, Technology, NEP 2020, and Education.

INTRODUCTION

By facilitating the digitalisation, accessibility, and worldwide reach of historical literature, customs, and cultural legacy, technology plays a critical role in maintaining and advancing the rich Indian knowledge system and guaranteeing its continuous relevance in the digital age. From simple tools for survival to intricate architectural achievements like irrigation systems and massive constructions, ancient civilizations created an applied technology to meet their requirements and enhance their quality of life. This shows their inventiveness and resourcefulness. With the opportunities for language preservation, storytelling, and community involvement in education, technology can be a potent tool for reviving and conserving indigenous knowledge and cultural practices. Oral traditions, complex writing systems, and the creation of information transmission techniques were essential in maintaining and spreading the Indian knowledge system throughout the Vedic era. IKS is a vast body of traditional wisdom of India, encompassing philosophy, science, mathematics, medicine, ecology, and culture, rooted in texts like the Vedas, Upanishads, and other classical literature (Chandel & Prashar, 2024). The evolution of the Indian knowledge system is originally linked to various religious literacy sources, such as Brahmanical, Buddhist, and Jain texts.

History tells us that most of the manuscript writing in Sanskrit was primarily written on birch bark and palm leaves. These old Sanskrit texts were found throughout India. Vedic tradition is classified among four Vedas, viz., Rig, Yajur, Sama and Atharva, which comprise prayer, ritual, music and methodological stories in teaching.

Ancient education was earlier known as 'Gurukul' (Ashram), where a guru imparted education to students at home. The teacher was called Guru, and the students were described as Shishya. Education was mainly based on Vedic literature. This age also teaches us the guru-sishya sampradaya, spirituality and the transmission of knowledge from guru to

sishya (disciple) through chanting and memorisation techniques (Sahoo and Pattanayak, 2026). In the later Vedic period, there was a large corpus of ritual literature found, such as shrautasutras, grihyasutras, and sulvasutras, respectively, which focused on rituals in sacrifices, in the home, and, lastly, on appendices on geometry and construction.

In order to provide a comprehensive, culturally relevant, and internationally competitive education, the National Education Policy (NEP) 2020 acknowledges the value of protecting and advancing Indian Knowledge Systems (Gaur, 2024) and seeks to include them in the educational system.

Technology is a potent tool for conserving and advancing the diverse fabric of Indian Knowledge Systems (IKS) in indigenous education in the age of digital transformation, guaranteeing its applicability and accessibility for coming generations. Technology is a new way to enhance knowledge among students and share information through information and communication technology.

SIGNIFICANCE OF THE STUDY

The origin of the Indian knowledge system is rooted in the old texts and traditions. It has greatly shaped a country's spiritual and social customs, philosophical ideas and practices. The key concepts in this system are Dharma, Karma, and Moksha (Koley, 2025). These ideas form the Indian philosophy and the way of life to preserve the Indian knowledge system. They help preserve the Indian knowledge system and guide people's beliefs and actions. These concepts remain relevant today and highlight India's rich spiritual and philosophical heritage across the world. The paper examines the preservation of the Indian knowledge system and how technology promotes it in contemporary world.

OBJECTIVES OF THE STUDY

1. To study the indigenous education system and its relevance to modern-day challenges.



2. To study the role of technology in promoting the Indian knowledge system.

RESEARCH METHODOLOGY

The methodology is based on secondary data and utilises a descriptive research methodology to achieve the objectives of the study. The data has been collected from different secondary sources, including government and semi-government publications, agency websites and journals to evaluate the study.

BACKGROUND OF THE STUDY

India is a land of ancient knowledge and rich in cultural heritage. India developed earlier in education, technology, mathematics, and astronomy. Ancient Indian knowledge had grown to preserve their indigenous education as well as wisdom. The ancient texts of India, such as the Vedas, Puranas, and Upanishads, are considered to be the pillar of source knowledge. India was earlier known as Akhand Bharat (Chandel, N. & Prashar, K.K., 2024). King Samrat Ashok, who belongs to the Maurya dynasty, was the ruler. Bharat was divided during the British colonial rule, particularly in the 20th century. It typically includes modern-day India, Pakistan, Bangladesh, and sometimes even Nepal, Bhutan, Sri Lanka, and Afghanistan. The ancient Indian university Taxila (now part of Pakistan) has been described as the first university established across the globe in the 7th century BCE. The great Chinese scholar Hiuen Tzan, in his record, mentioned that the University of Taxila was at par with Nalanda and Vikramshila universities. The great grammarian author Panini and Kautilya, the minister of Chandragupta Maurya, were the main scholars of ancient Indian universities. Other universities like Mithila, Odantapuri, Vikramshila, Nadia, Ujjain, Valabhi, Jagaddala, etc. had grown during this period.

Technology is an online platform to create a better awareness and promote IKS for students. It is accessible to share database knowledge and share remarkable information within various areas at the same time. It provides access to care information that people can't afford. Technology plays a crucial role in preserving IKS by providing various tools and platforms to document, store, and disseminate traditional knowledge. While digitising, IKS holds immense potential for enhancing teacher education, digital libraries, and institutions, which face significant obstacles that hinder effective implementation. These challenges, rooted in preservation, accessibility, cultural relevance, and ethical considerations, must be addressed to ensure the successful integration of IKS into the educational framework. With the advancement of technology and the internet, online platforms have made it easier to access information and understand. Digital platforms, mobile apps, and virtual reality can be leveraged to create immersive experiences that teach IKS that resonate with younger generations. These technologies can make learning about ancient knowledge more engaging and accessible, ensuring that it remains relevant in the digital age. Many aspects of the Indian knowledge system, such as yoga, meditation, and Ayurveda, have already gained international recognition. By promoting IKS with modern technological advancements, India can not only preserve its cultural heritage but also contribute to the global knowledge system.

The National Education Policy (2020) is a comprehensive framework to designate integrated ancient Indian knowledge. It encompasses a vast array of disciplines, including Ayurveda, Sanskrit, classical art, and ancient Indian mathematics and science. NEP 2020 recognises the importance of these systems and proposes their integration into the modern curriculum. This policy aims to rejuvenate India's rich heritage while promoting a more inclusive and diverse society. NEP 2020 strongly advocates for blending technology with cultural knowledge, promoting multilingualism, digital learning, and the revival of IKS. Government strategies such as NITI Ayog's National Strategies for Artificial Intelligence identify education as a report from UGC, AICTE, NCERT, and NITI Ayog online guidelines for digital classrooms, language technology missions, and capacity-building programmes to enhance AI-driven learning environments (Priya, 2025).

Major Challenges in Integrating IKS

Definition: A wealth of information about the interactions in people and their surroundings, as well as other non-human living things, may be found in Indigenous knowledge systems, which are collections of customs, knowledge, and beliefs that have been passed down through the centuries within particular cultures.

Challenges: The digital gap, maintaining cultural sensitivity, the requirement for accessible and culturally suitable technology, language limitations, and ethical issues are some of the difficulties in integrating technology to sustain Indian knowledge systems in indigenous education.

There is a race to replace the traditional education system with the advancement of globalisation. People make it a standard status through modernisation. The social dynamics have changed and influenced teaching methodology, curriculum, and medium of instruction, as well as integrating IKS. This has led to social imperialism and cultural imperialism. In cultural imperialism, countries with higher social status dominate the societies and cultures of countries with lower social status (Singh, 2024). Cultural diversity brings both opportunities and challenges to promote IKS. The lack of awareness about Indigenous culture has led to the deprivation of our tradition, even as technology arises around the world (Tesfa, 2024).

Integrating IKS into higher education faces numerous challenges today. The current Indian education system is predominantly shaped by Western paradigms, which prioritise empirical science and technological advancement. The lack of structured and standardised curricula for IKS poses major obstacles to its inclusion and implementation of its necessities. Many educators are not adequately trained in IKS disciplines such as ancient sciences, philosophy, Ayurveda, or other traditional mathematics, making effective teaching complex and difficult.

Moreover, educational institutions lack faculty-trained teachers in IKS, and pedagogical tools appropriate for teaching ancient indigenous knowledge are the main challenges at present. There is a need for innovative and appropriate pedagogies that can effectively bridge the gap between traditional and modern educational practices, ensuring students appreciate and understand IKS within the context of contemporary education. Additionally, there is a shortage of



well-researched textbooks, digital content, and reference materials on IKS suitable for school and university levels. IKS is sometimes seen as outdated or unscientific, while others may approach it emotionally rather than academically, affecting balanced integration (Mukunde, n.d.).

The Role of Technology in Preserving the Indian Knowledge System

A wealth of cultural heritage can be found in indigenous knowledge, which is the collective wisdom, beliefs, and practices that indigenous societies have created over many generations. However, several reasons, such as environmental changes, globalisation, and the decline in knowledge keepers, put this priceless knowledge at risk of disappearing. To ensure that this traditional wisdom endures and benefits future generations, modern technology provides promising instruments and techniques for its preservation, documentation, and dissemination. The efficient use of technology to teach and preserve indigenous knowledge is examined in this article.

Through digitalisation and recording, technology plays a vital role in promoting and conserving Indian knowledge systems within indigenous education, guaranteeing the long-term preservation and accessibility of traditional knowledge for coming generations. The Internet is an online platform for recognising and promoting IKS-like documentation and preservation.

1. E-learning – E-learning or electronic learning is an online platform to host online courses, tutorials, and virtual classrooms that make learning accessible regardless of geographical location. It offers multimedia resources (videos, animations, and 3D reconstruction) to preserve oral traditions, folklore, and ancient classical arts. People from remote regions can access learning about Ayurveda, yoga, classical music, Indian philosophy, and more through platforms like SWAYAM Prabha, MOOC, NPTEL, and DIKSHA.

(i) SWAYAM Prabha - It is an initiative of the Ministry of Human Resources Development to provide 34 high-quality educational channels through DTH (Direct to Home). It is curriculum-based courses which cover diverse disciplines such as art, science, commerce, Sanskrit, social science & humanities, engineering, technology, law, medicine, etc. Technology offers a suitable platform to store these disciplines to integrate IKS for a cultural perspective.

(ii) MOOC – Massive Open Online Courses – is a free web-based distance learning programme that is designed for a large number of geographically dispersed students. It may offer certification, enhance employment opportunities, or further studies. No physical location dependence on learners through MOOCs. It will help to promote IKS with web-based distance learning to digitise into the modern period.

1. Digital libraries – Digital libraries can play a significant role in storing and digitising ancient knowledge systems on online websites to address modern technologies. Digitising oral histories, traditional practices, rituals, and native languages helps to preserve them for future generations.
2. Mobile technology – Mobile technology offers the dissemination of information quickly to a broad audience, helping raise awareness and appreciation of

indigenous cultures. Through which people come to know more authentic information about any kind of cultural activities and rituals and can understand how to adopt the knowledge properly.

3. Distance Education – Distance education, or distance learning, is a distance mode of learning. Distance education plays a significant role in sharing database information to integrate IKS where learners can't afford education, but it's possible through e-learning, correspondence education, and open education. Online platforms like Zoom, Google Classroom, Moodle, etc. help to digitise and promote IKS for future perspective and understanding.
4. Geographical Information Systems – It is also one of the most essential parts that analyses, provides documentation for, and protects sacred sites and traditional territories. Through which we can understand and explore different sources of ancient historical sites, as well as their significant role. It preserves the information, sources of a native land, and differences in the socio-cultural aspects of the inhabitants.
5. Documentation and Digitalisation: Through digitalisation and recording, technology plays a vital role in promoting and conserving Indian knowledge systems within indigenous education, guaranteeing the long-term preservation and accessibility of traditional knowledge for coming generations.

By utilising the tools of Information and Communication Technology (ICT), researchers can explore ancient texts in a scientific way to further understand and evolve within the Indian knowledge tradition. The world is growing and evolving through ICT. Community collaboration and unity are also fostered through ICT, allowing diverse groups to come together and engage in discussions relevant to Indian Knowledge Systems (Yadav & Kumar, 2025).

Approaches to this study

- Curriculum Development: Curriculum development should concentrate on developing digital archives, interactive learning platforms, and culturally relevant educational resources to successfully incorporate technology into the preservation of Indian knowledge systems within indigenous education. Additionally, digital literacy and ethical considerations should be addressed.
- Teacher Training: Teacher preparation programmes should give educators the tools they need to combine technology, traditional knowledge, and contemporary pedagogy to create a comprehensive and culturally appropriate learning environment to successfully preserve and advance Indian knowledge systems within indigenous education.
- Case Studies: Initiatives like digital archives, language learning applications, and online knowledge sharing platforms are just a few examples of how technology can be used to preserve and advance Indian Knowledge Systems (IKS) in indigenous education, supporting intergenerational learning and cultural preservation.



Relevance of IKS to Modern-Day Challenges

- **Sustainable Development:** To achieve the Sustainable Development Goals (SDGs), IKS provides insightful information about resource management, sustainable practices, community-based solutions, resource management, and conventional farming methods. Sustainable development and a sense of environmental responsibility can be fostered by incorporating this knowledge into the classroom.
- **Addressing Modern Challenges:** IKS can be modified to address modern concerns like social justice, biodiversity loss, and climate change by utilising technology. For instance, traditional medicine can offer insights into healthcare solutions, and traditional knowledge can guide sustainable farming techniques.
- **Cultural Preservation:** With the help of technology, cultural heritage may be preserved and promoted, enabling indigenous groups to take control of their stories and knowledge. Communities' social and cultural well-being can be enhanced by this, since it can cultivate a sense of pride and belonging. We can guarantee that traditional knowledge is transmitted to future generations and cultivate pride in cultural heritage by conserving and advancing IKS.
- **Intellectual Property Rights:** Technology makes it easier to record and safeguard IKS, particularly indigenous communities' intellectual property rights. This can guarantee that IKS is utilised ecologically and ethically while also preventing exploitation.

CONCLUSION

The Indian Knowledge System (IKS) represents a multidisciplinary approach that encompasses diverse fields of knowledge. Ancient educational traditions including Vedic literature, the Upanishads, and other indigenous sources of learning have played a significant role in shaping India's ethical values, cultural heritage, and philosophical outlook. However, the contemporary world is increasingly influenced by globalisation, which poses challenges to the preservation and promotion of traditional knowledge systems.

The advancement of technology has transformed the educational landscape and provided new opportunities for the preservation and dissemination of indigenous knowledge. Bridging the gap between traditional knowledge and modern education can contribute to the preservation of IKS while enhancing curricula, pedagogy, teacher training, and exchange of cultural heritage. Furthermore, the integration of technology can facilitate the documentation, promotion, and transmission of indigenous knowledge to future generations. Therefore, continued research and innovative digital initiatives are essential for strengthening and preserving the Indian knowledge system in the modern era.

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