Role of Technology in the Promotion of Indian Knowledge System in Teacher Education: A Transformative Approach under NEP 2020

[1]Bharati Salimath and *[2]Dr. Manisha N Rathod

[1, *2]Krishna School of Engineering and Technology, Drs. Kiran and Pallavi Patel Global University, Vadodara, Gujarat, India.

Abstract
Indian Knowledge System (IKS is a resource in the rich intellectual tradition combining philosophy, science, medicine, ecology, ethics, and pedagogy. National Education Policy (NEP) 2020 focuses on bringing back and incorporating IKS into contemporary learning in order to have a holistic and value-based education. Teacher education is at the forefront of this change, since teacher is the major agent of curriculum and pedagogy. In this regard, technology is an important facilitator to the conservation, diffusion, and institutionalization of IKS in the teacher education programmes. This paper discusses the role of digital platforms, ICT tools, learning management systems and online knowledge repositories in promoting IKS among pre-service and in-service teachers. Through qualitative thematic analysis and descriptive statistics, the paper examines academic literature and chosen teacher education practices. Results indicate that technology can be used to a larger extent in improving accessibility, engagement, and pedagogical innovation in IKS-based teaching education. The research finds that future-ready culturally responsive teachers should be developed through a technology-driven framework in accordance with NEP 2020.

Keywords: Indian Knowledge System, Teacher Education, Educational Technology, NEP 2020, Indigenous Knowledge.

Introduction
The Indian Knowledge System (IKS) is an aggregate and ongoing intellectual tradition that has been developing throughout the course of thousands of years. It covers a wide variety of disciplines including philosophy, mathematics, astronomy, medicine, yoga, linguistics, ecology and pedagogy. Historically, Indian education was based on experiential learning, moral growth, social responsibility and unity with nature. Nevertheless, as the models of Western education began to expand in the colonial era, the native knowledge structures were slowly pushed out of the mainstream education.

Over the past few years, there has been a renewed interest on the topic of indigenous knowledge systems in the world due to the fact that these systems are relevant in the areas of sustainable development, ecological stability, and culturally sensitive education. The literature on the subject matter emphasizes that indigenous knowledge needs to be incorporated into the official curricula to encourage contextual learning and interaction within communities (Blose and Gumbo, 2024; Singh-Pillay and Madlala, 2026). This awakening in India has been formalized by the National Education Policy (NEP) 2020, which clearly presents the case of including IKS in every tier of education.

Teacher education comes to the fore of this change since teachers influence the classroom practices, meaning of the curriculum, and involvement of the learners. Nevertheless, the majority of teacher education programmes adhere to Eurocentric pedagogical models and little indigenous epistemologies are exposed. According to scholars, teachers might not be competent and confident enough to meaningfully incorporate IKS in their teaching practice without appropriate training and professional development (Bera, 2025; Puri, 2025).

Technology has become a significant force in radically altering the education process by using digital, virtual classrooms, online learning resources, and learning systems based on artificial intelligence. Technology within the framework of IKS provides the possibility of the digitization of ancient texts, construction of interactive educational resources, and communication with the carriers of indigenous knowledge. Technology in teacher education can therefore be used to promote IKS in a systematic and scaled out way in educational institutions.

*Corresponding Author: Dr. Manisha N Rathod

< 122 >

Fig 1: Conceptual Framework

The paper will analyze how technology will support the Indian Knowledge System in teacher education in NEP 2020 (Figure 1). It examines the use of digital means and platforms that may be used to improve pedagogical innovation, professional growth, and cultural continuity in teacher training programmes.

Literature Review

Indigenization of Indigenous Knowledge Systems in formal education has been receiving growing academic interest because of its potential to enhance sustainable development, culture, and inclusive teaching methods. Blose and Gumbo (2024) had a model of incorporating IKS in technology education based on sustainable development. Their research indicates that indigenous knowledge offers locally based solutions and ought to be used in the educational activities using modern technological tools.

Blose and Ndlovu (2025) discussed how action research and action learning can facilitate the use of indigenous knowledge in technology education. They say that IKS and scientific knowledge can coexist in a technology-supported instructional system that promotes experience and participatory learning. Their article puts a lot of emphasis on the role of digital platforms in recording, sharing and authenticating indigenous knowledge practices.

According to Singh-Pillay and Madlala (2026), the legitimization of indigenous knowledge systems is the key to sustainable development and education change. They support the introduction of indigenous epistemologies in teacher education based on interdisciplinary and technology-based frameworks. In the same vein, Ogunniyi and Iwuanyanwu (2024) examined the attitudes of teachers towards using IKS to enhance STEM education and concluded that, though teachers expressed the need to embrace the use of IKS, they needed technological assistance and training to implement it effectively.

Bera (2025) investigated the role of IKS and value education in the context of NEP 2020 which transforms teacher education in the Indian setting. The paper cites the necessity of culturally grounded pedagogy and the application of online platforms to train teachers. According to Puri (2025), IKS can be defined as a transformative model of cultural continuity and academic innovation with the emphasis on the use of technology to increase the access to indigenous knowledge.

According to Sitsha (2023), a question about the incorporation of IKS into the teaching of life sciences as an ICT tool was explored and the results showed that digital technologies contribute to the increased engagement of the learners and their better perception of the context. Molise (2025) was discussing the pedagogical knowledge of teachers who could use IKS in the education of economics and underlined the significance of technology-based professional growth.

Gumbo (2026) suggested a meshed conceptual model of centring indigenous knowledge in teaching and learning in higher education using digital repositories and collaborative environment. Govender, Mudaly, and James (2016) revealed that it is necessary to involve the knowledge holders of the indigenous people in teacher training and proposed that technology could help in recording and spreading the practice. Pfaller-Rott and Biehl (2026) also put emphasis on the ecological importance of the indigenous knowledge and the applicability of the same in the creation of the sustainable future.

All these papers put in place the argument that technology is a vital aspect in the legitimization, maintenance and spread of indigenous knowledge systems and that teacher education is the most effective area of institutionalisation of IKS.

Methodology

This research design utilized a qualitative descriptive research design and was backed by thematic analysis and simple descriptive statistics. The study was aimed at investigating the role of technology in the propagation of Indian Knowledge System in the education of teachers using the secondary data.

A comprehensive literature data consisting of 32 peer-reviewed articles, policy documents, and doctoral dissertations that were published between 2016 and 2026 were collected. The sources were chosen according to IKS, teacher education, and educational technology. NVivo version 14 was used to manage and code the data and carry out a qualitative analysis. Thematic coding was performed to discover the key patterns concerning technological integration, pedagogical innovation, professional development, and dissemination of knowledge.

To measure descriptive trends, bibliographic and thematic frequencies were calculated with the help of the IBM SPSS Statistics version 29. In order to find out the most common themes and technological tools presented in the literature, frequency distribution and percentage analysis were

< 123 >

performed.

The methods of analysis, which yielded quantifiable results and thus were included in the research, were thematic coding and frequency analysis. There was no use of inferential statistics or experimental techniques since the study was an exploration and literature based research.

Results and Analysis

The thematic analysis showed that technology has a major role in the promotion of IKS in teacher education in four broad areas namely digital preservation, pedagogical innovation, professional development, and community engagement.

Table 1: Distribution of Technological Tools Used for IKS Integration in Teacher Education

Technological Tool/Platform	Purpose in Teacher Education	Frequency of Mention in Literature (%)
Learning Management Systems (Moodle, Google Classroom, SWAYAM)	Delivery of IKS-based courses, blended learning, assessment	28%
Digital Repositories & Virtual Archives	Preservation of manuscripts, videos, indigenous practices	22%
MOOCs and Online Certification Platforms	Teacher training and professional development in IKS	18%
ICT Tools (Smart Boards, Multimedia, Apps)	Interactive classroom teaching and experiential learning	14%
Artificial Intelligence & Adaptive Learning Tools	Personalized learning and content recommendation	10%
Virtual Classrooms & Video Conferencing	Interaction with IKS scholars and indigenous knowledge holders	8%
Total		100%

The findings suggest that the most common examples of technological aids used to preserve and share indigenous knowledge are digital repositories, online learning platforms, MOOCs, virtual archives. These sites enable teachers to get access to ancient texts, recorded lectures and interactive learning modules in terms of IKS. Blended learning models and learning management systems were found to be the effective resources to incorporate IKS in teacher training programs.
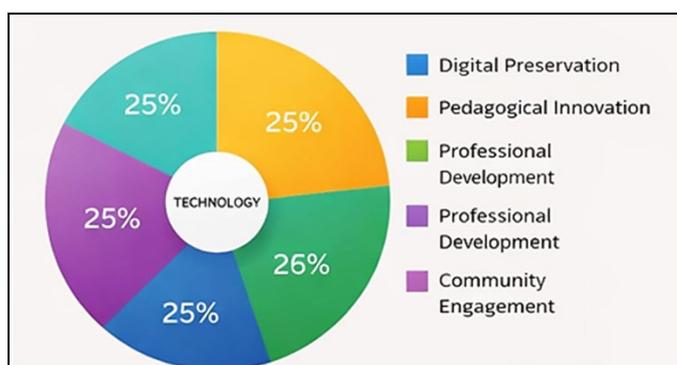
Fig 2: Thematic Distribution of IKS Integration using Technology.

It is also revealed as the analysis has demonstrated that ICT

tools can promote experience-based and inquiry-based learning through virtual field trips, simulative learning experiences, and group project learning. Such techniques are in line with Indian pedagogical principles that are traditional including experiential learning and reflective practice.

Fig 3: Online Resources to assist teacher training based on IKS.

Online-based courses of professional development were observed to improve the pedagogical competence and cultural awareness of teachers. The teachers indicated that they felt more confident when using IKS in classroom instruction with the help of digital training resources and expert webinars.

The contribution of technology in the development of connections between teachers and indigenous knowledge holders as well as with local communities was also pointed out. Online narrative, recording of video, and virtual interactive environments support oral traditions and traditions in higher education.

Fig 4: Technological application in the development of IKS professional development.

On the whole, the results indicate that technology is also a booster of institutionalizing IKS in teacher education by increasing its accessibility, engagement, and pedagogical performance.

Conclusion

Integration of Indian Knowledge System in teacher education is fundamental towards realizing the vision of NEP 2020 which is holistic, value-based and culturally-rooted. Educators are at the center of relaying knowledge, helping to shape the

< 124 >

views of learners, and help maintain their cultural flow. Nonetheless, the application of IKS in the classroom is still very minimal without systematic training and pedagogical support.

This paper brings out the transformational nature of technology in advancing IKS in the teaching education. Indigenous knowledge can be preserved, disseminated, and incorporated into the pedagogical system with the help of digital platforms, ICT tools, online repositories, and blended learning models. Technology does not only help increase access to IKS resources but also promotes experiential learning, professional development as well as community engagement.

The results indicate that IKS with the use of technology has the potential to produce culturally responsive, inclusive, and future ready teachers. Institutions of learning should thus invest in digital infrastructure, curriculum innovation and capacity-building programmes in order to institutionalize IKS in teacher education. Technology can make the Indian Knowledge System successful in modern education as a living and alive tradition by connecting the wisdom of the ancient past with the modern education.

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< 125 >