

# Study of the In-Service Training Needs of Middle School Teachers for Effective Implementation of Indian Knowledge System (IKS) in School Education

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## ABSTRACT

The integration of the Indian Knowledge System (IKS) into school education has gained renewed significance under the National Education Policy (NEP) 2020 and related curricular reforms. However, effective implementation of IKS requires teachers to possess adequate knowledge, pedagogical skills, and professional preparedness. Therefore, the present study employed a descriptive survey research design to assess the in-service training needs of middle school teachers for the effective implementation of IKS in school education. The population comprised 1418 middle school teachers teaching Classes VI–VIII in Government, Central Government, and Private schools in Bhopal, Madhya Pradesh, from which 100 teachers constituted the final sample. The respondents were selected from 13 schools using a simple random sampling technique. Data were collected using a self-developed 34-item five-point Likert-scale questionnaire comprising four constructs: awareness and understanding of IKS, IKS integration practices, challenges in IKS implementation, and training needs for IKS integration. The data were analysed using frequency, percentage, mean, and standard deviation. The findings indicated a high level of awareness and understanding of IKS and a moderate-to-high level of IKS integration practices among the respondents. Teachers reported high levels of challenges, particularly in assessing IKS-related learning outcomes, selecting appropriate pedagogical strategies, availability of resources, and managing time and curriculum requirements. The findings also revealed a high need for in-service training in areas such as IKS content knowledge, pedagogy, lesson planning, assessment strategies, ICT and digital resources, experiential and activity-based learning, interdisciplinary approaches, and the identification and use of authentic IKS resources.

Based on these findings, the study recommends the development of systematic and continuous professional development programmes on IKS for middle school teachers. Such programmes should include hands-on workshops, model lesson plans, subject-specific teaching-learning materials, authentic and locally relevant IKS resources, ICT-based learning resources, experiential activities, and appropriate assessment strategies. Regular mentoring, follow-up support, and opportunities for teachers to share classroom practices should also be incorporated to strengthen sustained implementation. It is further recommended that schools and educational authorities provide adequate institutional support and integrate IKS-related teacher development within existing Continuous Professional Development (CPD) programmes. The study concludes that curriculum and textbook reforms related to IKS need to be complemented by context-specific, sustained, and practice-oriented teacher professional development to translate policy intentions into meaningful classroom practice.

**Keywords:** Indian Knowledge System (IKS), In-service Training, Middle School Teachers, Teacher Professional Development, NEP 2020, School Education, Teacher Competencies, Curriculum Implementation.

## INTRODUCTION

The National Education Policy (NEP) 2020 aims at enhancing the holistic and multidisciplinary approach to education by bringing in the element of Indian Knowledge Systems (IKS). It is expected that through the Indian knowledge system, the indigenous knowledge and culture will be preserved while simultaneously facilitating

learner-centric education. Indian knowledge systems comprise various schools of thought like philosophy, mathematics, astronomy, Ayurveda, environmental knowledge, art, literature, and other traditional systems of Indian society. The abovementioned knowledge systems are being integrated into the National Curriculum Framework for School Education (NCF-SE) 2023 and the National Council of Educational Research and Training (NCERT) school curriculum for teaching and learning in the schools while emphasizing multidisciplinary learning. The curriculum provides an opportunity for students to learn Indian knowledge systems by including relevant pedagogical elements and content from various disciplines in teaching-learning processes. Such an approach offers a comprehensive perspective to educate the learners about the diverse range of culture, knowledge, ethical values, and practices prevailing in our country. It would support students to relate various concepts studied in different subjects with Indian knowledge systems and simultaneously promote their rational understanding.

Integrated lessons based on Indian knowledge systems could be planned by the teachers for classes VI to VIII so that the learner can develop conceptual understanding, higher-order thinking skills, and multidisciplinary approaches. Middle school is a stage in life where a learner develops complex skills like critical thinking and reasoning. Such skills can be fostered through the lessons related to Indian knowledge systems in school education. It would provide an opportunity to connect classroom concepts with Indian values and practices. It would promote deeper understanding of concepts while simultaneously making the process of learning more interesting and engaging for the learners.

To actualize the intended objectives, it is imperative that teachers need to have an appropriate understanding of disciplinary knowledge, pedagogical approaches, relevant resources for teaching, and the ability to plan and implement innovative ideas for classrooms. It makes it clear that for successful implementation of curriculum, it is important that teachers receive professional support through in-service teacher training programmes. Such programmes provide opportunities to teachers for upgrading their knowledge, update the pedagogical approaches, create useful resources for teaching, and strengthen their capacity to innovate and implement new ideas in the classrooms for achieving the desired learning outcomes. It makes it imperative that for realizing the vision of NEP 2020, continuous professional development of teachers needs to be prioritized.

## REVIEW OF RELATED LITERATURE

Several studies have explored various aspects of policy and frameworks, teacher professional development and in-service training needs, literature on Indian Knowledge Systems (IKS) in schooling, evidence from pilot programs, MOOCs, and teacher resources, challenges and critiques relevant to teacher training, international and comparative insights on indigenous knowledge in schooling, newspaper and media Coverage.

**Barnhardt, R., & Kawagley, A. O. (2005)**, these systems report improvements in student identity affirmation and engagement, with pedagogical development intensity and mentoring predicting sustainability—insights transferable to IKS in Indian middle schools.

**Kabra, G., & Jain, M. (2021); Sriprakash, A. (2012)**, empirical research consistently identifies gaps in subject-specific content knowledge and pedagogical content knowledge (PCK) at the middle school level, suggesting that IKS training must explicitly address both dimensions, including assessment literacy and integration with NCERT/SCERT learning outcomes.

**Atabek, O. (2019)**, found that insufficient teacher training, lack of content support, and poor institutional support are major barriers to effective educational integration. Although the study focused on technology integration, its findings are relevant because IKS integration also requires knowledge, pedagogy, resources, and institutional support.

**Banerjee, A., & Duflo, E. (2019)**, studies on in-service teacher education in India emphasize needs-based, context-responsive pedagogical development, sustained mentoring, and school-based communities of practice as critical for curricular reforms. These design principles are directly applicable to IKS adoption, which requires shifts in content knowledge and culturally responsive pedagogy.

**Kane et al., (2019); MHRD, (2019)**, studies on competency-based teacher standards in India and internationally suggest mapping training to observable classroom practices (planning, instruction, questioning, feedback, assessment) and using video-based coaching to build these skills

**Kumar, N., & Narayan, D. (2020); Rao, S. (2019)**, pedagogical exemplars indicate potential gains in engagement and place-based learning when teachers use local ecological knowledge and indigenous practices to contextualize science and social studies, provided teachers have access to vetted materials and assessment rubrics.

**Ministry of Education (2020)**, NEP 2020 on in-service training needs, makes CPD mandatory and insists that teachers be supported to learn new pedagogies, assessment methods, and competency-based approaches. On teacher competencies and attitudes, it frames teachers as the central agents of national educational transformation.

**AICTE–IKS (2021)**, established the IKS Division to promote research, curricula, and training resources, shaping the ecosystem of modules and materials accessible to in-service teachers and teacher educators.

**Nair, S. (2021)**, conceptual and curricular studies describe IKS as encompassing traditional sciences (e.g., Jyotiṣa/ astronomy, Ayurveda), mathematics, arts, ecological knowledge, and philosophy, advocating trans-disciplinary integration to enhance relevance, critical thinking, and cultural grounding.

**New Vision (2021)**, highlights calls for teacher up-skilling linked to school reopening and digital readiness—complementary capacity areas relevant when IKS resources are delivered via online platforms.

**Bharadwaj et al., (2022); Das et al., (2013)**, evidence from state-level in-service programs shows short, one-off workshops have limited classroom transfer, whereas iterative cycles with coaching and materials support correlate with improved instructional practice.

**Bhargava, R. (2022); Visvanathan, S. (2020)**, analyses caution that IKS in schools must be evidence-aligned, inclusive, and de-ideologized, with careful curation of resources, teacher guidance on epistemology and scientific method, and safeguards against pseudoscience. This highlights the need for training on knowledge validation, historical-contextual critique, and alignment with contemporary science standards.

**CBSE, (2022); NCERT, (2023)**, practical implementation barriers include: scarcity of age-appropriate materials in local languages; limited teacher familiarity with primary sources; alignment with existing textbooks and board exam patterns; and time constraints within overloaded syllabi.

**Chanda, I. (2022); Nanda, M. (2016); Visvanathan, S. (2020)**, scholarly commentaries warn of risks of politicization, essentialism, and the inclusion of unverified claims under the IKS banner. They advocate rigorous peer review of curricular content, teacher training on methods of historical/scientific validation, and plural representation of regional traditions.

**The Hindu Editorial (2022)**, reports that national media have covered UGC targets for teacher training in IKS and debates over curricular content, underscoring public scrutiny and the need for evidence-based teacher preparation.

**SCERT Kerala, (2022); SCERT MP, (2023)**, SCERT-led state pilots (e.g., environmental heritage modules, traditional crafts in design and technology) report positive student engagement and community linkages, with teachers requesting more grade-wise lesson banks, assessment exemplars, and vetted readings.

**Joshi, D., & Bansal, T. (2023)**, study measured awareness, attitude, and classroom behaviour regarding IKS integration of pre-service and in-service teachers. It's most important findings are that awareness was moderate, attitude was high, and actual classroom use was limited; in-service teachers were more aware than pre-service teachers; and awareness was positively correlated with behaviour. The study locates the practice gap in the lack

of curriculum-oriented materials and practical teaching strategies, and recommends textbook examples, open-source resource banks, and collaborative teacher platforms.

**Ministry of Education (2023 & 2026)**, PM SHRI guidelines and the 2026 Lok Sabha reply together show how IKS is entering the school system through flagship schools, local knowledge, vocational exposure, and revised curricular materials. PM SHRI's emphasis on local knowledge/Lok-Vidya, study of IKS, and Grades 6–8 vocational survey courses shows that middle school teachers will need integrated competencies that cut across science, mathematics, social science, arts, and work education. The 2026 parliamentary reply further confirms that implementation is active, but also implies that a more explicit school-level teacher-training framework remains underdeveloped in comparison with the higher-education IKS ecosystem.

**NCERT, (2023); CBSE, (2022)**, at the state and institutional levels, develop emerging frameworks outline curricular anchoring points (e.g., Vedic mathematics, classical astronomy, indigenous environmental knowledge), yet evidence indicates variability in teacher access to age-appropriate, standards-aligned resources for the middle school band.

**NCF-SE (2023)** and the **NCERT, Advisory for Schools** translate NEP into implementable curricular expectations. For in-service training, the advisory strongly implies that teacher preparation must address new textbooks, new pedagogies, new learning standards, and varied assessments. For teacher competencies, the demand shifts from content coverage to conceptual understanding, critical thinking, creativity, and values/dispositions. For curriculum integration, the Framework explicitly recognizes “Rootedness in India and Indian Knowledge Systems,” while the advisory ties reform to actual textbook rollout. For implementation, the documents make clear that IKS is no longer peripheral; it is part of the redesign of classroom teaching itself. For resources, NCERT's textbook and LTM ecosystem become the core implementation infrastructure.

**The UGC's (2023)**, IKS training/orientation guidelines are the most explicit competency blueprint currently available. They argue that the main purpose of training is to generate informed interest and a positive orientation toward IKS, not indiscriminate content loading. They insist on authenticity and peer review of source materials, regional-language access, field visits, and pedagogical innovation. They also propose a staged implementation roadmap with master-teacher preparation, nodal centres, induction modules, and refresher courses.

**UGC, (2023); AICTE-IKS, (2022)**, early-stage program notes from AICTE-IKS and UGC highlight MOOCs and short certificate courses introducing IKS themes to educators. Evaluations (where available) show high enrolment but mixed completion and uneven classroom translation without local facilitation or mentoring.

**Sharma, R., & Maheshwari, E. (2024)**, argues that IKS can deepen conceptual understanding and strengthen cultural connection, but also warns that orally transmitted traditions require careful validation, age-appropriate adaptation, and teacher pedagogical preparation. The paper's central message is that teacher training is “paramount” if IKS is to be integrated effectively into existing school systems.

**CIET (2025)**, The NISHTHA portal shows the scale and structure of India's current teacher-development machinery. India has a functioning platform architecture through which IKS-focused upper-primary or middle-stage modules could be delivered, tracked, and scaled.

**RIE AJMER (2025)**, the NSIHKSSC-2025 seminar brochure is valuable because it functions as an official problem map for the field. The seminar themes include curriculum design, pedagogical integration, subject-wise IKS, multi-disciplinary, teacher preparedness, resource development, and policy implementation strategies.

**Singh, S., Tigga, A. A., & Kumar, R. (2025)**, published in the Indian Journal of Teacher Education and indexed through the NCTE-hosted journal issue, this mixed-design study used questionnaires with 125 prospective teachers and semi-structured interviews with 11 teacher educators. It found that participants were positive and confident about integrating IKS into teacher education, but reported barriers in epistemic understanding, support systems, classroom application, reading resources, and interaction with experts. Its recommendation resource development and curricular strengthening has immediate relevance to school in-service training because middle school teachers will face the same need to move from belief to enactment.

## Research Gap

Although NEP 2020, NCF-SE 2023, NCERT textbooks, PM SHRI guidelines, and UGC guidelines advocate for the inclusion of Indian Knowledge System (IKS) in education, there is a lack of research on its implementation by middle-level teachers. Most relevant studies explore the role of IKS in higher education, teacher education, pre-service teachers, or general awareness or attitudes towards IKS. Recent NCERT textbooks (Poorvi, Curiosity, Ganita Prakash) and social science textbooks contain more content related to Indian culture, traditional knowledge, Indian heritage, values, local environment, and intellectual traditions. However, mere inclusion in textbooks does not guarantee successful implementation. Teachers need the necessary awareness, competencies, and resources such as teaching-learning materials with indigenous examples and analogies for appropriate IKS incorporation into teaching and learning processes.

Thus, there is a research gap about the readiness, level of competencies, training needs, problems, and subject-specific peculiarities of IKS implementation among middle-level school teachers. In addition, there is a lack of investigation on the most relevant and efficient in-service training methods (e. g., workshops, mentoring, activity-based training, etc.) for teachers of different subjects, ways to assess the efficacy of training, relevant lesson plans, teaching resources, assessment tools, and other supportive measures for successful IKS implementation. Therefore, the current study aims to assess awareness, practice, problems, competencies, and in-service training needs of middle-level teachers regarding the successful inclusion of IKS in school education.

## Need of the Study

The need for the present study arises from the intersection of three developments: first, the policy-level integration of IKS under NEP 2020; second, the curricular embedding of IKS in new NCERT middle-stage textbooks; and third, the reality that classroom implementation depends on teachers' professional readiness. These three developments together create a clear need for a focused, empirical understanding of what middle school teachers actually require in order to implement IKS meaningfully.

NCERT's 50-hour continuous professional development (CPD) guideline suggesting teachers to explore their own professional development needs through online courses and training modules. However, the general CPD guidelines do not explicitly state the training needs related to effective incorporation of Indian knowledge system (IKS) in school curricula. Teachers may need to acquire specific knowledge and skills for effective teaching of IKS elements in school education such as understanding concepts, culturally responsive pedagogy, interdisciplinary teaching and learning; treating culture and heritage appropriately in relation to learners' age; addressing language-related aspects and assessment. According to UNESCO, a systematic assessment of teachers' training needs contributes to the design of relevant in-service training programs.

## Objectives of the Study

- A. To examine the level of awareness and understanding of the Indian Knowledge System (IKS) among middle school teachers.
- B. To study the extent to which middle school teachers integrate IKS into their classroom teaching practices.
- C. To identify the challenges encountered by middle school teachers in implementing IKS into school education.
- D. To identify the areas of professional competence in which middle school teachers require in-service training for effective integration of the Indian Knowledge System (IKS) in school education.

## Research Questions

- A. What is the level of awareness and understanding of the Indian Knowledge System (IKS) among middle school teachers?
- B. To what extent is the Indian Knowledge System (IKS) integrated into classroom teaching practices by middle school teachers?

- C. What challenges do middle school teachers encountered in implementing the Indian Knowledge System (IKS) in school education?
- D. What areas of professional competence do middle school teachers identify as requiring in-service training for effective integration of the Indian Knowledge System (IKS) in school education?

### Limitation of the Study

- A. The study was confined to middle school teachers (Classes VI–VIII) working in government, central government, and private schools in **Bhopal district, Madhya Pradesh**; therefore, the findings may not be generalizable to other regions.
- B. The study employed a **descriptive survey research design** and relied on a self-developed questionnaire for data collection.
- C. The findings were based on teachers' self-reported responses, which may have been influenced by personal perceptions and response bias.
- D. The study focused only on teachers' awareness, classroom practices, implementation challenges, and in-service training needs related to the Indian Knowledge System (IKS). It did not include the perspectives of students, school heads, teacher educators, or policymakers.
- E. The study was conducted during the academic session **2025–2026**, and therefore reflects the context of the initial implementation phase of IKS under NEP 2020 and the revised NCERT curriculum.

### Delimitation of the Study

- A. The study is restricted to middle schools situated in Bhopal district, Madhya Pradesh.
- B. The participants of the study are limited to middle school teachers teaching Classes VI to VIII.
- C. The study is confined to examining the in-service training needs of middle school teachers for the effective implementation of the Indian Knowledge System (IKS) in school education.
- D. The study does not include the perspectives of students, school heads, teacher educators, curriculum developers, policymakers, or parents, as it focuses exclusively on middle school teachers.

## RESEARCH METHODOLOGY

### Research Design

The present study adopted a **descriptive research design** to investigate the in-service training needs of middle school teachers for the effective implementation of the Indian Knowledge System (IKS) in school education. The descriptive research design was considered appropriate because the study aimed to describe and assess the existing awareness and understanding of IKS, its integration practices, challenges faced by teachers, and their specific training needs without manipulating any variables. The study focused on teachers teaching Classes VI–VIII in the subjects of Science, Mathematics, English, Social Science, Hindi, and Geography.

For the purpose of the study, a **self-developed questionnaire consisting of 34 statements based on a five-point Likert scale** was used. The questionnaire comprised four major dimensions: **(i) Awareness and Understanding of IKS (8 items)**, **(ii) IKS Integration Practices in Teaching (8 items)**, **(iii) Challenges in IKS Implementation (8 items)**, and **(iv) Training Needs for IKS Integration (10 items)**. The responses were recorded on a five-point scale ranging from Strongly Agree to Strongly Disagree.

## Population and Sample

The population of the study consisted of **1418 middle school teachers** teaching Classes VI–VIII in Government, Central Government, and Private schools in Bhopal, Madhya Pradesh. The teachers included in the population were those teaching Science, Mathematics, English, Social Science, Hindi, and Geography.

A sample of **117 middle school teachers** was selected from the identified population. The sample was drawn from 13 selected schools representing different school management categories. The school-wise distribution of the population/sample frame is presented below.

| S. No.       | Name of School                             | No. of Eligible Teachers |
|--------------|--------------------------------------------|--------------------------|
| 1            | Demonstrative Multipurpose School, Bhopal  | 11                       |
| 2            | Kendriya Vidyalaya No. 1                   | 9                        |
| 3            | Kendriya Vidyalaya No. 2                   | 8                        |
| 4            | Kendriya Vidyalaya, Bairagarh              | 11                       |
| 5            | Kasturba Gandhi Balika Vidyalaya, TT Nagar | 7                        |
| 6            | Subhash Excellence                         | 12                       |
| 7            | Kamala Nehru Government Girls School       | 8                        |
| 8            | Shaskiya Madhyamik Shala, New Jail         | 8                        |
| 9            | Government High School, 25th Battalion     | 8                        |
| 10           | Government Naveen High School              | 9                        |
| 11           | St. Joseph's Co-ed School                  | 10                       |
| 12           | Jawaharlal Nehru School                    | 7                        |
| 13           | Kendriya Vidyalaya No. 3, Bagmugaliya      | 9                        |
| <b>Total</b> |                                            | <b>117</b>               |

Out of the 117 eligible teachers, **100 teachers provided valid responses**, which were included in the final analysis. The respondents represented Government, Central Government, and Private school settings, thereby providing representation from different types of school management.

## Demographic Characteristics of the Teachers

To describe the background characteristics of the respondents, demographic information was collected through Section A of the questionnaire. The demographic variables included **gender, age, educational qualification, teaching experience, type of school, and subject taught**. These variables were considered relevant because teachers' professional background, teaching experience, subject specialization, and school context may influence their awareness, practices, challenges, and training requirements related to IKS.

The demographic characteristics of the 100 respondents should be presented through frequency and percentage distributions.

| Demographic Variable | Categories                                                      |
|----------------------|-----------------------------------------------------------------|
| Gender               | Male, Female, Other                                             |
| Age                  | Below 30, 30–40, 41–50, Above 50                                |
| Qualification        | B.Ed., M.Ed., M.Phil., Ph.D., Other                             |
| Teaching Experience  | Below 5 years, 6–10 years, 11–20 years, Above 20 years          |
| Type of School       | Government, Aided, Private                                      |
| Subject Taught       | Science, Mathematics, English, Social Science, Hindi, Geography |

## Sampling Technique

The study employed a **simple random sampling technique** for selecting the respondents from the identified population. First, the researcher identified 13 schools in Bhopal representing Government, Central Government, and Private school categories. The total number of eligible middle school teachers in these schools was identified

as **117**. The list of eligible teachers was prepared based on the inclusion criteria, namely teachers teaching Classes VI–VIII in the selected subjects. Teachers were selected using a random selection procedure so that each eligible teacher had an equal opportunity of being selected for participation in the study. The selected teachers were approached and invited to participate in the study. A total of **100 completed and valid questionnaires** were obtained and retained for final analysis.

The school-wise sampling frame consisted of 117 teachers, distributed across the 13 selected schools. The number of eligible teachers varied from **7 to 12 teachers per school**. This approach provided coverage across the different school settings included in the study and reduced the possibility of personal selection bias.

### Data Collection Procedure

The data collection process was carried out systematically to ensure the accuracy, consistency, and confidentiality of the information obtained. Initially, the researcher obtained permission from the concerned authorities of the selected institutions. The purpose and significance of the study were explained to the participating teachers before administering the questionnaire. The respondents were informed that their participation was voluntary and that the information provided by them would be kept confidential and used solely for academic research purposes.

The researcher provided clear instructions regarding the completion of the questionnaire. The questionnaire was administered through **offline mode**, depending on the convenience and accessibility of the respondents. The respondents were given sufficient time to understand and complete the 34-item questionnaire. After collection, each completed questionnaire was carefully scrutinized for completeness and consistency. Questionnaires with incomplete or unusable responses were excluded from the final dataset.

The valid responses were subsequently **coded, tabulated, and organized for statistical analysis**. A total of **100 valid questionnaires** were obtained and used for the final analysis and interpretation in accordance with the objectives of the study.

### Data Analysis and Interpretation

This section walks through the results objective by objective. For each dimension, the statement wise statistical scores are presented first, followed by a plain-language explanation of what the numbers actually mean for in-service teachers' training needs of middle school teachers' for effective implementation of IKS.

#### Objective 1 - Awareness and Understanding of IKS

**TABLE- 1: Mean and Standard Deviation of Teachers' Awareness and Understanding of Indian Knowledge System (IKS)**

| Sl. No.  | STATMENT                                                                                                                                           | MEAN        | STANDARD DEVIATION |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------|
| <b>1</b> | The concept of the Indian Knowledge System (IKS) is well understood.                                                                               | <b>4.04</b> | <b>1.20</b>        |
| <b>2</b> | The objectives of integrating IKS into school education are clearly understood.                                                                    | <b>3.84</b> | <b>1.14</b>        |
| <b>3</b> | Awareness of the recommendations of the National Education Policy (NEP) 2020 related to IKS is adequate.                                           | <b>4.04</b> | <b>0.77</b>        |
| <b>4</b> | Awareness of IKS-related content included in middle school textbooks is adequate.                                                                  | <b>4.12</b> | <b>1.16</b>        |
| <b>5</b> | Different dimensions of IKS, such as traditional knowledge, indigenous practices, Indian sciences, arts, culture, and values, are well understood. | <b>3.72</b> | <b>1.43</b>        |

|   |                                                                                        |      |      |
|---|----------------------------------------------------------------------------------------|------|------|
| 6 | Awareness of authentic sources and learning resources related to IKS is adequate.      | 3.86 | 1.20 |
| 7 | The educational significance of IKS in promoting holistic learning is well understood. | 3.88 | 1.07 |
| 8 | Awareness of the relevance of IKS for middle school teaching is adequate.              | 3.92 | 1.02 |

The findings indicate a **high level of awareness and understanding of IKS** among middle school teachers. The highest mean was reported for awareness of IKS-related content in textbooks ( $M = 4.12$ ,  $SD = 1.16$ ), followed by understanding of IKS and awareness of NEP 2020 recommendations ( $M = 4.04$  each). However, understanding of the diverse dimensions of IKS, including traditional knowledge, indigenous practices, Indian sciences, arts, culture, and values, was comparatively lower ( $M = 3.72$ ,  $SD = 1.43$ ).

This finding is broadly consistent with **Joshi and Bansal (2023)** and **Singh et al. (2025)**, who reported positive awareness and attitudes towards IKS but also identified gaps in deeper conceptual understanding and practical preparedness. The findings suggest that teachers are increasingly familiar with IKS due to policy and curricular reforms under **NEP 2020**, but general awareness does not necessarily imply adequate pedagogical competence. Therefore, teachers require **systematic professional development** to deepen their understanding of IKS and effectively translate it into classroom practice.

## Objective 2 - IKS Integration Practices in Teaching

**TABLE-2: Mean and Standard Deviation of Teachers' IKS Integration Practices in Classroom Teaching**

| SL. NO. | STATEMENT                                                                                                        | MEAN | STANDARD DEVIATION |
|---------|------------------------------------------------------------------------------------------------------------------|------|--------------------|
| 1       | Indian Knowledge System (IKS) concepts are integrated into classroom teaching whenever relevant.                 | 4.58 | 0.60               |
| 2       | Examples from Indian knowledge, traditions, and local culture are incorporated during classroom teaching.        | 4.52 | 0.64               |
| 3       | Teaching-learning activities are designed to connect subject content with IKS.                                   | 4.70 | 0.54               |
| 4       | Experiential learning approaches are used to integrate IKS into classroom teaching.                              | 4.38 | 0.69               |
| 5       | Local and indigenous knowledge is included while explaining subject concepts.                                    | 4.42 | 0.80               |
| 6       | Classroom discussions encourage students to relate school learning with Indian knowledge and cultural practices. | 4.08 | 1.13               |
| 7       | Teaching-learning materials containing IKS content are used during classroom instruction.                        | 4.10 | 0.94               |
| 8       | Opportunities are provided for students to explore and apply IKS in classroom activities and projects.           | 4.18 | 0.91               |

The findings reveal a **high level of IKS integration in classroom practices**. Teachers reported strong use of IKS-connected teaching-learning activities ( $M = 4.70$ ,  $SD = 0.54$ ), integration of IKS concepts when relevant ( $M = 4.58$ ,  $SD = 0.60$ ), and incorporation of Indian knowledge, traditions, and local culture ( $M = 4.52$ ,  $SD = 0.64$ ). Experiential learning and the use of local and indigenous knowledge were also reported at high levels. However, relatively lower scores for the use of IKS-based teaching-learning materials ( $M = 4.10$ ), classroom discussions ( $M = 4.08$ ), and student activities/projects ( $M = 4.18$ ) suggest scope for more systematic implementation.

The findings broadly support **Joshi and Bansal (2023)**, who reported a positive relationship between IKS awareness and classroom practices, while **Singh et al. (2025)** highlighted limitations related to resources and

classroom application. The present findings indicate that teachers are already making efforts to integrate IKS, but its implementation may remain largely informal through examples and contextual references. Therefore, **structured teaching-learning materials, activity-based strategies, lesson models, and professional support** are needed to strengthen systematic and meaningful IKS integration in classrooms.

### Objective 3 - Challenges in IKS Implementation

**TABLE- 3: Mean and Standard Deviation of Challenges Faced by Teachers in Implementing Indian Knowledge System (IKS)**

| SL. No. | STATEMENT                                                                                                              | MEAN | STANDARD DEVIATION |
|---------|------------------------------------------------------------------------------------------------------------------------|------|--------------------|
| 1       | Limited knowledge of appropriate pedagogical strategies creates difficulty in integrating IKS into classroom teaching. | 4.36 | 1.04               |
| 2       | Insufficient guidance in the school curriculum makes IKS integration difficult.                                        | 4.34 | 0.71               |
| 3       | Limited availability of teaching-learning materials hinders the effective integration of IKS.                          | 4.40 | 0.69               |
| 4       | Lack of institutional support affects the implementation of IKS in classroom teaching.                                 | 4.22 | 0.94               |
| 5       | Time constraints within the existing curriculum make IKS integration challenging.                                      | 4.42 | 0.85               |
| 6       | Limited opportunities for professional training create challenges in integrating IKS effectively.                      | 4.46 | 0.70               |
| 7       | Difficulty in assessing students' learning outcomes related to IKS affects classroom implementation.                   | 4.54 | 0.78               |
| 8       | Lack of access to authentic IKS resources and reference materials limits effective classroom integration.              | 4.20 | 0.72               |

The results indicate that middle school teachers face **considerable challenges in implementing IKS**, with all eight challenge areas showing high mean scores. The major challenge was assessing students' IKS-related learning outcomes ( $M = 4.54$ ,  $SD = 0.78$ ), followed by limited professional training opportunities ( $M = 4.46$ ,  $SD = 0.70$ ), time and curriculum constraints ( $M = 4.42$ ,  $SD = 0.85$ ), inadequate teaching-learning materials ( $M = 4.40$ ,  $SD = 0.69$ ), and limited pedagogical knowledge ( $M = 4.36$ ,  $SD = 1.04$ ). These findings indicate that teachers need support in **assessment, pedagogy, resources, and curriculum integration**.

The findings are consistent with **Singh et al. (2025)**, who identified inadequate resources, support systems, and difficulties in classroom application as important barriers to IKS integration. Similarly, **Atabek (2019)** highlighted the role of inadequate training, resources, and institutional support in creating difficulties in implementing new educational practices. The present study further shows that although teachers report relatively high levels of IKS-related classroom practices, they continue to face challenges in implementing IKS systematically. This suggests the need for **continuous professional development, authentic teaching resources, practical pedagogical guidance, and appropriate assessment strategies** to support effective IKS implementation.

### Objective 4 - Training Needs for Effective IKS Integration

**TABLE- 4: Mean and Standard Deviation of Teachers' Training Needs for Effective Integration of Indian Knowledge System (IKS)**

| SL. No. | STATEMENT                                                                                          | MEAN | STANDARD DEVIATION |
|---------|----------------------------------------------------------------------------------------------------|------|--------------------|
| 1       | Training is required to strengthen content knowledge related to the Indian Knowledge System (IKS). | 4.24 | 0.86               |

|    |                                                                                                                  |      |      |
|----|------------------------------------------------------------------------------------------------------------------|------|------|
| 2  | Training is needed to develop pedagogical strategies for integrating IKS into classroom teaching.                | 4.36 | 0.71 |
| 3  | Training is required to design IKS-based lesson plans and learning experiences.                                  | 4.32 | 0.70 |
| 4  | Training is needed to develop and use IKS-based teaching-learning materials effectively.                         | 4.22 | 0.70 |
| 5  | Training is required to integrate ICT tools and digital resources for teaching IKS.                              | 4.40 | 0.66 |
| 6  | Training is needed to use experiential and activity-based learning approaches for IKS integration.               | 4.38 | 0.63 |
| 7  | Training is required to adopt appropriate assessment techniques for evaluating learning outcomes related to IKS. | 4.42 | 0.80 |
| 8  | Training is needed to integrate IKS across different school subjects through interdisciplinary approaches.       | 4.24 | 0.74 |
| 9  | Training is required to incorporate local and indigenous knowledge into classroom teaching.                      | 4.20 | 0.77 |
| 10 | Training is needed to identify and use authentic IKS resources and reference materials for classroom teaching.   | 4.32 | 0.76 |

The findings reveal a **high level of in-service training needs** among middle school teachers across all ten areas. The highest need was reported for **assessment of IKS-related learning outcomes** ( $M = 4.42$ ,  $SD = 0.80$ ), followed by ICT and digital resources ( $M = 4.40$ ,  $SD = 0.66$ ), experiential and activity-based learning ( $M = 4.38$ ,  $SD = 0.63$ ), pedagogical strategies ( $M = 4.36$ ,  $SD = 0.71$ ), and IKS-based lesson planning ( $M = 4.32$ ,  $SD = 0.70$ ). Teachers also expressed strong needs for authentic IKS resources, teaching-learning materials, interdisciplinary approaches, and local and indigenous knowledge.

These findings support **Singh et al. (2025)**, who reported that positive attitudes towards IKS do not necessarily ensure adequate preparedness for classroom implementation due to gaps in knowledge, resources, and practical support. The findings are also aligned with **NEP 2020** and UGC guidelines, which emphasize continuous professional development, experiential learning, assessment, pedagogy, and effective integration of IKS into teaching. The strong demand for ICT and activity-based training further indicates the need for **practical, technology-supported, and classroom-oriented professional development** rather than only theoretical orientation.

Notably, the highest training need for assessment corresponds directly with the major challenge identified in Objective 3 ( $M = 4.54$ ). This consistency indicates that teachers' training requirements are closely linked to their actual classroom difficulties. Therefore, IKS professional development programmes should particularly focus on **assessment strategies, pedagogy, lesson planning, experiential learning, ICT, and authentic resource utilization** to strengthen teachers' capacity for effective IKS implementation.

## FINDINGS

### Findings Related to Objective 1

The findings revealed a **high level of awareness and understanding of IKS** among middle school teachers. Teachers showed particularly high awareness of IKS-related textbook content and NEP 2020 provisions, whereas understanding of the wider dimensions of IKS was comparatively lower. This indicates that teachers may be increasingly familiar with IKS as a policy and curricular concept, but their deeper conceptual understanding is still developing.

This finding is consistent with **Singh et al. (2025)**, who found that prospective teachers and teacher educators generally recognized the relevance of IKS but reported limitations in their deeper understanding and practical

exposure. Similarly, **Sahoo and Pradhan (2026)** reported positive perceptions towards IKS among pre-service teachers, but found relatively limited cognitive awareness and readiness for classroom implementation. The present study differs in that the respondents were **in-service middle school teachers**, who demonstrated comparatively higher awareness. This difference may be attributed to their professional experience and increasing exposure to NEP 2020 and recent curricular reforms. Thus, the findings suggest that **policy-level awareness is increasing, but deeper epistemological and pedagogical understanding requires further professional development.**

### Findings Related to Objective 2

The findings showed a **high level of reported IKS integration practices**. Teachers frequently connected subject content with IKS, used Indian knowledge and local cultural examples, and incorporated experiential approaches. However, comparatively lower scores for the use of IKS-based teaching-learning materials, student projects, and structured classroom discussions indicate that integration may not yet be fully systematic.

The finding agrees with **Joshi and Bansal (2023)**, who reported a positive relationship between teachers' awareness of IKS and their classroom practices. However, their findings also indicated limitations in translating awareness into consistent classroom implementation. The present study shows comparatively stronger reported classroom integration, which may be explained by the fact that the respondents were practising teachers exposed to recent curricular changes. **Singh et al. (2025)** similarly identified classroom application and resource availability as areas requiring greater support. In addition, **Nayak (2025)** emphasized curriculum redesign, pedagogical innovation, resource development, and teacher preparation as important conditions for meaningful IKS integration. Thus, the present findings indicate that teachers have begun integrating IKS, but structured resources, subject-specific examples, lesson plans, and activity-based pedagogies are required to move from informal inclusion to systematic integration.

### Findings Related to Objective 3

The findings demonstrated that teachers experience **high levels of challenges** in implementing IKS. The major difficulties were assessing IKS-related learning outcomes, limited professional training, curriculum and time constraints, inadequate teaching-learning materials, and insufficient pedagogical knowledge. These findings indicate that the major barriers are not related only to teachers' willingness to adopt IKS but also to the availability of professional, curricular, and institutional support.

The findings are strongly supported by **Singh et al. (2025)**, who identified inadequate resources, limited support, and difficulties in classroom application as important concerns in IKS integration. Similarly, **Agrawal and Kag (2025)** identified poor teacher training, curriculum integration problems, and resource-related issues as major obstacles to embedding IKS within contemporary education. **Kanojiya and Sankpal (2025)** also highlighted inadequate digital literacy and institutional frameworks as challenges in connecting IKS with contemporary educational practices. The consistency across these studies suggests that the challenges identified in the present study are not isolated to Bhopal but reflect broader implementation issues. Therefore, effective IKS implementation requires **teacher training, appropriate resources, curricular clarity, institutional support, and suitable assessment mechanisms.**

### Findings Related to Objective 4

The findings revealed a **high level of in-service training needs** among middle school teachers. The greatest need was reported for assessment of IKS-related learning outcomes, followed by ICT and digital resources, experiential and activity-based learning, pedagogical strategies, lesson planning, and authentic IKS resources. The findings indicate that teachers require **practical and classroom-oriented training rather than only theoretical awareness programmes.**

This finding is consistent with **Singh et al. (2025)**, whose study emphasized the need for stronger practical preparation, resources, and support for IKS integration. It also agrees with **Sahoo and Pradhan (2026)**, who recommended structured curricula, practical training, and pedagogical support because positive attitudes alone

did not ensure classroom readiness. The present findings are further supported by the **UGC (2023)** guidelines, which emphasize faculty familiarization with IKS and the development of strategies for incorporating IKS into specific classroom teaching. **Nayak (2025)** similarly emphasized teacher preparation, pedagogical innovation, resource development, and assessment as essential components of IKS integration.

The particularly high need for **assessment training** corresponds directly with the finding under Objective 3 that assessment was the most prominent implementation challenge. This agreement between the challenge and training-needs findings strengthens the internal consistency of the study. Therefore, IKS professional development programmes should focus on **assessment strategies, lesson planning, experiential learning, ICT, authentic resource selection, interdisciplinary teaching, and classroom pedagogy**.

### Educational Implications

The findings of the study carry important implications for teacher education, curriculum planning, and school leadership.

1. Teacher training programmes should move beyond general orientation and provide competency-based in-service modules specifically focused on IKS implementation.
2. Assessment literacy should become a priority area, since teachers identified evaluation of IKS-related learning as their greatest difficulty.
3. Practical pedagogy is essential; teachers need subject-wise examples, model lesson plans, and activity designs rather than abstract policy explanations alone.
4. Resource support should be strengthened through teacher handbooks, curated digital repositories, classroom materials, and access to authentic reference sources.
5. Institutional support from school leadership is necessary to create time, encouragement, and collaborative opportunities for IKS integration.
6. ICT-enabled professional development may help scale IKS training efficiently, especially where in-person support is limited.

### CONCLUSION

The use of Indian Knowledge System (IKS) in the school education as recommended by National Education Policy (NEP) 2020 and National Curriculum Framework for School Education (NCF-SE) 2023 creates an additional responsibility for middle level school teachers. The results of the study point that the awareness of the participants regarding the use of IKS is positive but it has not been effectively incorporated into mainstream teaching practice due to insufficient conceptual clarity, pedagogical knowledge, and instructional material, and lack of proper guidance. The study has emphasized the need for conducting need based in-service training for the middle level teachers in order to strengthen their knowledge of Indian Knowledge System, interdisciplinary pedagogical understanding and teaching learning strategies, classroom instructions, assessment practices, and use of local resources and digital material. The study suggests that in-service training of the teachers in Indian Knowledge System should be conducted for enhancing their confidence and competence for effective transaction of knowledge in different areas of learning. The findings of the study therefore conclude that the success of using IKS in school education depends on the continuous in-service training of the teachers in order to upgrade their knowledge and skills in IKS and related areas. The policymakers, curriculum planners, teacher trainers, and other education professionals need to take initiative for designing and organizing effective in-service training programmes based on the training needs of the middle level school teachers. These efforts would ultimately help to achieve the goals set in the NEP 2020 and provide quality education to the school children.

### RECOMMENDATIONS

1. Structured in-service training programmes on IKS should be organized regularly for middle school teachers.

2. Training should focus on assessment strategies, pedagogical approaches, lesson planning, ICT integration, and experiential learning.
3. Curriculum-aligned IKS teaching-learning materials, teacher handbooks, and digital resource banks should be developed and supplied to schools.
4. School administrators should encourage collaborative planning, innovation, and community-based learning related to IKS.
5. Teacher education institutions should strengthen both pre-service and in-service engagement with IKS through demonstration lessons, workshops, and practical modules.
6. Future research should test the effectiveness of specific IKS training programmes and examine their impact on classroom teaching and student learning.

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