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## Integrating Indian Knowledge Systems in Teacher Education: Examining Pre-Service Teachers Awareness, Attitude and Readiness for Classroom Practice

Parshuram Sahoo<sup>1\*</sup>, Jyoti Sankar Pradhan<sup>2</sup>

<sup>1</sup>Dharanidhar University, Odisha, India

<sup>2</sup>Fakir Mohan University, Odisha, India

\*<sup>1</sup>Email : [sahoo.parshuram3@gmail.com](mailto:sahoo.parshuram3@gmail.com)

<sup>2</sup>Email : [pradhannjs@gmail.com](mailto:pradhannjs@gmail.com)

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### ABSTRACT

Amid growing emphasis on integrating Indian Knowledge Systems (IKS) into education and implementing the National Education Policy 2020, understanding pre-service teachers' perceptions of IKS integration has become essential. This study examined the inclusion of IKS in teacher education across cognitive, affective, and behavioural dimensions. A mixed-methods convergent parallel design was employed. Quantitative data were collected from 150 pre-service teachers through a 15-item Likert-scale questionnaire, while qualitative insights were obtained from semi-structured interviews with 12 participants. Descriptive statistics and thematic analysis were used to analyse the data. Findings revealed moderate to strong positive perceptions toward IKS integration, with the affective dimension showing the strongest responses. However, cognitive and behavioural dimensions indicated limited awareness and low readiness to implement IKS. Qualitative findings supported these results, highlighting positive attitudes but limited experience and confidence in practice. The study underscores the need for structured curricula, practical training, and pedagogical support in teacher education programs.

### Keywords:

Indian Knowledge System, Teacher Education, Pre-service Teachers, Mixed Methods Research

### ABSTRAKS

Seiring meningkatnya penekanan terhadap integrasi Indian Knowledge Systems (IKS) dalam pendidikan serta penerapan National Education Policy 2020, pemahaman mengenai persepsi calon guru terhadap integrasi IKS menjadi sangat penting. Penelitian ini mengkaji integrasi IKS dalam pendidikan guru berdasarkan dimensi kognitif, afektif, dan perilaku. Penelitian menggunakan pendekatan mixed methods dengan desain convergent parallel. Data kuantitatif diperoleh dari 150 calon guru melalui kuesioner skala Likert berisi 15 butir, sedangkan data kualitatif diperoleh melalui wawancara semi terstruktur dengan 12 peserta. Analisis data dilakukan menggunakan statistik deskriptif dan analisis tematik. Hasil menunjukkan persepsi positif sedang hingga tinggi terhadap integrasi IKS, dengan dimensi afektif sebagai aspek terkuat. Namun, dimensi kognitif dan perilaku menunjukkan rendahnya pemahaman serta kesiapan implementasi IKS. Temuan kualitatif mendukung hasil tersebut dengan menunjukkan sikap positif tetapi pengalaman dan kepercayaan diri praktik yang masih terbatas. Penelitian ini menekankan pentingnya kurikulum terstruktur, pelatihan praktis, dan dukungan pedagogis dalam program pendidikan guru secara berkelanjutan dan menyeluruh

### Kata Kunci:

Sistem Pengetahuan India, Pendidikan Guru, Calon Guru, Penelitian Metode Campuran

## 1. Introduction

In recent times, there has been a greater emphasis on the inclusion of Indian Knowledge Systems (IKS) in formal education, which reflects a greater recognition of indigenous epistemologies and culture-based approaches to teaching and learning. Indian Knowledge Systems refer to a vast and ever-evolving body of knowledge based on philosophical, scientific, and ecological principles, as well as community-based approaches that have evolved over time. In contrast to the reductionist and compartmentalized approaches to knowledge, which are characteristic of modern education, Indian Knowledge Systems provide a holistic framework that

connects cognitive, moral, spiritual, and practical dimensions of learning. Such a holistic approach to learning is considered vital to respond to the educational challenges of the 21st century, where learners not only require cognitive competence but also cultural embeddedness, morality, and contextual awareness. In this context, the inclusion of Indian Knowledge Systems in teacher education appears to be of vital importance, as it seeks to prepare teachers to deal with diverse approaches to knowledge and adopt approaches to teaching that are not only meaningful but also relevant to the context (Kumar, 2022; UNESCO, 2022). The significance of IKS in teacher education becomes clear when it comes to its association with the philosophy of holistic education and culturally responsive teaching. Holistic education, rooted in the philosophical traditions of India, focuses on the integral development of the cognitive, emotional, moral, and spiritual aspects of the learner. At the same time, culturally responsive teaching emphasizes the inclusion of the cultural backgrounds, lives, and indigenous identities of the learner in the teaching-learning process. By incorporating IKS in teacher education, it becomes possible to transcend the standardized and de-contextualized teaching-learning process to a more participatory and inclusive approach. Pre-service teachers familiarized with this approach would be in a better position to recognize the cultural diversity in the classroom and make teaching-learning processes more relevant to the socio-cultural lives of their learners. This would not only lead to greater learner engagement but also promote the preservation and promotion of indigenous knowledge traditions in formal educational spaces. The policy environment in India also adds to the integration of IKS in teacher education. The National Education Policy (NEP) 2020 clearly promotes and endorses the integration of Indian knowledge systems, local context, and indigenous practices in all levels and aspects of education. The NEP envisions an education system that is deeply rooted in India's cultural heritage while at the same time being responsive to global developments. In this context, teacher education institutions are seen as playing a transformative role in incorporating IKS in all aspects of teaching and learning. At the same time, it also points to the urgent need for pedagogical reform, as traditional teacher education practices have also been criticized for being overly influenced by Western theoretical paradigms and having a very limited focus on indigenous knowledge systems. This disconnection between teaching practices and the lives of learners, especially in diverse cultural settings, also points to the urgent need for pedagogical reform.

The integration of IKS creates a prospect to re-imagine teacher education as a more contextual, value-based, and culturally informed practice. However, the success of such integration remains contingent upon the perceptions of pre-service teachers, as their beliefs, attitudes, and understanding play a critical role in shaping their disposition to work with IKS. If pre-service teachers perceive IKS as relevant, credible, and valuable as a teaching tool, they are more likely to work with IKS. On the contrary, if they are not aware of IKS or are skeptical about its use, such a disposition may impede its integration. Thus, an exploration of pre-service teachers' perceptions becomes a critical inquiry to assess the viability, challenges, and possibilities of integrating Indian Knowledge Systems within teacher education, which may promote a more purposeful teacher education reform (Kumar, 2022; Sharma & Devi, 2023; UNESCO, 2022; Ministry of Education, 2020).

## **2. Review of Literature**

### **2.1 Indian Knowledge Systems and Education: Concept, Scope, and Relevance**

Indian Knowledge Systems (IKS) is a vast and constantly developing knowledge system based on India's philosophical, scientific, cultural, and lived experiences. Contemporary research on IKS conceptualizes it not just as a system of traditional knowledge, but also as a constantly developing epistemology that provides a unique perspective of knowledge, learning, and engagement with the world. IKS covers a variety of knowledge domains, such as health, ecology, mathematics, linguistics, and ethics, and is based on an integrated and interdisciplinary approach

to knowledge creation. IKS is distinct from Western knowledge systems, which focus on compartmentalization and ignore interconnectedness, sustainability, and contextual relevance (Battiste, 2023; Singh & Rawat, 2022).

The scope of IKS in the realm of education transcends the simple inclusion of knowledge to epistemological change. It aspires to realign the processes in education to more holistic, experiential, and value-oriented learning. The inclusion of IKS in formal education, according to scholars, promotes cognitive justice by affirming multiple knowledge systems and resolving epistemological imbalances in the curriculum (Owuor, 2022). In addition, IKS appears to be more pertinent in the face of global challenges such as environmental sustainability, cultural destruction, and social inequalities. This is because IKS provides locally and ecologically appropriate responses to these problems. In the context of formal and informal education, IKS promotes critical thinking, cultural identity, and morality among learners. These are all desirable outcomes in contemporary visions of inclusive and transformative education (Finny & Mohamed, 2025) (Hermansyah & SH, 2025).

## 2.2 Indian Knowledge Systems in Teacher Education: Curriculum Integration and Pedagogical Implications

The integration of IKS in teacher education has also been identified as one of the key areas that need to be explored, as teachers are key knowledge mediators and play an important role in influencing classroom practices. Recent studies have shown that the integration of IKS in teacher education is not limited to the incorporation of indigenous knowledge; rather, it is more than that, as it requires rethinking the entire curriculum and teacher education processes. The integration of IKS in teacher education curricula includes the incorporation of indigenous perspectives, the promotion of cross-disciplinary learning, and experiential learning with indigenous knowledge systems (Das & Sen, 2023). From a pedagogical perspective, it encourages learner-centered and participatory approaches to teaching and learning. It supports the use of experiential learning approaches such as community interactions and field activities that help pre-service teachers relate theoretical concepts with real-life situations. Studies have shown that such approaches improve the pedagogical flexibility and cultural competency of pre-service teachers (Mishra & Nath, 2023). Further, the inclusion of IKS contributes to the cultivation of critical pedagogical awareness among pre-service teachers by helping them think critically about the dominant knowledge hierarchies and epistemologies (Gupta, 2022). However, the literature has also identified a number of challenges in the inclusion of IKS in teacher education programs such as a lack of institutional support, teacher preparedness, and pedagogical resources. Overcoming these challenges requires a series of efforts in curriculum reforms and policy interventions. The inclusion of IKS in teacher education programs has tremendous potential for the cultivation of more inclusive and relevant pedagogical approaches.

## 2.3 Perception Studies in Teacher Education: Prior Empirical Findings

Perception is also a vital factor in ensuring the success of educational innovations, including IKS in teacher education programs. In the case of pre-service teachers, perception refers to the pre-service teachers' understanding, attitude, and willingness to adopt new approaches to teaching. Literature on the subject reveals that perception is related to the adoption and implementation of new educational innovations. Recent studies have also focused on the pre-service teachers' perception of indigenous knowledge and its role in education. Literature reveals that when pre-service teachers perceive IKS as relevant, valid, and useful, they are likely to adopt it in their teaching approaches (Rani & Thomas, 2024). However, when pre-service teachers lack exposure to IKS and lack clarity on the educational value of IKS, it leads to a negative perception of IKS. Literature also reveals that educational experiences, culture, and the environment also influence pre-service teachers' perception of IKS. Quantitative studies have attempted to assess perceptions through cognitive awareness, affective orientation, and behavioural intention. On the

other hand, qualitative studies have offered more insight into the meanings and interpretations given to IKS by pre-service teachers. Nevertheless, literature reveals a scarcity of mixed methods studies that have attempted to assess perceptions through a combination of statistical analysis and qualitative exploration.

### **Theoretical framework**

The framework for this research study is based on four complementary theories that explain how pre-service teachers understand and respond to the use of Indian Knowledge Systems (IKS) in teacher education. Constructivism serves as the base for understanding how learning occurs, meaning that learners actively create meaning as they learn. According to Jean Piaget, learners create meaning through the connection of new knowledge to existing knowledge (i.e., the child's prior experiences) instead of passively receiving it. Because IKS can be understood as a form of indigenous knowledge that has traditionally been formed through lived experience, cultural practices, and community contexts, the constructivist perspective is especially applicable in relation to IKS. Pre-service teachers will interpret and internalise their experiences with IKS based on their prior beliefs and educational experiences and is therefore likely to make their learning more meaningful and contextually based. Pre-service teachers will also be encouraged to reflect on their experiences through a series of self-reflective and reconstructive questions and will, as a result, develop a more meaningful understanding of the teaching of, and knowledge based on, IKS (Piaget, 1972; Vygotsky, 1978).

The Culturally Responsive Pedagogy framework helps additional perspective by emphasizing the impact and influence of culture in shaping the process of teaching and learning. According to Gloria Ladson-Billings' introduction of the concept, improving classroom practices to align with students' cultural identities and experiences is critical for teacher education. This framework encourages future educators to acknowledge and appreciate the wide variety of knowledge systems that exist in the world today, including Indigenous Knowledge Systems (IKS). By incorporating culturally appropriate teaching methods and content, teachers are able to develop a classroom environment that is welcoming and respectful of all students' cultural backgrounds. The development and incorporation of IKS into pedagogy supports the idea that integrating IKS should involve more than simply adding content, but rather requires a substantive change in the way that pedagogy is approached, to ensure that the pedagogy used is equitable, engaging, and meaningful (Ladson-Billings, 1995; Gay, 2018).

Indigenous Knowledge Systems (IKS) and Decolonial Theory together provide a different lens through which to interrogate how the current education system has tended to privilege Western knowledge systems over Agent-based (indigenous) ways. As explained by Walter D. Mignolo, "education, including all the academic areas taught in schools, has been the main means of marginalizing indigenous ways of knowing (epistemology) through their rejection; consequently the relationship between the dominant academic knowledge and indigenous knowledge has resulted in an epistemologically or knowledge-oriented imbalance between the two systems (epistemic inequality)". Based on this perspective, the integration of IKS has the potential to restore or correct the imbalance between two or more systems of knowledge and to acknowledge that different knowledge systems exist. Using these conceptual foundations in pre-service teacher education helps to develop a critical understanding of knowledge hierarchies and will encourage pre-service teachers to practice in ways that are more inclusive and socially just (Mignolo, 2011; Smith, 2021).

The Theory of Planned Behaviour helps explain how our beliefs about things (perceptions) affect what we do (actions). Icek Ajzen proposed this theory, stating that our behaviour is influenced by: our attitudes towards the behaviour; our beliefs about whether other people in our social circle believe the behaviour is acceptable (subjective norms), and; how in control we perceive ourselves to be of the behaviour (perceived control). This study examines how pre-service teachers' perceptions, as to whether they perceive IKS to be useful, acceptable and feasible,

directly affect their intention to incorporate IKS into their teaching. When teachers express positive attitudes toward IKS and are operating within a supportive institution, they are more likely to adopt IKS-based practices. Conversely, if teachers express negative perceptions of IKS, they will be less likely to implement such practices (Ajzen, 1991).

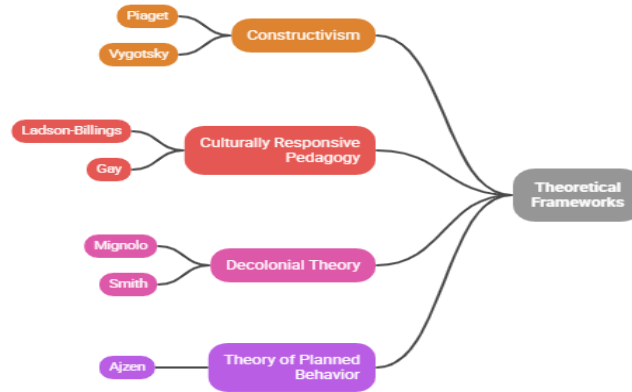


Figure 1. Theoretical Framework

**Conceptual Framework**

Perception is considered to be a multidimensional construct that consists of cognitive, affective and behaviour aspects, and it is these components that shape teachers' readiness for pedagogically integrating indigenous knowledge systems (IKS). The cognitive dimension relates to the cognitive awareness, knowledge and conceptual understanding that pre-service teachers have of IKS, such as their familiarity with its principles, the relevance of IKS to their own learning experiences and its application to the education system. Without a proper cognitive base, meaningful engagement with IKS is likely to be limited. The affective dimension relates to teachers' attitudes, beliefs and values towards IKS and includes the extent to which they believe that IKS is relevant, credible and useful as a source of information for teaching and learning. If teachers develop a positive affective orientation towards IKS then this will further enhance their acceptance of IKS as well as their motivation to integrate IKS into their teaching. Negative perceptions of IKS will lead to resistance. The behavioural dimension relates to the readiness and intent of pre-service teachers to use IKS in their classroom practice. This would include their willingness to use IKS, their confidence to use IKS and their perceived capability to use IKS in their pedagogical practice. The behavioural dimension links perception with the actual or intended behaviours of pre-service teachers in relation to their teaching. All three of the above dimensions are connected to one another because cognitive understanding shapes attitudes towards IKS, attitudes shape readiness to use IKS and the combined influence of these dimensions determines the overall perception of IKS.

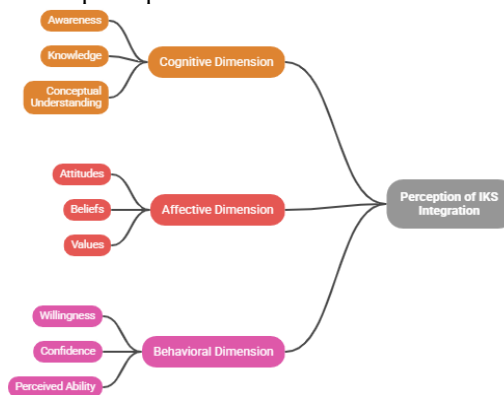


Figure 2. Conceptual Model

**Objective**

To analyze the perceptions of pre-service teachers towards the integration of Indian Knowledge Systems in teacher education.

**Research Question**

What are the perceptions of pre-service teachers towards the integration of Indian Knowledge Systems in teacher education?

**3. Methodology**

This study uses a mixed methods research strategy, particularly a convergent parallel approach. The sample for the study comprises 150 pre- service (B.Ed.) teachers enrolled in two different teachers training institutions of Keonjhar District, Odisha, were selected randomly. A 5 point Likert scale was developed consisting of 3 dimensions (Cognitive, Affective and Behaviour). Each dimension consists of 5 items. The Cronbach Alpha reliability of the scale is 0.811. Further a semi-structured interview was conducted among purposively selected 12 prospective teachers. Informed consent was taken for data collection. Quantitative data were analysed applying mean and standard deviation and qualitative data were analysed using thematic analysis.

**4. Results and Analysis**

**4.1 Item wise Analysis of Perception of Pre-service Teachers**



Figure 3. Mean and SD of individual items of the Scale

Positive attitude toward IKS leads the entire dataset at M = 3.88 with the lowest SD (0.91), meaning respondents not only scored highest here but also agreed most consistently. Q8 (Emotional connection, 3.69), Q9 (Valuing IKS in daily life, 3.67), and Q10 (Respect for IKS holders, 3.67) round out the top group among all Affective items. Frequency of IKS use (M = 3.27) is the weakest item overall, followed closely by Q14 (Integrating IKS in practice, 3.35) and Q15 (Advocating for IKS adoption, 3.35). This confirms the attitude-behavior gap: participants demonstrated favourable attitudes toward IKS but the actual frequency and depth of practice is noticeably lower. Items with high SD ( $\geq 1.10$ ) are Q4 (Familiarity with IKS sources, 1.18), Q13 (Sharing IKS with others, 1.14), Q14 (Integrating IKS, 1.13), and Q3 (Understanding IKS value,

1.12) indicating divided opinions. In contrast, Q6 (0.91), Q5 (0.98), and Q8 (0.99) have the tightest consensus, suggesting these are areas of broad agreement. Within Behavioural, Q13 (Sharing IKS,  $M = 3.57$ ) stands out considerably above Q12 (3.27) means prospective teachers are more comfortable talking about IKS than actively using it. Within Cognitive, Q4 (Familiarity with sources, 3.43) is the weakest, pointing to a gap in access to or exposure to actual IKS materials despite reasonable conceptual awareness (figure-3).

#### 4.2 Dimension-wise Analysis of Perception of Pre-service Teachers

Table 1. Dimension-wise Analysis of Perception of Pre-service Teachers

Dimension	Mean	SD
Cognitive	3.50	1.08
Affective	3.71	1.01
Behaviour	3.38	1.08

The analysis by dimension shows that the affective dimension ( $M = 3.71$ ) had the highest mean score. This means that pre-service teachers had a very positive attitude toward Indian Knowledge Systems. The cognitive ( $M = 3.50$ ) and behavioral ( $M = 3.38$ ) dimensions indicate moderate levels, implying restricted comprehension and preparedness for implementation. The relatively high standard deviation values ( $SD \approx 1$ ) across cognitive and behavioral dimensions indicate substantial variability in responses, pointing to uneven knowledge levels and inconsistent application of IKS among participants (Table-1).

#### 4.3 Qualitative Analysis of Semi-structure Interview Data

##### Interview data were analysed using thematic analysis

##### A. Knowledge and Understanding of IKS

Most of the prospective teachers who took part had a basic but limited understanding of Indian Knowledge Systems. They often linked IKS to traditional fields like yoga, Ayurveda, and cultural practices. However, only a small number of participants expressed a more profound comprehension connecting IKS to pedagogy, sustainability, or holistic education.

"IKS means our traditional knowledge, like yoga and Ayurveda, but we haven't studied it thoroughly." (P3)

"It helps with learning as a whole, but we don't know how to connect it to our subject." (P6)

This suggests that although awareness is present, conceptual clarity and academic exposure are still lacking, which is consistent with the quantitative observation of moderate cognitive scores.

##### B. Attitude towards inclusion of IKS

Most participants viewed that it was a good idea to include IKS in teacher education. They thought it was useful for making things more culturally relevant, getting students involved, and helping them form their identities.

"Using examples from our own culture helps students understand better." (P1)

"IKS helps us retain our values and traditions." (P10)

Even though this was a good thing, some people said that traditional knowledge and modern educational needs need to be balanced.

"It should be part of the curriculum, but only with contemporary knowledge so that students are ready for the future." (P7)

In general, the results show that participants are very open to integrating IKS.

### C. Readiness towards Implementation of IKS

Participants indicated insufficient preparedness and assurance in the implementation of IKS in educational practice. Even though they said they were willing, most of them weren't sure how to use IKS in their lesson plans and teaching methods.

"We want to use IKS, but we don't know how to do it in class." (P12)

"We don't get adequate suggestions or examples in our training." (P8)

This shows a clear difference between having a positive attitude and actually doing something, which is in line with the lower behavioural scores in the quantitative findings.

### D. Integration of Quantitative and Qualitative Findings

In order to enhance the mixed methods design, the quantitative and qualitative results were compared to see the convergence points. The outcomes of both strands were similar. The quantitative data showed that the mean score for the affective dimension was the highest ( $M = 3.71$ ) indicating positive attitudes of pre-service teachers about the integration of Indian Knowledge Systems (IKS). This was confirmed by responses from interviews where participants said that the IKS was culturally relevant and important for making teaching more relevant. The cognitive dimension had a moderate mean score ( $M = 3.50$ ), and this was consistent with the results of the interviews, where participants exhibited only basic knowledge of IKS and limited formal exposure during training. The behavioural dimension had the lowest mean score ( $M = 3.38$ ), which means that the preparedness level in implementing IKS was fairly low (Table-2). This was confirmed by excerpts from the interviews where the participants were unsure about the way in which they could introduce IKS into their lesson planning and classroom teaching. In overall findings, both sets of data agreed that pre-service teachers have positive attitudes toward IKS and would like to implement it but need more institutionalized learning experiences, training and support to relate their positive attitudes to effective teaching.

Table 2. Integration of Quantitative and Qualitative Findings

Dimension	Quantitative findings	Qualitative Evidence	Integrated Interpretation
Cognitive	Moderate awareness ( $M = 3.50$ )	Participants shared some basic understanding but minimal formal opportunities to learn about IKS.	Awareness is present, but conceptual understanding is not well developed.
Affective	Highest mean score ( $M = 3.71$ )	Pre-service teachers were very positive towards IKS from the cultural and educational perspective.	Pre-service educators possess exceptionally favourable sentiments about Indigenous Knowledge Systems (IKS).
Behavioural	Lowest mean score ( $M = 3.38$ )	Participants reported not feeling confident and not having practical strategies to implement positive attitudes in the classroom.	Positive attitudes have not been converted to readiness in the classroom yet
Overall	Moderate-high perception	Persistent requests for training and resources.	There is a need for structured preparation to close the interest to practice gap.

## 5. Discussion

The results reveal an intriguing disparity between the perceptions of pre-service teachers and their actual capabilities. Most of the participants who took part have a good opinion of Indian Knowledge Systems (IKS), but they still don't know much about it or how to use it in the classroom. Other studies have shown similar trends, where teachers value indigenous knowledge

but have trouble using it in real life (Kumar & Saini, 2022; Owuor, 2020). The difference in cognitive scores shows that students aren't getting the same amount of IKS training or the same kind of training. The interview results also show that it is hard to put the ideas into action when there is lack of guidance or real-world examples. This corroborates research highlighting the significance of adequate training and institutional backing (Mapara, 2022). At the same time, the strong positive attitude shows that people are becoming more open to culturally relevant teaching methods. But this interest might not turn into real-world practice in the classroom if you don't have any practical skills. So, teacher education programs need to do more than just teach people about things; they also need to give them hands-on experience and teach them how to use what they learn in the classroom. The study contributes to educational scholarship by identifying an attitude–practice gap to the integration of IKS. This shows that the success of curriculum reform is not so much a matter of policy endorsement, but rather the effectiveness of teacher education to prepare future teachers to translate culturally embedded knowledge into meaningful classroom experiences. Thus, the findings move the conversation from “Why should IKS be included?” to the more important question of, how can teachers be prepared to teach from, with and through Indian Knowledge Systems?.

## **6. Conclusion**

This study sought to investigate pre-service teachers' perceptions regarding the integration of Indian Knowledge Systems (IKS) in teacher education, encompassing cognitive, affective, and behavioural dimensions. The results show that pre-service teachers have very positive attitudes toward IKS, but they don't understand it very thoroughly and aren't very ready to use it in their classroom activities. This difference between what people believe and what they do shows that teacher preparation needs to include more structured and meaningful interactions with IKS. The research has significant ramifications for teacher education. It suggests that programs need to do more than just talk about theory; they need to give future teachers hands-on training, chances to learn by doing, and ways to integrate IKS into the curriculum so they can use it with confidence in the classroom. Improving these areas can help teachers develop culturally responsive and contextually relevant teaching methods. The study, however, has a few drawbacks. The sample size was relatively small and confined to particular institutions, potentially impacting the generalizability of the results. Also, using self-reported data may not give a complete picture of what happens in the classroom. Future research can enhance this study by incorporating larger and more diverse samples, as well as investigating intervention-based studies that evaluate the effects of specific training programs on IKS integration. Longitudinal studies may also elucidate the temporal translation of perceptions into practice. The study emphasizes that pre-service teachers already possess a readiness to adopt IKS but what is required now is appropriate support to convert that readiness into significant classroom implementation. Thus IKS is not deficient in acceptance rather it awaits implementation by empowered educators.

## **Conflict of Interest**

The authors declare no conflicts of interest

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