

TEACHER PREPAREDNESS FOR INTEGRATING INDIAN KNOWLEDGE SYSTEMS: A COMPARATIVE STUDY OF CURRICULAR PRACTICES FOR SUSTAINABILITY

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Abstract:

The integration of Indian Knowledge Systems (IKS) into school education is essential for promoting culturally responsive and sustainability-oriented learning. In the context of Viksit Bharat, curricular practices need to bridge traditional knowledge with modern pedagogy. This study adopts a comparative approach to examine teacher preparedness for integrating IKS across variables such as gender, age, teaching experience, and subject taught. Using a descriptive survey method, data were collected from 40 teachers through a structured Likert-scale questionnaire.

The findings reveal a moderate level of overall preparedness, with variations across groups. Teachers with greater experience and those from Social Science and Language backgrounds demonstrate higher preparedness, while Mathematics and ICT teachers show comparatively lower readiness. Key challenges include lack of training, limited resources, and curriculum constraints. The study highlights the need for targeted teacher training, resource development, and curriculum support to strengthen sustainable curricular practices through IKS.

Keywords: *Indian Knowledge Systems (IKS), Teacher Preparedness, Sustainable Education, Curricular Practices, NEP 2020, Viksit Bharat*

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Introduction:

Indian Knowledge Systems (IKS) constitute a rich and diverse body of indigenous knowledge, cultural traditions, and context-specific practices that have evolved over centuries. These systems reflect deep insights into sustainable living, environmental harmony, and community-based learning. In recent years, there has been a growing recognition of the importance of integrating IKS into formal education to make learning more contextual, meaningful, and aligned with local realities.

In the vision of Viksit Bharat, education is expected to play a transformative role by bridging traditional knowledge with modern scientific approaches. The integration of IKS into school curricula not only strengthens cultural identity but also promotes sustainability-oriented education. Indigenous practices often emphasize ecological balance, resource conservation, and experiential learning, making them highly relevant in addressing contemporary global challenges.

The National Education Policy (NEP) 2020 strongly advocates the incorporation of Indian Knowledge Systems into curriculum and pedagogy. It calls for the redesign of curricular practices to include local knowledge, traditions, and culturally relevant content. However, the successful implementation of such

reforms largely depends on teacher preparedness, as teachers act as the primary agents in translating curriculum into classroom practice.

Teacher preparedness for IKS integration is a multidimensional construct that includes awareness, pedagogical competence, confidence, and access to appropriate teaching-learning resources. While some teachers may be familiar with local knowledge systems, their ability to integrate them effectively into classroom teaching varies considerably. Factors such as teaching experience, subject specialization, and exposure to training programs may influence the level of preparedness.

Despite policy emphasis, several challenges hinder the effective integration of IKS into education. These include lack of structured training programs, limited availability of teaching materials, rigid curricular frameworks, and insufficient institutional support. Moreover, the integration of IKS may vary across subjects, as disciplines like Social Science and Languages naturally accommodate contextual knowledge more easily than subjects like Mathematics and ICT.

In this context, the present study adopts a comparative approach to examine teacher preparedness for integrating Indian Knowledge Systems in school education. It specifically analyzes variations in preparedness across gender, age groups, teaching experience, and subject areas. The study also explores the challenges faced by teachers in implementing IKS within curricular practices for sustainability. By doing so, it aims to contribute to the ongoing discourse on strengthening education systems in alignment with the goals of sustainable development and Viksit Bharat.

Research Questions:

1. What is the overall level of teacher preparedness for integrating Indian Knowledge Systems (IKS) in school education?
2. Does teacher preparedness differ based on **gender**?
3. Does teacher preparedness vary across different **age groups**?
4. What is the relationship between **teaching experience** and preparedness for IKS integration?
5. Does teacher preparedness differ across **subjects taught**?
6. What challenges do teachers face in integrating IKS into curricular practices for sustainability?

Objectives:

1. To assess the overall level of teacher preparedness for integrating IKS
2. To compare teacher preparedness based on gender
3. To examine differences in preparedness across age groups
4. To analyze the influence of teaching experience on IKS integration
5. To compare preparedness across different subjects taught
6. To identify challenges in implementing IKS in curricular practices

Null Hypotheses:

H₀₁: There is no significant difference in teacher preparedness based on gender

H₀₂: There is no significant difference in teacher preparedness across different age groups

H₀₃: There is no significant difference in teacher preparedness based on teaching experience H₀₄: There is no significant difference in teacher preparedness across subjects taught

Research Methodology:

The study adopts a descriptive survey method to examine teacher preparedness for integrating IKS. A sample of 40 teachers from diverse backgrounds was selected using convenience sampling.

Data were collected using a structured questionnaire on a 5-point Likert scale, covering awareness, training, classroom practices, and perceptions of IKS. Data analysis was conducted using mean scores and percentage analysis, along with comparative interpretation across variables.

Data Analysis and Calculation:

The data obtained from the questionnaire were analyzed using appropriate statistical methods such as mean and percentage analysis. This enabled a comprehensive understanding of teacher preparedness and its variation across key variables.

1) Gender-wise Analysis of Teacher Preparedness

Gender-wise analysis was undertaken to assess variations in teacher preparedness across male and female respondents. The findings highlight the extent to which gender influences the integration of Indian Knowledge Systems in classroom practices.

Table 1: Gender vs Mean Preparedness Score

Gender	Frequency (N)	Percentage (%)	Mean Score	Interpretation
Female	32	80%	3.20	Moderate preparedness
Male	8	20%	3.05	Moderate (slightly lower)

Table 1 shows the gender-wise distribution of respondents and their mean preparedness scores for integrating Indian Knowledge Systems (IKS). The sample is predominantly female (80%), with male teachers comprising 20%.

In terms of preparedness, both female (Mean = 3.20) and male teachers (Mean = 3.05) fall within the moderate category, with females showing slightly higher preparedness. However, the difference is minimal, indicating that gender has only a limited influence on preparedness.

The gender-wise differences have also been represented through a bar graph for clearer visual comparison

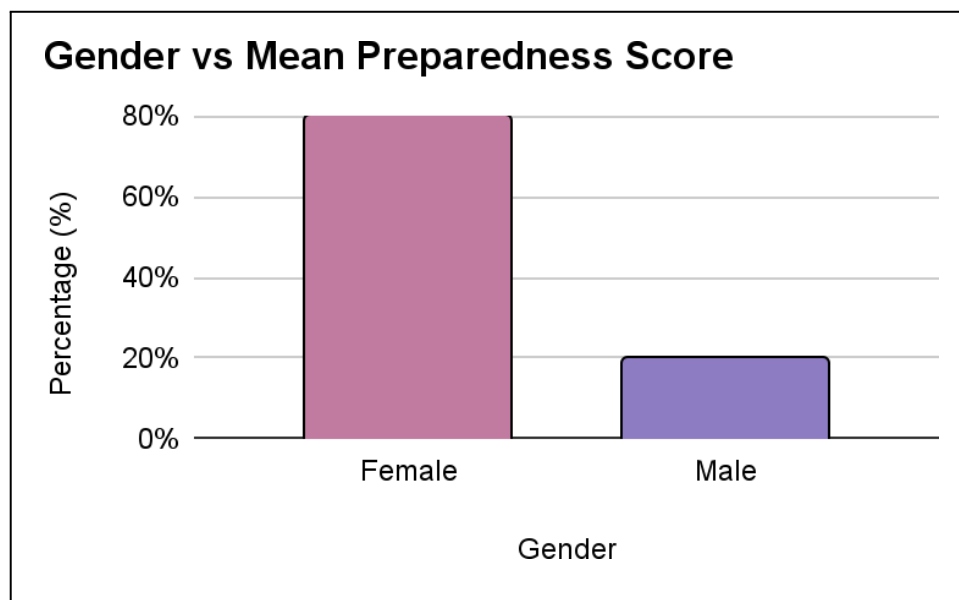


Fig 1: Gender vs Mean Preparedness Score

2) Age-wise Analysis

Age-wise analysis was undertaken to assess differences in teacher preparedness across various age categories. The analysis highlights the relationship between age and readiness for integrating Indian Knowledge Systems in classroom practices.

Table 2: Age Group vs Preparedness

Age Group	Frequency	Percentage (%)	Mean Score	Interpretation
Below 25	2	5%	3.10	Moderate
25–30	14	35%	3.05	Moderate
31–40	6	15%	3.20	Moderate
41–50	10	25%	3.30	Higher
Above 50	8	20%	3.25	Moderate–High

Table 2 presents the age-wise distribution of respondents and their mean preparedness scores for integrating Indian Knowledge Systems (IKS). The largest group belongs to the 25–30 years category (35%), followed by 41–50 years (25%) and above 50 years (20%).

In terms of preparedness, teachers aged 41–50 years show the highest mean score (3.30), followed by those above 50 years (3.25), indicating relatively higher preparedness. Younger groups, particularly 25–30 years (Mean = 3.05), show slightly lower but still moderate preparedness levels. Overall, the findings suggest that preparedness tends to increase with age and experience, although all groups fall within the moderate range. The results are further illustrated through a bar graph for clearer comparison.

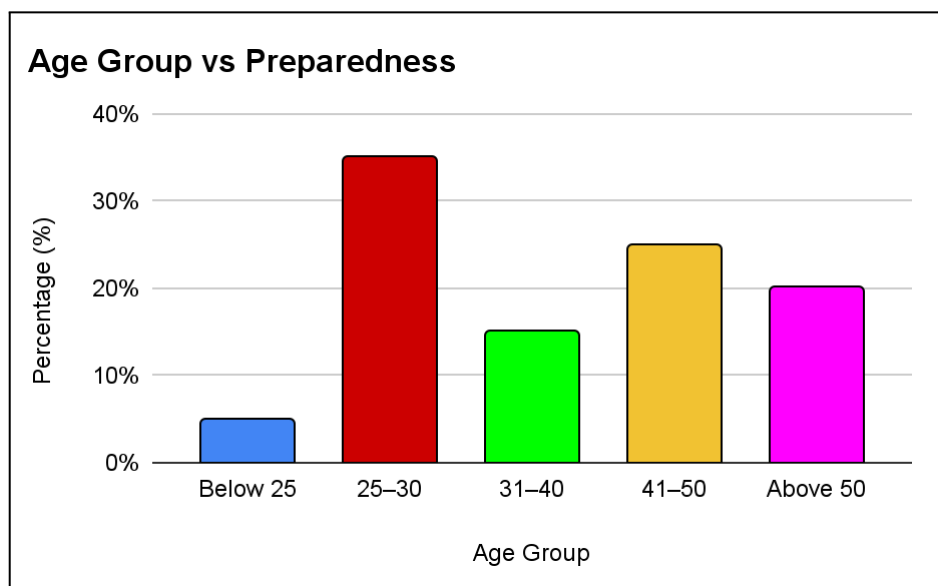


Fig 2: Age-wise Analysis

3) Experience-wise Analysis

Experience-wise analysis was undertaken to assess variations in teacher preparedness across different levels of teaching experience. The findings highlight the relationship between professional experience and readiness for IKS integration.

Table 3: Teaching Experience vs Preparedness

Experience	Frequency	Percentage (%)	Mean Score	Interpretation
Less than 5 years	16	40%	3.00	Moderate–Low
6–10 years	8	20%	3.15	Moderate
11–20 years	10	25%	3.30	Moderate–High
More than 20 years	6	15%	3.35	Higher

Table 3 presents the distribution of respondents based on teaching experience and their mean preparedness scores for integrating Indian Knowledge Systems (IKS). The largest group comprises teachers with less than 5 years of experience (40%), indicating a predominantly early-career sample.

In terms of preparedness, teachers with more than 20 years of experience show the highest mean score (3.35), followed by those with 11–20 years (3.30). Teachers with 6–10 years (3.15) and less than 5 years (3.00) demonstrate comparatively lower preparedness.

Overall, the findings indicate a positive relationship between teaching experience and preparedness for IKS integration, with experienced teachers showing greater readiness. The results are further illustrated through a bar graph for clear comparison.

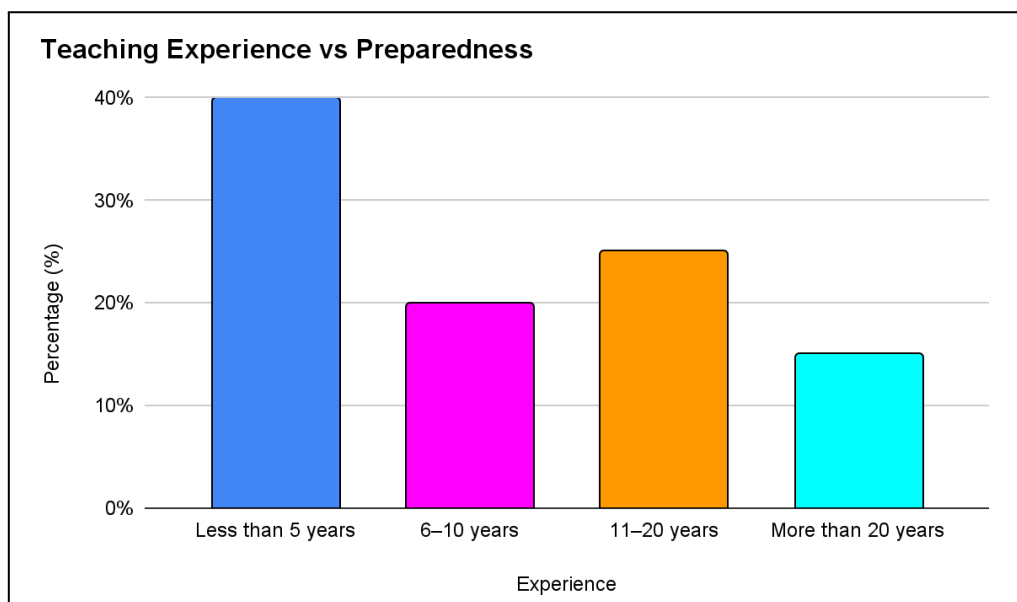


Fig. 3: Experience-wise Analysis

4) Subject-wise Analysis

Subject-wise analysis was undertaken to assess differences in teacher preparedness across various subject domains. The findings highlight the role of subject specialization in shaping readiness for IKS integration.

Table 4: Subject Taught vs Preparedness

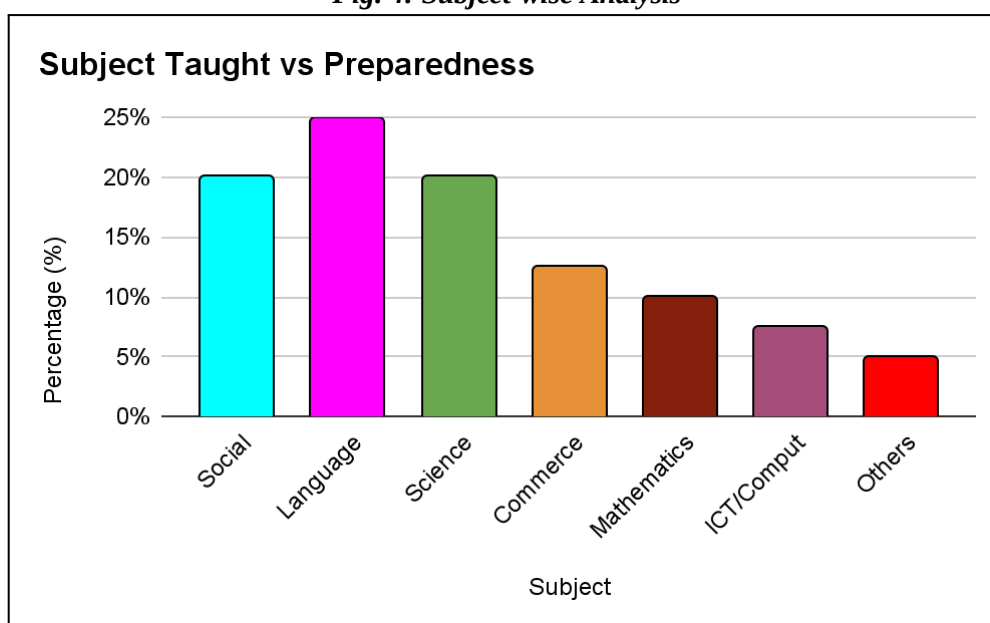
Subject	Frequency	Percentage (%)	Mean Score	Interpretation
Social Science	8	20%	3.40	Highest preparedness
Language	10	25%	3.30	High
Science	8	20%	3.15	Moderate
Commerce	5	12.5%	3.10	Moderate
Mathematics	4	10%	2.90	Lower
ICT/Computer	3	7.5%	3.00	Moderate
Others	2	5%	3.10	Moderate

Table 4 presents the distribution of respondents across subject areas along with their mean preparedness scores for integrating Indian Knowledge Systems (IKS). The largest group is Language teachers (25%), followed by Social Science and Science (20% each).

In terms of preparedness, Social Science teachers show the highest mean score (3.40), followed by Language teachers (3.30), indicating higher readiness in context-based subjects. Science (3.15), Commerce (3.10), and ICT (3.00) reflect moderate preparedness, while Mathematics shows the lowest mean score (2.90).

Overall, the findings suggest that preparedness varies across subjects, with higher readiness in contextual disciplines and lower preparedness in abstract or technical subjects. The results are also represented through a bar graph for clear comparison.

Fig. 4: Subject-wise Analysis



Summary:

The analysis reveals that the sample is predominantly female, with 80% of respondents being female teachers. This indicates a gender-skewed distribution, which reflects the higher representation of women in the teaching profession. While this provides valuable insights into teacher preparedness, it also suggests that the findings may be more reflective of female teachers' perspectives on IKS integration.

With 35% of respondents belonging to the 25–30 years age group, the data indicate that the majority of participants are relatively young teachers. This suggests that early-career educators form a significant portion of the sample, which may influence the overall preparedness levels, as younger teachers may still be developing their pedagogical skills and exposure to Indian Knowledge Systems.

The data show that 40% of teachers have less than 5 years of teaching experience, highlighting that the sample is largely composed of early-career professionals. This trend is significant, as less experienced teachers demonstrated comparatively lower preparedness levels in earlier analysis. It emphasizes the need for targeted training and professional development programs to support novice teachers in integrating IKS effectively.

The subject-wise distribution indicates that Language teachers form the largest group (25%), followed by other subjects. This suggests that contextual and culturally oriented subjects are more represented in the

sample. As observed in earlier findings, such subjects tend to facilitate easier integration of Indian Knowledge Systems, thereby influencing overall preparedness levels.

Overall, the key trends indicate that the sample is dominated by female, young, and early-career teachers, primarily from contextual subject backgrounds. These characteristics play a crucial role in shaping teacher preparedness and highlight the importance of experience, subject context, and targeted training in strengthening IKS integration.

Hypothesis Testing:

H₀₁: There is no significant difference in teacher preparedness based on gender

The analysis of mean preparedness scores indicates only a marginal difference between female (3.20) and male (3.05) teachers. Both groups fall within the same category of moderate preparedness, and the variation is not substantial enough to indicate any meaningful difference. Hence, the given null hypothesis is accepted. This may be due to similar professional roles, equal access to teaching environments, and comparable exposure to Indian Knowledge Systems among both male and female teachers.

H₀₂: There is no significant difference in teacher preparedness across different age groups

The age-wise comparison shows noticeable variation in mean preparedness scores, with teachers in the 41–50 age group demonstrating higher preparedness compared to younger groups such as 25–30 years. This indicates that preparedness tends to increase with age. Hence, the given null hypothesis is rejected. This variation may be attributed to increased maturity, teaching exposure, and accumulated pedagogical experience among older teachers.

H₀₃: There is no significant difference in teacher preparedness based on teaching experience

The findings reveal a clear increasing trend in preparedness scores with the rise in teaching experience, from 3.00 among teachers with less than 5 years of experience to 3.35 among those with more than 20 years. This reflects a meaningful difference in preparedness levels. Hence, the given null hypothesis is rejected. This may be due to greater classroom experience, familiarity with diverse teaching strategies, and enhanced confidence developed over time.

H₀₄: There is no significant difference in teacher preparedness across subjects taught The subject-wise analysis indicates significant variation, with Social Science teachers showing the highest preparedness (3.40) and Mathematics teachers the lowest (2.90). This difference highlights the influence of subject context on IKS integration. Hence, the given null hypothesis is rejected. This may be because subjects like Social Science and Language naturally align with cultural and contextual knowledge, whereas abstract subjects such as Mathematics and ICT present challenges in integration.

Challenges Identified:

The analysis of responses reveals several key challenges faced by teachers in integrating Indian Knowledge Systems (IKS) into curricular practices. One of the major challenges identified is the lack of adequate training and professional development opportunities. A significant number of teachers reported that they have not

received formal training or attended workshops related to IKS, which limits their confidence and ability to effectively incorporate indigenous knowledge into classroom teaching.

Another important challenge is the limited availability of teaching-learning resources and materials. Teachers highlighted the absence of structured content, textbooks, and practical examples related to IKS, making it difficult to design lessons and activities. This issue is particularly prominent in subjects such as Mathematics and ICT, where linking abstract concepts with indigenous knowledge is more challenging.

The rigidity of the existing curriculum also emerged as a barrier. Respondents indicated that the prescribed syllabus is already extensive, leaving little scope for integrating additional content like IKS. The lack of clear curricular guidelines further complicates the process, as teachers are uncertain about how to align IKS with subject-specific objectives.

In addition, lack of awareness and conceptual clarity about IKS was observed, especially among early-career teachers. Some participants expressed that they are not fully familiar with the concept, which affects their ability to implement it effectively in classroom settings.

Teachers also reported pedagogical challenges, including difficulty in connecting indigenous knowledge with modern subject content and engaging students meaningfully. Furthermore, issues such as language barriers, limited institutional support, and lack of collaboration with local communities were identified as factors that hinder effective integration.

Overall, these findings indicate that while teachers recognize the importance of IKS, multiple structural, pedagogical, and resource-related challenges must be addressed to ensure its successful implementation in education for sustainability.

Discussion:

The findings of the present study indicate that teacher preparedness for integrating Indian Knowledge Systems (IKS) into curricular practices is generally at a moderate level. While teachers demonstrate a certain degree of awareness and willingness, the extent of effective implementation remains limited.

The gender-wise analysis revealed minimal variation in preparedness levels, leading to the acceptance of the related hypothesis. This suggests that gender does not significantly influence teacher readiness for IKS integration. However, age and teaching experience emerged as important factors, with more experienced teachers demonstrating higher preparedness. This highlights the role of professional exposure, classroom experience, and accumulated pedagogical knowledge in enhancing teachers' ability to integrate IKS effectively.

Subject-wise differences further indicate that contextual disciplines such as Social Science and Languages show higher preparedness compared to subjects like Mathematics and ICT. This suggests that the nature of the subject plays a crucial role in facilitating or constraining IKS integration. Subjects that are culturally and socially oriented naturally provide greater scope for incorporating indigenous knowledge.

The challenges identified in the study, such as lack of training, limited resources, and rigid curriculum structures, provide a strong explanation for the moderate preparedness levels observed. These barriers

prevent teachers from translating their awareness into practice, particularly among early-career teachers and those from technical subject areas.

Overall, the study emphasizes that teacher preparedness is influenced more by professional and contextual factors than by demographic characteristics, and that effective implementation of IKS requires systematic support through training, resources, and curriculum reform.

Conclusion:

The present study concludes that teacher preparedness for integrating Indian Knowledge Systems in school education is at a moderate level, indicating both potential and scope for improvement. While teachers show a positive orientation towards IKS and recognize its importance in promoting sustainable and culturally relevant education, their ability to implement it effectively is constrained by several challenges.

The findings reveal that age, teaching experience, and subject specialization significantly influence preparedness, whereas gender does not have a substantial impact. Experienced teachers and those from contextual subject areas demonstrate higher readiness, highlighting the importance of exposure and subject relevance in IKS integration.

The study also underscores that lack of training, insufficient resources, and limited curricular flexibility are key barriers that need to be addressed. Therefore, strengthening teacher preparedness is essential for achieving the goals of sustainable education and realizing the vision of integrating Indian Knowledge Systems in mainstream education.

Recommendations:

Based on the findings of the study, the following recommendations are suggested:

- **Provision of Training Programs:** Regular workshops, seminars, and professional development programs should be organized to enhance teachers' understanding and skills related to IKS integration.
- **Development of Teaching Resources:** Curriculum developers and educational institutions should provide structured teaching-learning materials, including textbooks, activity modules, and case studies related to IKS.
- **Curriculum Flexibility:** The curriculum should be redesigned to create space for integrating indigenous knowledge, with clear guidelines for teachers on how to incorporate IKS into different subjects.
- **Subject-specific Support:** Special focus should be given to subjects like Mathematics and ICT by developing innovative strategies and examples to facilitate IKS integration.
- **Awareness and Orientation Programs:** Initiatives should be taken to improve conceptual clarity about IKS among teachers, especially early-career educators.
- **Institutional Support:** Schools and educational authorities should encourage collaboration with local communities and provide institutional support for implementing IKS-based activities.
- **Integration with Sustainable Education Goals:** IKS should be linked with environmental education and sustainability practices to make learning more meaningful and contextually relevant.

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