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Abstract

Background Indigenous knowledge comprises localized, generationally transmitted insights crucial for sustainable development. Integrating these cultural frameworks into primary curricula bridges the gap between formal education and students' lived experiences, fostering cultural identity, contextual relevance, and cognitive continuity during early childhood development.

Purpose This study investigates the structural integration of Hadiya Indigenous Knowledge (HIK) into the primary school curriculum of the Hadiya Zone, Ethiopia.

Methods Utilizing a sequential explanatory mixed-methods design, the study evaluated the alignment between designated curricular syllabi and active instructional materials. In the first phase, a content analysis was performed on purposefully selected Environmental Science and Performing and Visual Arts textbooks for grades 4, 5, and 6 to quantify pedagogical frequencies, page counts, and structural space allocations. The second phase investigated deep representational elements, examining content organization, curricular architecture, and the systemic equilibrium between HIK and Western Knowledge (WK) paradigms. Qualitative data were gathered through semi-structured interviews with eight purposively sampled curriculum designers specializing in these subject areas.

Findings The content analysis revealed that despite preliminary integration efforts, most pedagogical elements and syllabi exhibit a low level of HIK incorporation, leaving the curriculum heavily dominated by Western-centric frameworks. Furthermore, thematic analysis of the interview data indicated that systemic barriers such as a pervasive lack of IK awareness, insufficient professional training, a deficit of well-documented indigenous source materials, a shortage of instructional models, and severe time constraints significantly impede textbook authors from achieving epistemological balance.

Implications The study suggests that active collaboration among indigenous knowledge holders, curriculum designers, educational experts, and teachers is necessary to build a culturally responsive educational system. Consequently,

curriculum development frameworks must shift from superficial tokenism toward the systematic, balanced infusion of localized and global knowledge systems during textbook revisions.

Keywords Environmental sciences, Hadiya, Indigenous knowledge integration, Primary school curriculum, Textbook content analysis.

1. Introduction

1.1. Background

Incorporating Indigenous Knowledge (IK) into formal curricula is globally recognized as a vital mechanism for enhancing educational relevance, fostering cultural responsiveness, and strengthening students' connections to their lived experiences. The United Nations Educational, Scientific and Cultural Organization (UNESCO) underscores that embedding local, indigenous insights into formal learning structures is critical for cultivating sustainable, culturally sensitive pedagogy (UNESCO, 2022). International educational policy frameworks increasingly advocate for the structural validation of indigenous epistemologies (Ronoh, 2017). They call on educational institutions to move beyond the superficial documentation of local heritage and shift toward an active, respectful pedagogical engagement with traditional knowledge custodians. Despite this global consensus, the practical implementation of indigenous perspectives within formal educational materials remains in its early stages globally, creating a systemic disconnect between high-level policy rhetoric and classroom reality (Yeseraw et al., 2023). The discourse surrounding curriculum decolonization is deeply relevant to the historical trajectory of the Ethiopian education system. Since the establishment of modern formal schooling in 1908, Ethiopia's curriculum has been heavily influenced by foreign educational philosophies imported through various political regimes. Over the past century, external educational paradigms from France (1908–1935), Italy (1936–1941), Britain (1941–1952), the United States (1952–1974), and Eastern Europe under the socialist Dergue administration (1974–1991) shaped the country's pedagogy. Consequently, contemporary scholars argue that subsequent post-1991 federal curriculum frameworks systematically marginalized local indigenous components during implementation, prioritizing Western-centric educational models at the expense of domestic cultural capital (Gunjebo et al., 2025). To rectify these historical imbalances and improve basic educational quality, the Ministry of Education has enacted major reforms. The Ethiopian Education Development Roadmap 2018–2030

(T. Teferra, A. Asgedom, J. Oumer, T. W/hanna, 2018), the General Education Curriculum Framework of Ethiopia (Ethiopian Federal Ministry of Education, 2020), and the recent Education and Training Policy (MoE, 2023), explicitly mandate the integration of indigenous values and traditional practices into the primary school curriculum. These policies aim to create an inclusive, sustainable educational system where localized knowledge systems complement modern scientific learning. However, while national policies strongly encourage this integration, the precise extent to which these directives have been operationalized within classroom materials remains largely unassessed.

1.2 Theoretical Framework: Two-Eyed Seeing and Culturally Responsive Pedagogy

This study is theoretically grounded in Culturally Responsive Pedagogy (CRP) and the concept of "Two-Eyed Seeing" (TES). Two-Eyed Seeing, conceptualized as a curriculum framework, advocates for the authentic and complementary integration of Western and indigenous knowledge systems. Rather than viewing these frameworks as contradictory, TES suggests that educators and students learn to see from one eye with the strengths of indigenous knowledge and from the other eye with the strengths of Western knowledge, using both eyes together for the benefit of all. This approach aims to harmonize distinct worldviews by intentionally designing instructional materials that bridge the gap between indigenous ecological insights and Eurocentric scientific standards (Lithuania, 2015).

However, current textbook analysis literature suffers from a notable theoretical and analytical limitation. Most existing studies evaluate the inclusion of indigenous content using a binary approach measuring its presence or absence rather than examining its curriculum positioning and learning organization. A significant theoretical gap exists regarding how CRP and TES can be collaboratively operationalized to examine whether indigenous knowledge is treated as a valid, complementary system or merely included as supplementary, illustrative filler within a dominant Western epistemology. The field lacks definitive analytical explanations of how textbooks convert local IK into meaningful learning activities, how cross-cultural meanings are constructed, and how learning exercises enable primary students to switch between or combine both perspectives (Cirkony et al., 2023).

Consequently, TES is frequently invoked as a broad guiding principle without a well-integrated framework to critically assess a textbook's epistemic framing and pedagogical alignment.

1.3 Identifying the Problem

This systemic curricular gap is highly apparent in the Hadiya Zone of the Central Ethiopia Regional State. The Hadiya people possess a distinct cultural identity rooted in profound historical, social, and linguistic foundations (Braukämper, 2019). Over generations, the Hadiya community has developed a comprehensive body of Hadiya Indigenous Knowledge (HIK) that has allowed them to maintain socio-ecological balance within their environment. This rich local knowledge system spans multiple vital domains, including: *Agricultural and Ecological Practices*: Complex multi-cropping methods, livestock husbandry, pest management, and the sustainable cultivation and processing of *Enset* (false banana) a foundational crop for food security and soil conservation in the region, *Ethnobotany and Traditional Medicine*: The systematic classification, preparation, and administration of local medicinal plants to treat human and animal illnesses, *Material Culture and Craftsmanship*: Indigenous technologies such as iron smelting, pottery, leather processing, and weaving, *Socio-Political Governance*: Traditional democratic administrative structures, civic dispute resolution mechanisms (such as *Landmacho/Landisikka* and *Xiigulla*), and localized wealth-sharing or funeral cooperative systems (*Ekub* and *Iddir*), *Sociocultural Rituals and Calendars*: Advanced celestial and environmental observation systems used to predict weather patterns, alongside major cultural milestones like the *Yahode Masqal* (New Year celebration) and *Laro Xibbima* (a ceremonial counting ritual for cattle owners) (Gunjebo et al., 2025).

Despite the demonstrable socio-ecological value of these HIK elements, they remain largely unmapped and disconnected from formal primary school curriculum in the Hadiya Zone. Westernized primary education models prioritize secularized, standardized scientific knowledge, often failing to construct meaningful linkages between native worldviews and school curricula. This exclusion threatens to alienate young learners from their community identity while undermining national efforts to build culturally inclusive schools. Because primary school textbooks heavily shape early cognitive frameworks, an empirical assessment of how local knowledge is

embedded in foundational instructional materials is critically needed (Dungdung, 2026).

This study addresses these gaps through an in-depth, sequential two-phase quantitative and qualitative research design focused on the primary level Environmental Science and Performing and Visual Arts textbooks utilized within the Hadiya Zone.

Phase 1 consists of a comprehensive content analysis evaluating how HIK is represented across textbook content selection, imagery, examples, proverbs, and project work. Phase 2 builds directly upon those baseline findings to investigate the underlying systemic, institutional, and cultural factors that constrain the effective integration of indigenous knowledge into primary curriculum. By identifying where these materials succeed or falter in validating indigenous perspectives, this study seeks to provide actionable, evidence-based recommendations for regional curriculum designers, policymakers, and educators striving for equitable and culturally responsive educational outcomes in Ethiopia. Thus, the researchers felt that this study is relevant and opportune to demonstrate approximately the recent incorporation of HIK into the primary curriculum, which the earlier exploration did not tackle in the study area, and the topic isn't thoroughly examined.

1.4. Objectives

The main objective of this study was to examine the integration of *Hadiyya* indigenous knowledge into the primary school curriculum. Specifically, the study will help:

1. To examine how Hadiyya indigenous knowledge is incorporated into the primary school curriculum.
2. To evaluate the extent of alignment between curriculum materials regarding the integration of indigenous knowledge.
3. To identify the factors that impede the effective integration of indigenous knowledge into primary school textbooks.

1.5. Research Questions

The study answers the following research questions:

1. How *Hadiya* indigenous knowledge is incorporated into the primary school curriculum;
2. How far the curriculum materials (textbooks & syllabi) are aligned concerning the integration of IK;
3. What factors impede the effective integration of indigenous knowledge into primary school textbooks?

1.6. Significance

This study provides practical, theoretical, pedagogical and policy implications for the advancement of culturally responsive education within the study area. It also serves as a critical diagnose tool for regional education bureaus and curriculum developers, providing empirical evidence to bridge the gap between idealized education and actual classroom materials. Furthermore, by identifying the systematic, administrative, and structural factors that impede the effective integration of local knowledge into textbooks.

2. Research Methods

2.1. Research Design

A sequential explanatory design was utilized to examine the data through a systematic exploration of existing primary curriculum materials such as syllabi and textbooks in a particular two-phase sequence. Phase 1 consists of a comprehensive critical content analysis evaluating how HIK is represented. Moreover, it assesses the depth, tone, and context in which textbooks are presented to establish baseline information regarding organization and structure, the clarity of concepts, the equilibrium between indigenous and Western knowledge qualitatively (*Guru Shishya Parampara - Tabla Houston*, 2026).. Phase 2 builds directly upon those baseline findings to investigate the underlying systemic, institutional, and cultural factors that restrain the effective integration of indigenous knowledge into primary curriculum through conducting curriculum designers' interviews to clarify the underlying reasons for those outcomes.

2.2. Sources of Data

The data were collected from both primary and secondary sources to obtain triangulated pertinent information regarding the incorporation of Hadiya's indigenous knowledge within the primary school environmental science and performing and visual arts curriculum. Regarding determination of sample size, (W.Creswell & N.Poth, 2018) highlighted that the size of the sample depends on the nature of the research questions to be answered and the data to be collected. To this end, primary school selected textbooks and curriculum designers were the sources of data to this study.

2.3. Participants and Sampling Techniques

This study examines textual data to uncover themes and patterns regarding the representation, integration, or exclusion of IK. To achieve this, the evaluation focus on examining the integration of HIK into school curricula and the alignment of curriculum materials (textbooks and syllabi). For this purpose, 8 curriculum designers, with 4 from each subject area, took part from various secondary schools, Wachemo University, and Hosanna College of Education. The selected curriculum designers have more than 12 years' experience in their respective disciplines, and they were BA and MA/MS holders.

2.4. Data Collection Tools

The data collection tools were critical content analysis of textbooks in phase one, and interviews in phase two. The researchers created the assessment rubric to examine the curriculum materials analysis frameworks suggested by (Solórzano & Yosso, 2002) and (Hobbs, 2024), concentrating on assessing the incorporation of different aspects of HIK into textbooks for primary schools. Therefore, competencies, contents, activities, projects, examples, illustrations, figures that represent IK were employed as review tools. In addition, the researchers prepared semi-structured interview guides in English. After developing the evaluation rubrics and interview guide, validity and trustworthiness were maintained using experts review. The review was made by four experts review who had PhD degrees, professors and have plenty of experiences on educational fields and curriculum validation.

2.5. Trustworthiness of the Data

The researcher utilized the four interconnected and dependent methods of data credibility, dependability, transferability, and conformability (Kakar et al., 2023) to guarantee the validity of the study results. The stated quality criteria were satisfied by employing various data collection methods, several participants, and a theoretical framework to direct the data gathering and analysis. Ultimately, the research employed the participants' real narratives and offered a comprehensive description of thematic data analysis. This in turn help guarantying the authenticity and accuracy of the data, minimizing the potential bias, and promote the application of verification strategies such as member checking and drawing multiple evidence sources (Cohen et al., 2009).

2.6. Ethical Consideration

Consistent with the guidelines of (Thornhill, 2019), informed consent was obtained from all study participants. They were clearly articulated on the aims of the study, the intended use of their responses, and the assurance that no personal or institutional data would be disclosed. The introductory part of the interview guide focus on the information collected would be treated confidentially. Respondents were given chance to ask questions and get clarity before providing consent. Contextualization of maltreatment in the framework of research misconduct is very crucial. (W.Creswell & N.Poth, 2018) to secure data. The severe ethical values were observed to ensure the protection, respect and sovereignty of all members. Based on the suggestions of (Thornhill, 2019), pseudonyms were used instead of participant's real names to protect their identity and to maintain the confidentiality of the data. Accordingly, they were given the pseudonyms as follows: ENVSCD 1_4 (designers of environmental science curricula) and PVACD 1_4 (designers of performing and visual arts curriculum. Before data collection began, the researchers received official research ethical clearance from the institutional research ethics committee of the college of education of Hawassa University, Ethiopia (Ref. No. COE-REC/023/2025, Date: October 24, 2025. Hence, the researchers use the data of respondents only for the research purposes.

2.7. Methods of Data Analysis

Critical content analysis was represented across textbook content selection, imagery, examples, proverbs, and project work that mainly emphasize quantifying occurrences, pages or space allocations and exploring the deeper representational aspects of the content in quantitative terms. The information gathered from the interviews undergoes a structured coding and analysis procedure. The primary themes and ideas that surfaced from the transcripts were reviewed in the text, emphasizing significant phrases, concepts, and trends. Codes were classified into categories based on their relationships and similarities, followed by a thematic analysis where identified themes were explored to uncover deeper insights.

Criteria for Assessing the Incorporation of Indigenous Knowledge into curricula

The rubric outlines four criteria that consist of essential dimensions of CRP and TES for analyzing textbooks: cultural representation, cultural relevance, knowledge integration, and the pedagogical approach, along with empowerment and critical consciousness, which were developed based on categorized cultural aspects. *The detail is attached as annex-1.*

The researchers established a four-level scale (1= minimal, 2= additive, 3= moderate, and 4= high) that clarifies the extent of integration of IK, indicating if it is only referenced, fairly connected to the content, or thoroughly ingrained. *The detail is attached as annex -2.*

The detailed scoring rubric for assessing the incorporation of IK into textbooks based on a CRP offers distinct descriptions for levels 1-4, with the Two-Eye-Seeing approach used methodically to guarantee consistent coding. *The detail is attached as annex-3.*

The scores indicate the level of integration through ranges of average mean as 0-25=minimal, 26-50=additive, 51-75=moderate and 76-100 is high integration. *The detail is attached as annex-4.*

3. Findings of the Study

3.1. Results of content Analysis

The study reviewed the infusion of IK into the selected primary textbooks. The research aimed to answer the following research questions. (1) How is Hadiya's indigenous knowledge addressed in primary school curriculum? (2) How far the curriculum materials (textbooks & syllabi) are aligned in terms of IK integration?

Research question; 1 the detailed review results of environmental science and performing and visual subjects are presented as follows;

Table 5: The Integration of Indigenous Knowledge into the Primary Textbooks

Coding excerpt of Environmental Science and PVA Subjects

Dimensions	Guiding questions	Level (1–4)					
		Envir Science			PVA		
		4 th	5 th	6 th	4 th	5 th	6 th
TES- Indigenous Knowledge (IK) Content	Are IK topics included in the content	2	2	1	1	1	2
	Is the IK contents represented in depth, with explanation and multiple examples?	4	2	1	1	1	2
TES-WK Content	Is the IK content accurate and authentic?	3	1	1	1	1	1
	Are indigenous perspectives treated as valid knowledge, not inferior?	2	1	1	2	1	1
	Do the lesson topics clearly articulate the two forms of knowledge system?	1	2	1	1	1	1
Cultural Relevance	Do textbooks reflect students' local context, daily life, and community practices?	2	2	2	2	2	2
	Is the local language, symbols, stories, or illustrations used?	2	1	1	2	2	2
	Are students lived experiences included as part of learning activities?	1	1	1	2	2	2
	Does the textbook link global knowledge to local experiences?	1	2	1	1	1	1

	Does the curriculum represent the racial, ethnic, and cultural backgrounds of the students'? (cultural inclusivity)	2	1	1	2	2	2
	Does it help learners relate new concepts to their own cultural backgrounds?	1	1	1	1	1	1
Knowledge Integration	Do the materials provide guidance for culturally responsive teaching (suggested activities, discussion prompts, and local examples)?	2	2	1	1	1	1
	Do activities foster critical thinking about knowledge systems?	1	1	1	2	1	2
	Does the text present IK as complementary or inferior to WK?	2	1	1	1	1	1
	Are students encouraged to investigate indigenous practices or wisdom?	1	2	1	1	1	1
TES-Integration Opportunities	Are there explicit links or comparisons between IK and WK?	1	2	1	1	1	1
	Do lesson activities encourage students to connect IK with Western concepts?	1	2	1	1	1	1
Cultural Representation	Does the textbook cover have images showing indigenous culture/traditions?	1	1	1	1	1	1
	Do the contents promote authentic engagement/participation from elders, tribal professionals, parents, and community members in teaching & learning activities?	1	1	1	2	1	2
	Do the contents reflect the local community's' key cultural elements such as; yahodee masqala (Hadiya New Year) and related ceremonies, conflict management practices (xiggulla (homicide reconciliation), landmacho (traditional women's dress), enset, traditional herbal healings for humans and livestock, laro xibbima (cattle counting 100+), proverbs (yanna), natural resources conservation (uumoi amaxxa abooyimma), agriculture (abuula), craftwork skills; woqqaacooma (iron melting), do'l baxo (pottery), sheemaaneoo'm baxo (weaving), omacho duugima (tanning), wood work), cultural Practices, food and beverage production & preservations, financial management, social structure and governance (mine, moollo, giiraaa giichcho), Language, time measurement and forecasting weather condition/ natural phenomena observation), weeding (kiiffaa illimocha), edir (communal help organizations), working habit (gejja baximma), home making, qarassima (decantation), goolisimma (distillation), hiraaga etc.	2	2	1	2	2	2
	Do project works and activities incorporate elements of IK represented	2	1	1	2	2	2

	through graphic organizers (maps, charts, pictures, and proverbs)?						
	Are indigenous people represented as active knowledge holders?	1	1	1	2	1	2
	Is IK treated as valid science or as folklore?	1	1	1	1	1	1
Empowerment	Does the textbook empower learners' to value and sustain their culture?	2	1	1	1	1	1
	Does it challenge stereotypes or Eurocentric dominance?	1	1	1	1	1	1
	Total mean score (out of 100)	40	35	26	35	31	36

0-25 Minimal integration, 26-50 Emerging integration, 51-75 Moderate integration, 76-100 High integration

Detailed summary of the analytic rubric of each dimension based on indicators and level of score in per unit, chapter, theme or the whole textbook is portrayed as follows; the primary school environmental science textbooks of grades 4, 5 & 6 with the cumulative scores 40, 35 and 26 respectively. The results showed under the scale of 26_50 which is emerging/additive integration. This means certain examples of IK are mentioned fragmentally but not systematically connected to the learners' context. Similarly, the primary school PVA textbooks of grades 4, 5 & 6 were analyzed and yield 35.31 & 36, respectively that showed the integration is additive or emerging integration.

3.2. Integration of HIK in Primary School Environmental Science

Summary of analytical rubric of each dimension based on indicators and level of scores per unit, chapter or the whole textbook

Table 6: Analysis of Grades 4, 5 & 6 Environmental Science for Integration of IK

No	variables/contents			Total			IK Representation			IK percentage		
Grade Level												
				4 th	5 th	6 th	4 th	5 th	6 th	4 th	5 th	6 th
1	Learning competencies			41	56	52	3	5	4	7	9	8
2	Activities and Group works			110	36	48	25	10	7	23	28	15
3	Pictorial examples	Illustrations	&	130	91	66	23	34	9	18	37	14
4	Exercises questions	and	Review	37	34	22	12	13	6	32	38	27
5	Total			318	219	188	67	65	24	21	30	13

As detailed in Table 6, Indigenous Knowledge (IK) integration within the Grade 4 curriculum is highly constrained, appearing in merely 3% ($n = 7/41$) of the learning objectives. This restriction in scope and frequency persists across Grades 5 and 6. Although pedagogical activities demonstrate marginal improvement in Grade 4 at 23% ($n = 25/110$), they still lack meaningful integration with local contexts—a pattern consistent across the comparable activity structures of Grades 5 and 6. Pictorial representations and contextual examples similarly exhibit low localized relevance, with

IK accounting for only 18% ($n = 23/130$) of visual content in Grade 4, while Grades 5 and 6 reflect an equivalent absence of culturally pertinent imagery. Conversely, Grade 4 exercises and review questions demonstrate a relatively higher IK representation at 32% ($n = 12/37$); however, the broader curricular representation in Grades 5 and 6 remains minimal.

Overall, the analyzed curriculum objectives infrequently address localized cultural practices, such as traditional food preparation and indigenous preservation methods. For example, Unit 2 of Grade 4 Environmental Science introduces objectives for students to "describe cultural cuisines and their methods of preparation" (p. 44), while Unit 3 targets "methods for conserving natural resources through indigenous knowledge" (p. 88). In Grade 5 Environmental Science, Unit 1 features only a single IK-focused objective regarding natural resource conservation. Furthermore, the Grade 5 Environmental Science curriculum references broader Ethiopian cultural elements (pp. 76–82) and diverse endemic species (pp. 101–102), while the Grade 6 curriculum isolates IK to a single objective on distinguishing "East African traditions" (p. 111).

Within the Performing and Visual Arts (PVA) curriculum, Units 3 and 4 for Grade 4 incorporate explicit IK learning objectives, requiring students to "demonstrate cultural dance through indigenous knowledge, value cultural dance, and explain the process of creating a cultural home" (p. 114). In contrast, Grade 5 (Unit 3) restricts this to the objective "distinguish between local and national music, dance, and movement" (p. 86). Grade 6 (Unit 3) requires students to demonstrate and perform with cultural musical instruments according to rhythm (p. 91). Collectively, these trends indicate that almost all foundational learning objectives exclude substantive pedagogical frameworks of indigenous epistemologies.

Regarding thematic integration, Unit 1 of Grade 5 Environmental Science addresses traditional seed storage (p. 32) and distance measurement (p. 40). Unit 2 incorporates soil preservation (p. 73), natural resource conservation (p. 76), and traditional soil conservation techniques (pp. 79–80). Unit 4 integrates broader cultural elements (p. 111), Ethiopian culture and language (Sections 4.1.2, pp. 114–115), and heritage (Section 4.1.4, p. 117). Activity 4.2 (pp. 119–120) prompts student reflection on

environmental heritage, while Sections 4.1.5 and 4.1.7 (pp. 120–130) highlight intangible and tangible indigenous practices, highlighting localized institutional frameworks such as *edir* (community support groups), *ekub* (savings groups), *sheemaato* (weaving), and *xiiggulla* (mediation). Additionally, the curriculum contrasts traditional and modern agricultural harvesting techniques (p. 133). Section 4.1.12 focuses on industrial applications (p. 140), where Activity 4.1.4 allows students to compare the two knowledge systems, and Task 4.3 (p. 144) prompts learners to identify indigenous industries within their immediate vicinities.

Finally, the Grade 6 Environmental Science curriculum integrates discrete indigenous components. Unit 2 illustrates the composition and separation of mixtures using localized examples of decantation and distillation (p. 60), supported by Activity 2.5 (Section 3), which prompts students to discuss surrounding indigenous elements (p. 65). Within the instructional context of soil erosion, the textbook details how local communities deploy indigenous knowledge to combat degradation, supplemented by Activity 3.3 to encourage community-based experiential learning (p. 107). Furthermore, Unit 4 (Activity 2) provides an interactive framework for students to discuss heritage and solicit information from parents and local elders (p. 138). Section 4.7 extends this to East African industries (pp. 154–155) by categorization and provision of explicit indigenous practices, including *sheemaaxxi baxo* (weaving), *do'l baxo* (pottery), *woqqaacooma* (iron melting), and *omachcho duugimma* (tanning) to represent IK elements.

Table: 7 Analysis of Grades 4, 5 & 6 PVA subject for integration of IK

No	variables/contents	Total	IK Representatio n	Grade Level						IK percentage		
				4 th	5 th	6 th	4 th	5 th	6 th	4 th	5 th	6 th
1	Learning competencies	21	14	16	5	2	3	24	14	19		
2	Activities and Group works	24	13	37	9	2	12	38	15	32		
3	Pictorial Illustrations & examples	94	101	114	9	14	30	10	14	26		
4	Exercises and Review questions	40	37	22	12	9	12	30	24	55		
5	Total	166	172	189	31	29	56	0.2	17	30		

As detailed in Table 7, An analysis of grade 4-6 Performing and Visual Arts (PVA) textbooks indicates a minimal integration of Indigenous Knowledge (IK), with only 22% of total content (116 out of 527 elements) highlighting IK. While Grade 4 and 5 texts include specific examples of cultural ceremonies, traditional attire, and local technologies, Grade 6 exhibits a below-average 30% inclusion rate. The findings suggest a continued imbalance between traditional and western knowledge systems, necessitating greater representation of indigenous knowledge. Additionally, on page 48, section 2.2 of grade 4 PVA, activities 2.1 and 2.2 are effectively crafted to encourage learners to elaborate on their IK elements connected to cultural marriage and funeral ceremonies. Specifically, Activities 2.1 and 2.2 engage learners with cultural marriage and funeral traditions, while Section C (p. 88) utilizes illustrations of local conflict resolution. Heritage-based tasks (Activity 3.4) and dramatic explorations of community mediation (Activities 3.8–3.9) further anchor this integration. Section 4.1 (p. 106) incorporates local proverbs (“ሲሮጡ የታጠቁት ሲሮጡ ይፈታል / geellichcha ladeakoi ladimi geelichchanemi tiramookko”), architectural imagery (p. 115), traditional musical performance (p. 122), visual depictions of the yaahodee masqala Hadiya New Year (p. 124), and culminating review inquiries (p. 129).

The Grade 5 PVA textbook integrates IK through defensive artifacts (*agiraa* and *bagado*, pp. 69–70) and traditional Hadiya attire (p. 73). Unit 3 details cultural lifestyles, songs, and oral histories via intergenerational community dialogues (Activity 3.1, p. 79; pp. 79–83). Section 3.3.2 highlights *weesa* (Enset) cultivation and derived traditional foods (*waasa*, *atakana*, *mucho*, p. 100), complemented by community-based discourse on conflict resolution and celebrations (Activity 3.3, p. 101). Unit 4 extends this via localized industrial arts, including pottery, weaving, tanning, and iron smelting (pp. 104–109).

For Grade 6 PVA, Table 7 indicates that IK elements account for 30% ($n = 56/118$) of total activities and illustrations. Unit 1 features indigenous musical instruments, historical conflict-resolution assemblies, and marriage rites (pp. 79–83), while Unit 4 examines regional arts, community holiday interpretations (*uguda heebbishsha*), and traditional dances (pp. 107–117).

Overall, across the Grade 4–6 PVA curriculum, IK components constitute only 22% ($n = 116/527$) of the 527 evaluated pedagogical elements, objectives, and activities. This minimal representation underscores the systemic need for deeper curricular balance between indigenous epistemologies and dominant frameworks.

3.3. Alignment among Curriculum Materials Regarding the Integration of IK

The correspondence between the syllabus and the textbooks is essential for confirming that the desired learning competencies are taught and absorbed effectively. The table 8 below examines the consistency between the syllabus and textbooks for the specified subjects and grade levels. Therefore, examining the connection between syllabus competencies and the educational components found in the textbooks while evaluating alignments regarding the percentage of competencies addressed by the contents of the textbooks. It addresses inquiries such as “How much do textbooks represent the learning competencies outlined in the syllabus?” Consequently, the competencies in textbooks were examined in relation to the syllabus competencies to determine their alignment and classify the type of match (full, partial, none).

Table: 8 Alignment of Curriculum Materials Vis-à-vis IK Integration

Subject	Grade level	Syllabus			Textbook		
		Learning competencies	IK related competencies		Learning competencies	IK related competencies	
			No	%		No	%
Environmental Science	4 th	50	6	12	41	3	7
	5 th	54	7	13	56	5	9
	6 th	56	5	9	52	4	8
PVA	4 th	12	2	17	21	5	24
	5 th	13	0	0	14	2	14
	6 th	10	0	0	16	3	19

According to the findings, competencies related to IK are present in the syllabus and textbooks across the three grade levels, although their representation differs. In the 4th grade, the syllabus shows 6 out of 50 (12%) while the textbook shows 3 out of 41 (7%), suggesting that the textbook has fewer IK pedagogical elements compared to the syllabus. For instance, in chapter two (p. 21), “students talk about cultural foods and how they are prepared” in the textbook and syllabus, in chapter three (p. 67), “cultivate the skill of conserving natural resources through Indigenous wisdom.” The other one and three do not indicate any competencies related to IK. In terms of 5th grade, the syllabus showcases 7 out of 54 (13%) competencies compared to 5 out of 56 (9%) in the textbook, suggesting that the textbook is still trailing the syllabus. For instance, in chapter four (p.111) of the textbook, competencies such as “mention different cultural aspects” and “elaborate different languages and heritages” are identified as IK-related; however, the other three units (units 1, 2, and 3) lack any IK-related pedagogical components in both the textbook and the syllabus. Ultimately, for 6th grade, the curriculum shows 5 out of 56 (9%), while the textbook indicates 4 out of 52 (8%), suggesting the alignment is quite similar, although the textbook still falls a bit short. For illustration purposes, in unit four (p. 133) “explain different heritages and their economic advantages”, but the rest units (units 1, 2, 3, & 6) do not mention any IK related competencies in both textbook and syllabus,

Regarding PVA, the alignment is minimal in the syllabus for both 5th and 6th grades, with IK related pedagogical elements not represented (0% in each case). Conversely, the textbooks show non-zero IK coverage. In 4th grade, the syllabus indicated 2 out of

12 (17%), whereas the textbook represented 5 out of 21 (24%), suggesting that textbooks include a greater percentage of IK-related teaching components compared to the syllabus. For instance, in unit 3 (p.83) mentioned as “show indigenous dances utilizing indigenous knowledge” and in unit four, (p. 104) “understand how native populations construct cultural homes” are examples of learning competencies that demonstrate IK. Regarding grade 5, the textbook and syllabus outline competencies; however, only unit five of textbook 2 demonstrates IK related competencies. In 5th grade, the curriculum shows 0 out of 13 (0%) while the textbook indicates 2 out of 14 (14%). Similarly, in 6th grade, the syllabus shows 0 out of 10 (0%), whereas the textbook displays 3 out of 16 (19%). For instance, unit 4 (p.107 _ 108) mentioned that “by utilizing indigenous knowledge visual art, students can exhibit cultural dancing,” and “by employing indigenous musical instruments, they can represent cultural musical dancing.”

3.4. Findings from Interview Regarding the Incorporation of IK into Curricular materials

The modifications in the curriculum presented practices and challenges to curriculum developers regarding the necessary focus curriculum design should have received. The existing education and development Roadmap, the New Education and Training Policy, General Education Curriculum Framework, along with associated directives and declarations, are advocating for the incorporation of IK into curricula. Nonetheless, the difficulty is in helping curriculum developers create this curriculum.

3.4.1. Theme 1: Institutional Capacity Constraints and Theoretical Deficits in IK Integration

The first phase of the qualitative inquiry revealed that while policy documents mandate the inclusion of indigenous knowledge, curriculum designers face severe technical and capacity-related limitations. A primary structural barrier identified by informants was the political interference in pedagogical execution, coupled with insufficient professional training. As noted by one Environmental Science designer:

"At the onset of the development process, [authorities] provided guidance indicating that training and the entire development procedure is directed by politicians, who aimed to offer direction to ensure completion within the specified time and to restrict the number of pages from exceeding the limit." (Interview, ENVSCD-1, February 3, 2026)

This political imposition directly compromised the pedagogical depth of the curriculum. Informants consistently emphasized that the brief orientations they received failed to equip them with the necessary theoretical framework required to transition from insincere content inclusion to genuine epistemic integration. Elaborating on this practical deficit, a Performing and Visual Arts designer observed:

"The training received was insufficient and failed to provide us with the theoretical and practical skills needed to incorporate IK into curriculum materials, such as structuring IK learning competencies, organizing content and developing learning activities. Lacking adequate focused training, we find it difficult to effectively utilize IK, resulting in superficial inclusion instead of genuine integration." (Interview, PVACD-3, April 21, 2026)

This structural lack of clarity extended to basic conceptual definitions. Designers were left without standardized benchmarks to determine what structurally constitutes HIK, where it should be positioned within a unit, or how teachers should operationalize it. This conceptual ambiguity was summarized by ENVSCD-7:

"The primary obstacle was insufficient training regarding the clear definition of IK concerning what constitutes IK, its fundamental components, and methods of incorporating IK (including place and position), suitable subjects and grade levels, as well as how to structure IK-related content and activities for teachers and students, along with a lack of reference materials..." (Interview, ENVSCD-7, April 29, 2026).

3.4.2. Theme 2: Project-Based Timelines and Compressed Design Cycles

Beyond capacity deficits, the structural organization of the curriculum development process was constrained by rigid, project-based timelines. Participants noted that the regional state education apparatus allocated a highly compressed timeframe of merely 45 days to execute the entire development phase of integrating IK. Reflecting on this constraint, a designer for grades 4–6 stated that *"the integration of the IK component into curriculum development is pursued within a constrained design and review timeline,"* indicating that while organized institutional efforts exist, the severe duration constraints directly threaten the overall quality of the output (Interview, ENVSCD-1, April 29, 2026).

This compressed timeline effectively eliminated the possibility of field-testing or community verification—steps that are essential for authentic indigenous representation. The broader pedagogical implications of this rushed timeline were articulated by the PVACD-2 informant group:

"Time limitations hinder opportunities for creating and verifying IK-related materials, pinpointing trustworthy IK components, crafting suitable learning experiences, and performing comprehensive evaluations... This compressed timeline could lead to rushed outcomes and insufficient involvement from stakeholders needed for IK to be accurately contextualized." (Interview, PVACD-2, April 21, 2026)

Ultimately, this rapid operational cycle alienated the primary custodians of the knowledge systems being integrated. Because indigenous epistemologies rely heavily on community validation, rushing the design process severed the link between academic curriculum teams and local elders. As one environmental science curriculum developer concluded:

"The limited time available for gathering validated indigenous knowledge from community holders can diminish the richness and quality of the locally sourced knowledge essential for effective curriculum creation; hence, organized community involvement required for obtaining precise and contextually

appropriate indigenous knowledge is hard to realize." (Interview, ENVCD, April 29, 2026).

3.4.3. Theme 3: Scarcity of Codified and Documented Indigenous Knowledge Repositories

A critical structural impediment identified by the majority of curriculum designers was the acute shortage of well-documented, systematically codified, and officially authenticated indigenous knowledge elements suitable for direct pedagogical application. While policy frameworks mandate the integration of local heritage, the absence of written source materials forces curriculum developers to operate without an empirical baseline. This operational challenge was explicitly highlighted by the primary level Performing and Visual Arts design team: *"The groups faced significant challenges due to insufficient clear content references that could be directly applied or adapted to primary school Performing and Visual Arts subject contexts."* (Interview, PVACD-1, April 29, 2026).

This lack of documented material creates severe pedagogical and cognitive uncertainties during the curriculum construction process. Without authenticated, peer-reviewed, or community-approved reference texts, designers struggle to gauge the accuracy, epistemic boundaries, and cultural safety of the information they intend to introduce. Furthermore, the absence of organized repositories severely complicates the task of developmental scaffolding making it difficult to align local traditions with the early cognitive development of young learners. Reflecting on these multi-layered struggles, an Environmental Science curriculum designer noted:

"Due to the absence of well-documented IK pedagogical elements in usable formats, we struggle to determine what to include, how to adjust it, where to integrate it for learners' cognitive levels and contexts, and how to guarantee its accuracy and cultural significance." (Interview, ENVSCD-3, March 26, 2026).

4. Discussion

This study employed a sequential mixed-method design combining systematic textbook reviews with key informant interviews to examine the epistemic positioning and integration of HIK into the primary school curriculum within the Central Ethiopia Regional State.

4.1. Quantitative Curricular Discrepancies and Epistemic Imbalances

The quantitative content analysis reveals severe structural deficiencies in the pedagogical operationalization of HIK across all analyzed units of analysis, including learning competencies, classroom activities, imagery, examples, and review exercises. Specifically, the inclusion of HIK across environmental science textbooks was uneven and minimal, accounting for only 21% in Grade 4, 30% in Grade 5, and 13% in Grade 6. This marginalization was even more pronounced in the Performing and Visual Arts (PVA) textbooks, where HIK components drop to a negligible 0.2% in Grade 4, before rising slightly to 17% in Grade 5 and 30% in Grade 6.

These findings demonstrate that the reviewed textbooks remain overwhelmingly anchored in Western epistemological frameworks, systematically outperforming and eclipsing indigenous cultural knowledge systems. This empirical reality contradicts the (Ethiopian Federal Ministry of Education, 2020) that recommends the inclusive educational mandates outlined in the General Education Curriculum Framework of Ethiopia. It supports recent scholarship (Yeseraw et al., 2023) indicating that despite modern curriculum reforms, contemporary educational materials fail to adequately contextualize and institutionalize the values and knowledge systems of indigenous populations. Globally, this structural exclusion aligns with observations by UNESCO, which identified pervasive logistical, social, and political barriers that stymie the integration of indigenous content into formal pedagogy, often because localized cultural assets remain largely inaccessible or misunderstood by textbook writers.

4.2. Practical Manifestations of Omission and Misrepresentation

A granular qualitative audit of the text material exposes missed curricular opportunities to bridge the gap between indigenous ecological insights and Eurocentric scientific standards. For instance, in the Grade 4 environmental science textbook (Unit 1), spatial navigation concepts are introduced using abstract spatial frameworks, neglecting to explicitly anchor orientation competencies in native Hadiya spatial orientations or clear somatic references (such as localized directional hand and body positioning). More critically, the text completely overlooks the region's socio-ecological backbone: *Enset* (false banana) agriculture. The curriculum fails to include interactive learning activities regarding *Enset* reproduction or the processing of its essential traditional derivatives like *waasa*, *atakana*, *mucho*, and *ha'mmicho*. In this regard, (UNESCO, 2021) found that numerous logistical, social and political barriers to inclusion of IK related pedagogical components in education were identified. Moreover, (McDowell et al., 2025) suggested that cultural knowledge may not be readily available to or understood by textbook writers.

Similarly, Unit 2 fails to incorporate indigenous celestial and solar observation techniques traditionally used by Hadiya communities to estimate time. In Unit 3 (p. 69), the text neglects soil conservation and erosion management strategies. In sub-content 4.3.1.2 (animal rearing), the text completely omits the culturally significant *laro xibbima/wogena* ceremony a traditional socio-economic milestone celebrating the ownership of over 100 cattle.

Furthermore, serious ideological and terminological issues were observed. On page 120, the Grade 4 environmental science text introduces traditional industries (*Geyo industire'e*) such as weaving (*sheemaane'e*), pottery (*do'l baxo*), iron smelting (*xaara tumimma*), and tanning (*omacho duugimma*) without providing any accompanying visual or pictorial illustrations of the processes and products. Problematically, the curriculum designates these sophisticated indigenous socio-technological practices under the pejorative and Eurocentric label "*lasgat*" (backward/backward-oriented industry), actively undermining the validation of indigenous epistemologies.

In the Grade 5 textbooks, this trend of cultural displacement persists. Unit 1 excludes traditional seed preservation and indigenous agronomic storage methods, and relies solely on Western SI metrics for distance, excluding familiar local units of measurement like the *hand*, *span*, *arm span*, *foot*, and *cubit*. Furthermore, while the text incorporates broad regional celebrations like the Oromo *Irreecha* and Sidama *Fichee-Chambalaalla*, it totally omits the *Yaahodee Masqala* (the Hadiya New Year), depriving local learners of familiar cultural reference points.

In Unit 2 (p. 60), the discussion of chemical and physical mixtures fails to leverage local practices, such as the traditional decantation used in coffee brewing or the distillation processes involved in producing *Tella* and *Areke*. In the forestry section (p. 126), the text fails to document the region's rich ethnobotanical heritage, ignoring vital indigenous medicinal plants such as *zigiba/digiba*, *bisaana/masanna*, *weera/woyira*, *hooma/tsid*, *wora'a/korch*, *suuxo/kosso*, *qadaal baarzaafa*, *minaantoofa*, *caaroota*, *wodeesha*, and *baarawa*.

In the Grade 5 PVA textbook (Unit 3, pp. 95–97), contextual relevance is similarly compromised by introducing the *Gamoo yoo masqala* instead of the local *Hadiyaa Yahooodee masqala*. In sections addressing conflict resolution, the text utilizes external Gamo examples while ignoring established Hadiya juridical and administrative structures, such as *xiigulla* (blood compensation and reconciliation), *landimacho* (the institutionalized involvement of women in dispute resolution), and traditional governance organizations (*mine-moollo-giiraa-giichcho*). Finally, the textbook's examples of historic heroes rely on generalized figures; failed in integrating transformative local environmental and socio-political champions like Gejja Garbo, Professor Beyene Petros, and Colonel Bezabih Petros would far more effectively inspire students and foster historical identity.

4.3. Theoretical Implications for Knowledge Integration

To address these pervasive imbalances, current literature stresses the necessity of moving away from an assimilative educational approach to a complementary one, where Western and Indigenous knowledge systems are valued equally. Grounded in the concept of "Two-Eyed Seeing" (TES), a balanced curriculum should unify both

worldviews to enhance the cultural, historical, and identity significance for local learners. Merging traditional ecological knowledge with modern standards bridges the gap between local cultural context and global expectations, significantly enriching the early cognitive learning experience.

However, the textbook-syllabus alignment analysis reveals a severe systemic fracture in how these objectives are operationalized. In environmental science, while the representation of HIK is fairly uniform across both documents, the textbooks consistently dilute the IK competencies outlined in the syllabus, with the narrowest gap occurring in Grade 6. In the PVA curriculum, the alignment is entirely fragmented: after Grade 4, the official syllabus eliminates IK coverage completely, leaving textbooks to include scattered, unguided references to traditional skills. In this regard, (Cindi, 2016) proposed that integrating indigenous and Western knowledge systems can offer a more comprehensive and contextually relevant education. Similarly, (*Guru Shishya Parampara - Tabla Houston*, 2026) suggests merging the two systems as a complementary approach rather than an assimilative one, ensuring that both knowledge systems are appreciated equally. To close this gap, researchers highlight the importance of merging the two knowledge systems to form a unified knowledge system that enhances learners' cultural, historical, and identity significance (Blose, 2023). Moreover, balancing traditional knowledge with modern knowledge can help bridge the gap between local cultural context and global educational standards, thus enriching the learning experience for local learners (McDowell et al., 2025).

4.4. Qualitative Themes: Institutional and Structural Barriers

The interview findings explain the root causes of these textbook deficiencies, highlighting severe structural, institutional, and capacity-related barriers. Corroborating recent findings on indigenous curriculum integration, the primary obstacles stem from an acute lack of resources, reference repositories, and professional training.

The respondents revealed that they were trapped in a conceptual vacuum; many were unaware of what legally or theoretically constitutes indigenous knowledge, how to structurally arrange it within pedagogical units to adopt. This issue is compounded by a total lack of well documented resources. Although the initial orientations were provided,

designers received no technical or capacity-building training regarding how to construct IK-related competencies or learning activities. Typically, the IK associated learning competencies in both subjects and grades are quite minimal. This opposes (Ethiopian Federal Ministry of Education, 2020), which indicates that textbooks in Ethiopia aim to meet basic learning competencies; consequently, their content structure should correspond with the syllabus.

Finally, the curriculum development teams oriented to execute the integration of HIK within a highly compressed, project-based timeline of approximately 45 days. This rigid time constraint led to a rushed, unverified output. It eliminated any opportunities for field-testing materials, creating suitable learning experiences, or engaging in the organized community involvement and stakeholder validation necessary to accurately contextualize Hadiya oral traditions.

5. Conclusions

The synthesis of textbook evaluations and curriculum designer interviews reveals a complex, uneven, and fractured curricular landscape. While national frameworks mandate cultural inclusion, the practical execution remains deeply compromised.

The findings demonstrate that indigenous perspectives are not afforded epistemic equity within the current primary curriculum. Instead, HIK is predominantly incorporated in an insincere manner frequently treated as a passive historical relic, cultural decoration, or symbolism rather than an active, foundational component of the scientific knowledge base. Furthermore, the curriculum maintains an implicit hierarchy by segregating indigenous elements into separate, parallel text sections. This spatial isolation isolates native insights from mainstream, Western-centric scientific units, framing Eurocentric epistemologies as the dominant educational standard while positioning local worldviews as supplementary or optional. This structural division is reinforced by pejorative language and reductive labeling, which categorizes sophisticated native technologies under terms like *"backward industry"* or limits its scope to mere unverified "belief." By denying local knowledge an empirical baseline and failing to validate its practical utility, the curriculum implicitly signals to young learners

that indigenous knowledge systems possess less academic legitimacy than Western science.

The analysis also highlights significant structural fractures between policy documents, syllabi, and actual textbooks. In environmental science, the moderate alignment observed is undermined by a consistent reduction of HIK content in textbooks compared to the guidelines established in the syllabus. In Performing and Visual Arts (PVA), the alignment is entirely fragmented; the curriculum drops IK learning competencies to zero in Grades 5 and 6, forcing textbooks to carry scattered, unguided practical references. This practice misses key opportunities to tailor learning to the student's immediate environment, alienating young learners from their own lived experiences.

These curricular deficiencies are the direct result of deep institutional and systemic barriers. The successful integration of HIK is heavily obstructed by a profound capacity vacuum among design teams, who lack practical frameworks, codified reference repositories, and targeted technical training. This conceptual ambiguity is severely exacerbated by highly compressed, 45-day design timelines. This in turn, eliminates any possibility of comprehensive field-testing, stakeholder validation, or genuine community involvement.

6. Recommendations

The findings of the study demonstrate that indigenous perspectives are not afforded epistemic equity within the current primary curriculum. The current finding shows that there is an attempt to incorporate HIK into the primary curricular materials. However, the results reveal a complex, uneven, and fractured curricular landscape. Thus, to achieve meaningful curriculum transformation, educational stakeholders should shift from shallow inclusion to deep epistemic infusion that positions both knowledge systems as complementary knowledge base. This structural shift must be achieved through targeted capacity building programs that move beyond brief orientation to provide textbook authors and curriculum developers with intensive training on operationalizing advanced frameworks like Two-Eye-Seeing, Culturally Responsive Pedagogy, and place –based education into concrete learning competencies and pedagogical

scaffolding. Moreover, institutionalizing structured community partnerships via formalized co-authorship model and validation channels with Hadiyya elders and cultural custodians is essential to ensure authenticity, maintain cultural well-being, and accurately codify cultural traditions. Finally, the regional education bureau must allocate reasonable timelines by extending the project cycles to accommodate thorough field testing, validating the rigorous structural alignment outlined in the syllabus and their respective textbooks, and investing in the documentation of localized indigenous knowledge based resources repositories to serve as authoritative digital and print references for sustainable future curriculum design.

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Data Availability

The data supporting the findings of this study are included in the manuscript. Additional data may be made available by the corresponding author upon reasonable request.

Ethical Clearance

This study received ethics approval from the institutional research ethics committee of the College of Education, Hawassa University, Ethiopia, during its meeting on October 24, 2025 (Reference No. COE-REC/023/2025).

Ethics Approval

This study was approved by the institutional research ethics committee (IRET) of the College of Education, Hawassa University, Ethiopia (Ref. No. COE-REC/023/2025; Date of Approval: October 24, 2025). This research was conducted in accordance with

the university's ethical guidelines and standards for research involving human participants.

Declarations

Consent to Participate

Informed consent to participate in the study was obtained from all participants prior to conducting the interviews

Consent to publish

Not applicable. The manuscript does not contain any identifiable personal data, images, or other materials requiring consent for publication.

Competing interests

The authors declare that there are no competing interests financial, personal, or professional relationships that could improperly influence, bias, or compromise the study findings.

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