

Indigenous Epistemologies: The Practice and Challenges of Inclusion of IK in the Classroom Lessons of Primary and Middle School Teachers of Amhara Region, Ethiopia

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Submitted: 2023, June 07; Accepted: 2023, June 26; Published: 2023, July 11

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Citation: Yeseraw, A., Melesse, T., Kelkay, A. D. (2023). Indigenous Epistemologies: The Practice and Challenges of Inclusion of IK in the Classroom Lessons of Primary and Middle School Teachers of Amhara Region, Ethiopia. *Politi Sci Int.* 1(1), 19-32.

Abstract

This study investigated the practices and challenges of indigenous knowledge (IK) in the classroom teaching. The sample size was obtained using available sampling methods. The results of the data collected through the questionnaire and interviews showed the presence attempts of teachers to consider and relate classroom lessons to IK systems. However, lack of awareness about the knowledge of IK possessors, socially demoralizing IK possessors, the culture of undermining the ancients' noble works, little attention given for IK inclusion in the textbook and inaccessibility of well-documented indigenous values posed challenges in doing so. There were no statistically significant mean differences between male and female respondents when considering local area indigenous values and facing challenges. Whereas, there were statistically significant differences between teachers teaching in towns and rural areas in terms of incorporating indigenous pedagogies during lesson planning and in terms of incorporating IK

in the classroom teaching. The post hoc analysis of variances also revealed that these changes seemed to indicate that the value of sensing knowledge diversity in the classroom may increase as service year increases in teaching.

Keywords: Challenges; Classroom lessons; Inclusion of indigenous knowledge; Primary school; Teachers' practices

1. Introduction

Indigenous knowledge (IK) is strongly entrenched cultural experiences that organized and regulated the lives and relationships among the community and non-humans in a particular environment. Although the proportion of communities that own it varies, any community has elements of IK [1]. Indigenous people owned their traditions, cultures, languages, and histories [2]. On the contrary, Western curriculum theory emphasizes subject-based division of knowledge areas and learners are exposed to the dogma of fragmentation, which jeopardizes inward-looking progress. There is no concern for the building of relationships among topics in various subjects [3-6]. In this respect, some subject matters are compulsory or elective and are given a different degree of importance, with great value given to the sciences. Therefore, the very nature of the structure and the delivery system of Western education are clearly different from those of the indigenous philosophy of

education. As a result, this educational paradigm disempowers IK and people [7]. The school system in Africa in general and Ethiopia in particular is currently oriented toward Euro-centric and Western education philosophy rather than acknowledging Africanized and Afro-centric indigenous education philosophy that empowers Africans [8]. The Western tradition considered any other means of cognition as savage, irrational, and primordial [9]. The existence of incompetent work forces in the country is the result of this application of knowledge systems far from local real-life situations and the predominance of colonial education systems, which tend to change the country's sociocultural aspects into those of Europe [10].

To settle these problems, incorporating IK into the western-oriented curriculum and classroom structure is promising [6]. In the classroom, thinking beyond the subject matter boundary is required. They are also needed for realizing authentic

decolonized indigenous education and its practices by relating the given lessons with reality [11]. As IK is a valuable science that deserves recognition in the school science curriculum, the school teacher can connect the school science with the students' cultural background [12-14]. For successful learning to take place, properly culturally mirrored pedagogical approaches and models are needed [15-17].

When students see their cultural elements incorporated into formal science education, they are more likely to become active participants, become creative, develop their ownership and self-esteem, develop their potential talents and abilities, and eventually become acquainted with cultural pluralism and democratic coexistence. This way of learning also helps students gain more confidence in context-based learning carried out based on their pace of learning, taking responsibility, and feeling a sense of ownership [18]. As the relevance of the IK system in the lives of the local people gained momentum [19]. Accredited the importance of the integration of indigenous and modern science to ensure sustainable development, community empowerment, and poverty reduction. Many countries now recognize the importance of incorporating IK systems into science education [20, 21].

This laid the groundwork for science education to promote lifelong learning empowers the academic field of study and employs social justice practices to benefit the nation's marginalized groups [1, 20, 22-24]. For this purpose, scholars suggested the necessity of merging IK with Western science and producing sets of hybrid knowledge systems [25-30]. They agreed that the practice of Western science and technology alone could not bring about changes in the lives of the people in developing nations. To achieve this purpose added that depth of understanding and lots of time is needed to understand the reality of local experiences, practices, and values in the communities [31]. This requires dedicated scholars to construct knowledge from knowledge streams. Scholars who recognize diversity in the classroom understand and respect learners' beliefs, local conditions, and the way each student learns effectively.

Despite these credits given to integrate IK systems into the curriculum, research has indicated that most curriculum developers and teachers have little understanding of indigenous traditions, knowledge systems, values, and culturally appropriate pedagogies because of their high orientation toward alien cultures. As a result, they viewed the incorporation of IK into the curriculum negatively. The nature of teachers' perceptions determines the level of their actions to integrate IK elements in the classroom contents. According to a study on the practice of this issue in Canada, teachers were hesitant to include indigenous content in their classroom teaching and used methods for curriculum indigenization haphazardly [32]. Another study in Zimbabwe also indicated that teachers did not give a place for indigenous sciences in their classroom teaching of the formal curriculum as they perceived school science and IK as having a dual context of modernity and tradition.

Teacher experience is another major factor in determining

the quality of teaching using an indigenous approach because teaching experience improves skills and methodologies [33]. What Male and female teachers have differences in their exposure, interaction, and experience with IK systems, which make for differences in the selection of instructional materials for the subject matters they teach [34]. Furthermore, some cultures forbade females from participating in certain cultural practices, so gender plays a role in limiting a teacher's awareness of indigenous cultural values [35]. On the other hand, teaching in urban areas causes teachers to have limited access to IK resources. Discovered that the location of a school influences teachers' positions to place different priorities on content goals associated with value orientations [36]. However, teaching classroom lessons through critics helps teachers foster meaningful learning [37]. Therefore, experience, gender, and school location can be combined as indicators of the level of teachers' responsiveness to IK systems.

Some research findings revealed the potential capacities that indigenous Ethiopian knowledge systems can have parts in developing competencies of the young generation if they are intertwined and play a role in the country's curriculum development and practices. For instance, in his study tried to identify the potential values of the Arsi Oromos' proverbs in socializing the children and in crafting effective human forces. Pointed out some Ethiopian indigenous educational values, like its music, arts, science, architecture, and philosophy that served as foundations for other knowledge systems. However, these Ethiopian people are going back from the line of civilization to ethnic conflict in the 21st century [38]. Startlingly, the work of identified that some foreign knowledge seekers took out Ethiopian IK elements in agriculture, shared forestry, medicine, handicrafts, the Ethiopian indigenous language Ge'eez, the indigenous democratic system with justice, and other important elements of the knowledge system and used them as their inventions and are currently practicing them in their development efforts [38]. As a remedy for this risk of extinction, the country needed to have IK integrated with the best Western experiences in the formal curriculum [38]. His work also informed the need to value the validity and legitimacy of local knowledge systems in the development of Ethiopian curricula so that it could compete with Western knowledge's supremacy. In line with this, UNICEF (2004) stated that every child has the right to a system of education that values the child's culture, language, and community at large. To do so, as Aikenhead argued, teachers are required to have good perception and make greater efforts to think ahead of the formal curriculum and fuse the contents of knowledge systems in the context of diverse cultural aspects [39]. Teachers can find content and ideas based on multiple cultural perspectives by considering the contexts. Teachers' exposure to the view of cultural pluralism and the development of autonomous acculturation is important. Much is needed from classroom teachers to incorporate local cultural content elements and pedagogy into the classroom curriculum. They are required to develop trust in the issue of the context and interface between IK systems and Western science to elicit higher thinking for addressing meaningful learning [40].

So far, cases like efforts made to integrate classroom lessons with students' prior experiences and local knowledge systems, as well as challenges faced in doing so to provide comprehensive and authentic verification of the level of IK inclusion in classroom activities, are the main issues in this study. Therefore, as it is well discussed above, the issue of an IK based formal curriculum is critically important to provide classroom contents and approaches inclusive of both indigenous and Western knowledge systems. As a result, ample research works identifying gaps and potential solutions to problems should have been available in relation to the level of IK integration in the practice of the new primary school curriculum in Ethiopia. As it is new, this curriculum is being tried out in some selected primary schools to prove its practicability, and as a result, it will be implemented at the country level in all primary schools. Therefore, this present research study seems to bring a new turn in investigating the status of IK inclusion in practicing the new primary and middle school curriculum through a comprehensive study using alternative data sources and tools. Consequently, it is the researchers' opinion that this study is relevant and timely to show something new in the status of IK integration in the classroom activities, which the previous studies did not address this issue. Accordingly, the following leading questions are depicted in order to survey facts concerning the issues of this current study. To what extent do teachers incorporate indigenous values into the classroom? Are there differences in teachers' practices based on gender, experience, and location in integrating IK values in the curriculum? (2) What are the major challenges the teacher faces in integrating IK systems with the existing curriculum?

2. Method

2.1 Approach and Design

For this study, a mixed-methods approach with concurrent design was used. A mixed methods approach can help to gain a stronger understanding, more insight, and complete information about the problem of the study [41]. Besides, this approach minimizes limitations that emerged from each of the two approaches during the collection of the data [42]. Above all, a convergent mixed-methods design was chosen to accomplish the goal because it places equal emphasis on both types of data in the research study. Based on these designs, the researchers collected both qualitative and quantitative data, analyzed them separately, and then compared the results to see if the findings confirm or disconfirm others. Because the collection of both quantitative and qualitative data and the triangulation of these data neutralize the weaknesses of each type of data [43]. Obtaining data about the phenomenon from various groups of data sources using multiple data collection instruments is required for the credibility of the collected data [44]. To ensure the reliability of the data collected, information on the phenomenon must be gathered using a variety of data collection instruments [44]. In this study, the data were gathered from classroom teachers with different teaching experiences as well as places where they were teaching using closed-ended questions and interview questions.

2.2 Sampling Procedures

From the purposely selected six administrative zones by the Amhara Regional Education Bureau (AREB) to try out the new

curricula, four administrative zones (West Gojjam, South Gondar, East Gojjam, and Bahir Dar City Administration) were purposely selected. In these administrative zones, nine districts (Debre Markos, Enemay, Gozamin, Bure zuria, Finoteselam, Dera, Woreta, Bahir Dar zuria, Estie and Bahir Dar City) were selected using systematic random sampling and purposive sampling techniques, respectively. Since one primary and middle school in each district and two primary and middle schools in the special zone were selected by Amhara Regional Education Bureau (AREB) for the pilot, the researchers took samples from all of these schools using comprehensive sampling. Accordingly, in these schools, a total of 372 teachers of the subject matter on trial were selected using available sampling. Among these, 43.82% were male and 56.18% were female participants. Teachers with varying levels of experience took part in the study to collect comprehensive data. In terms of educational status, all participants included in the sample were either diploma or degree holders. All sample teachers filled out the questionnaire, and from these, twenty-eight purposefully selected teachers from each school and each subject were involved in the interviews.

2.3 Data gathering tools

The major data gathering instruments of this study were questionnaires and interviews.

Questionnaire: - To measure teachers' practice and challenges on the inclusion of IK in the curriculum, some items of the questionnaire were adapted from a five-year science education development project in Nunavut in line with the inclusion of IK systems in the curriculum, Canada (2010) and some others were depicted from the reviewed literature of this study. To get responses from these respondents, a four-point Likert-type scale (always, sometimes, rarely, and not at all for measuring frequency (e.g., practice-related options) and strongly disagree, disagree, agree, strongly agree for measuring challenges were used as response mechanisms.

Interviews: - In this study, direct participant experiences with the phenomena were gathered using an interview guide. It enabled the researcher to directly follow up with respondents to get potential responses for future research on the subject until the researcher was satisfied. The information from teachers was gathered using a semi-structured interview guide among other methods. Researchers can examine in-depth information on participant experiences and sentiments on the topic under study by using this interview guide [45]. With the aid of this tool, the researcher was able to gather more information from teachers about the practice of teachers in and respective challenges faced in the incorporation of IK elements in the classroom teaching.

2.4. Data Analysis

This section examined the accuracy and dependability of the instruments and the qualitative and quantitative data obtained from teachers' responses. The investigation used statistical analyses for the quantitative data, including reliability analysis for instruments and descriptive statistics and inferential (independent sample t-test and one-way ANOVA) for the teachers' responses. By assembling similar concepts into a small number of overarching themes, the

qualitative data obtained from interviews was examined. These responses, obtained from the questionnaire and interview guide, were analyzed based on how teachers practiced in the inclusion of IK in the classroom curriculum and the challenges faced in doing so. In order to verify it, the quantitative data obtained from the questionnaire was triangulated, evaluated, and presented alongside the data gathered from interview guides.

2.5. Reliability and Validity of Instruments

Reliability of Instruments: - In order to value the reliability of the questionnaire as a data collection instrument, Cronbach alpha reliability estimation methods were used to determine its reliability in collecting the data for the research questions. The reliability of the questionnaire was determined using the reliability estimation method that was chosen. In this study, the Cronbach alpha internal consistency reliability table for fifteen items on the "planning" scale was calculated as $\alpha = .907$. The item correlation matrix has also shown that all items are positively correlated, ranging from 0.71 to 0.841. Internal consistency reliability for fifteen items with the scale label "classroom practice" was calculated and checked at $\alpha =$

0.839. The item correlation matrix revealed that almost all items were positively correlated, with correlation coefficients ranging from 0.057 to .553. $\alpha = .791$ for the internal consistency and reliability of thirteen items on the "challenge" scale. The inter-item correlation matrix has shown that most items are positively correlated in the range of .028 to .660. Accordingly, items were accepted and positively correlated to measure the practice of teacher's challenges faced in the integration of indigenous values in the classroom teaching and answer the research questions since the alpha value was greater than the suggested values of .70 and .65, respectively. Therefore, the results obtained from the respondents concerning the issues of this study were reliable.

The reliability of instruments in the main study was almost identical to the reliability of instruments in the pilot study. The alpha values of both tests were above the determined value. The alpha values of instruments used during the pilot study were reported in the following table to ease comparisons with the tests of instruments after collecting the data during the main study.

Scale labels	Alpha coefficients	Number of items	Ranges of inter item correlation
Planning	.907	15	.071 to .841
Classroom practice	.839	15	0.057 to .553.
Challenge	.791	13	.028 to .660

Table 1: Scale-wise Reliability Test of teacher questionnaire after collecting the data

Scale labels	Alpha coefficients	Number of items	Ranges of inter-item correlations	Valid cases
Planning	.938	15	.000 to .947	15
Classroom practice	.893	15	.000 to .880	15
Challenges	.737	13	.010 to .904	15

Table 2: The alpha values of instruments during the pilot study

2.5.2. Validity of instruments

The content validity method was applied in estimating the validity of the instruments and checking whether they included the contents to measure the inclusion of IK in the curriculum. In order to validate and check the validity of all instruments used in this research study, the instruments were distributed to volunteers and interested professionals in the fields of research and education. This was relevant to check whether the instruments were really in line with the purpose of this study. Their suggestions were incorporated, and some revisions were made to the contents of the instruments based on the comments given by these professionals. Some rearrangements were made, and some new items were added to the contents of the questionnaire to increase the number of items.

2.6. Procedures

Teachers' practice and challenges they face in incorporating IK in the formal curriculum were checked through open-ended and close-ended data collection tools to collect the data from the participants. The researcher translated quantitative data collection instruments into Amharic and had them cross-checked by colleagues from the English department. This translation was made necessary to make it easier and less burdensome for respondents to respond without confusion. The vice directors

of each school provided the data on the number of primary school teachers needed for statistical analysis. All of the chosen elementary school instructors gave their consent to continue taking part in the study for a while. By delivering authorization documents from each district's (Woreda) education office to each selected school, the researcher conducted the questionnaire and interview activities. Teachers received 372 questionnaires in total, and each one was filled out and returned. Besides, interviews in Amharic were performed and recorded, with the results being copied into the word document. Although the interview transcripts remained in Amharic, the coding and analysis of the results were translated into the English version. These semi-structured interview guides created with teachers were used to collect data. Depending on the participants' modes of expression when responding to interview questions, varying amounts of time were required. Some participants forwarded responses precisely, while others did the opposite. The interview with one participant took between 30 and 45 minutes on average. Confidentiality of the responses and the direct quotes were kept secret and not linked to the individual participants' credentials. The inquiry employed statistical studies like reliability analysis, descriptive statistics, and inferential statistical tests such as the independent t-test. The percentages, means, and standard deviations of the data were calculated. The inferential statistical

tests such as the independent t-test were applied to determine whether there was a significant difference between the mean scores of the data obtained from three independent groups of respondents (teachers in this study were grouped into different groups based on gender issues, experience, location, and educational status). In order to verify, the quantitative data obtained from the questionnaire was triangulated, evaluated, and presented alongside the data gathered from the interview guides.

3. Results

3.1. Measuring the status of teachers' classroom practice

Regarding the status of teachers' practices in integrating IK systems into classroom teaching, how they integrate lessons in the formal curriculum with the local knowledge systems and differences in teachers' practices based on gender, experience, and location in integrating IK values in the curriculum, the following analysis was made.

Variables	1	2	3	4	Mean	SD
Considering local experiences of the learners.	14(3.8%)	12(3.2%)	170(45.7%)	176(47.3%)	3.37	.724
Planning for sharing experiences from local knowledge holders	-	33(8.9%)	203(54.6%)	136(36.6%)	3.28	.615
considering learners' sharing each other's experiences	-	21(5.6%)	211(56.7%)	140(37.6%)	3.32	.576
Thinking practicality of lessons benefiting the community		32(8.6%)	183(49.2%)	157(42.2%)	3.34	.629
Appropriate designation of indigenous contents.	4(1.1%)	30(8.1%)	264(71%)	74(19.9%)	3.10	.560
Respecting knowledge diversity in the classroom	3(.8%)	37(9.9%)	146(39.2%)	186(50%)	3.38	.697
Addressing relationships among the world views.	3(.8%)	43(11.6%)	124(33.3%)	202(54.3%)	3.41	.723
Creating the learning environment that promotes IK	10(2.7%)	33(8.9%)	132(35.5%)	197(53%)	3.39	.760
Curtailing bias on the inclusion of IK	25(6.7%)	40(10.8%)	159(42.7%)	148(39.8%)	3.16	.867
Incorporating IK responsive pedagogy	4 (1.1%)	108 (29%)	134(36%)	126(33.9%)	3.03	.820
Encouraging social construction of knowledge.	3(.8%)	65(17.5%)	146(39.2%)	158(42.5%)	3.23	.761
Incorporating collaborative work approach	9(2.4%)	42(11.3%)	153(41.1%)	168(45.2%)	3.29	.761
Invites elders in classroom curriculum and instruction.	24(6.5%)	83(22.3%)	158(42.5%)	107(28.8%)	2.94	.876
Applying methods integrating creativity and art	-	104(28%)	155(41.7%)	113(30.4%)	3.02	.764
Incorporating IK responsive teaching aids	7(1.9%)	33(8.9%)	170(45.7%)	162(43.5%)	3.31	.711
Total	7.6(2%)	47.7(13%)	167(43%)	150(40.3%)	3.23	0.671

Table-3: A. Planning the lesson

The total percentage mean values of the teacher participants were 12.84%, 42.54%, and 40.3%, which indicated the minimal and maximal presences of incorporating IK systems during lesson planning, respectively. Unlikely, 1.9% of participants did not plan the lesson using locally available knowledge elements. The majority of respondents (42.54%) occasionally consider incorporating IK when planning lessons, while others (40.3%) always include local experiences in lesson planning, 12.84% barely incorporate local values, and the remaining 1.9% completely ignore incorporating these knowledge systems. The maximum (SD =.876) and minimum (SD =.560) for participants were between sharing experiences from local knowledge holders and inviting these elders, who hold significant roles in classroom curriculum and instruction.

From these, it was deduced that the majority of teachers were attempting to consider IK elements when planning the lesson. But the frequency varies among teachers due to unknown reasons. Some teachers frequently incorporated indigenous values, some others considered the context sometimes, and a few others did not give due attention to local knowledge elements during planning the lesson. Additional statistical analysis, such as an independent samples t-test, was also made to identify if there were significant mean differences between the groups. Consequently, there were no statistically significant mean differences between male and female respondents when considering local area indigenous values ($P > 0.05$). However, there were a few statistically significant differences in the mean values between teachers teaching in towns and rural areas ($P = 0.004$) in terms of incorporating indigenous pedagogies during lesson planning, as shown in the table below.

Item		Demog. variables	N	M	SD	df	t-value	p-value
Incorporating IK responsive pedagogy	Sex	Male	163	3.05	.852	370	.460	.646
		Female	209	3.01	.797			
	Location	Urban teachers	210	3.13	.783	370	-.28772	.004
		Rural teachers	162	2.89	.849			

Table-4

Variables	Strongly Disagree (1)	Disagree (2)	Slightly Agree (3)	Agree (4)	Mean	SD
Give chances for learners in sharing experiences	-	20(5.4%)	134(36%)	218(58.6%)	3.53	.598
Celebrate diversity of the knowledge systems	6(1.6%)	37(9.9%)	164(44.1%)	165(44.4%)	3.31	.715
IK based sensitive teaching	2(.5%)	15(4%)	149(40.1%)	206(55.4)	3.50	.603
Familiar with holistic approach of teaching	2(.5%)	19(5.1%)	131(35.2%)	220(59.1%)	3.53	.620
Engage learners in creating a new knowledge	1(.3%)	48(12.9)	122(32.8%)	201(54%)	3.41	.719
Provide models of the local knowledge systems	-	28(7.5%)	193(51.9%)	151(40.6)	3.33	.611
Provide lessons showing relationships among the knowledge systems	-	54(14.5%)	209(56.2%)	109(29.3%)	3.15	.646
Create co-learning classroom environment	3(.8)	21(5.6%)	175(47%)	173(47%)	3.39	.633
Promote participation for the transformation of the current realities	5(1.3%)	11(3%)	146(39.2%)	210(57%)	3.51	.625
Give life for students' practices	6(1.6%)	23(6.2%)	120(32.3%)	223(60%)	3.51	.687
Teach science from the perspective of indigenous values	3(.8%)	13(3.5%)	49(13.2%)	307(83%)	3.77	.542
Facilitate conditions for the learners to learn from elders' experiences	3(.8%)	17(4.6%)	108(29%)	244(66%)	3.59	.618
Promote the learners integrating lessons with the local knowledge areas	-	31(8.3%)	187(50.3%)	154(41.4)	3.33	.624
Structure activities contextualize classroom lessons	3(.8%)	16 (4.3%)	126(33.9%)	227(61%)	3.55	.619
Give project works invite the learners to have contacts with elders' experiences	-	44(11.8%)	187(50.3%)	141(37.9%)	3.26	.656
Total	2.3(0.6)	26.5(7%)	146.6(39%)	196.6(53%)	3.44	0.63

Table-5 : B. Teachers' classroom practices

According to the total mean percentage of responses (53%) in this table, respondents frequently consider indigenous values in classroom teaching. The remaining others, like 39.43%, were sometimes applying inclusion of IK, 7.10% were rarely practicing, and a few respondents (0.6%) did not practice inclusion of IK in their classroom teaching. The maximum (SD =.719) and the minimum (SD =.542) for participants were between celebrating the diversity of the knowledge system and teaching science from the perspective of indigenous realities.

In addition to these quantitative findings about teachers' classroom practices, teachers were interviewed on how they are practicing the subject matter they teach in the classroom? How familiar are they with the concept of cultural pluralism

and attempting to establish relationships with local knowledge systems? Are they considering the learners' prior experiences when they provide classroom lessons? Do they have any contacts with local experts? What kinds of approaches are they using to integrate elements of the local knowledge systems with the classroom curriculum and celebrate the diversity of the knowledge systems?

The interview responses of different teachers revealed the existence of some attempts to incorporate IK into classroom lessons. Their direct responses were stated as follows: Teachers may have different practices for the inclusion of IK as per the type of subject matter they teach, their commitment, their awareness of the local knowledge system, and other issues.

Interviews are conducted with teachers to determine which method is used to connect indigenous values to classroom lessons. Their reflections are listed as such below. The general science teacher at Bruh Tesfa Primary School attempted to integrate some cultural elements in the classroom by teaching theoretically and initiating the learners. For example, she replied that learners were promoted for learning the traditional way of curing diseases. A student reflected on how cough is traditionally treated. In this case, one student said, "*Tenadam*," another student, "*Nech shinkurt*." In addition, concerning other ways of curing a disease, another student said, "My grandfather gives treatment for curing marasmus traditionally." In such a way, the teacher has tried to invite the learners to reflect on their prior experiences in the classroom.

Another general science teacher from Dudmegn primary school in Woreta woreda replied that, as much as possible, he tried to integrate the classroom lessons with local cultural elements. He attempted to initiate the learners' telling what lessons they had inherited from their families and other people in their surroundings. He tried to provide teaching aids made from local materials. General Science at Hibret Amba in Enemay Wareda attempted to practice inclusion of IK in the classroom by inviting learners to tell their prior experiences concerning a lesson and celebrating the different experiences of the learners. For example, concerning cosmetic materials, learners forwarded local cosmetics like "*Emsosla*," "*Yetit fre*," and others to beautify the bride. In addition, the general science (chemistry) teacher took students on a field trip to IK holders to practice incorporating local values. For example, on some days, the teacher took the learners to the house of a local alcohol producer to show them the local system of isolating mixtures. He also tried to incorporate indigenous elements through project work and by asking learners about their prior experiences with certain lessons. At Finote Selam primary school, the same subject matter teacher was also practicing by relating lessons to local experiences and assigning project work in which local knowledge possessors shared their experiences. Another general science class at the same school tried to practice relating classroom lessons with local experiences. For example, she used "*Tenaadam*" to treat coughs, decanted boiled coffee to teach decantation, and local beer production to teach distillation. The geography teacher at Dudmegn primary school, Woreta, reflected that "even though the textbook is hardly ever integrated with IK elements, my secondary education experiences helped me to integrate these experiences with some contents of classroom lessons." Another geography teacher at Hibret Amba primary school reported that he attempted to connect the students' classroom learning to their family's IK values. For example, on the lesson "the battle of Adwa," the teacher assigned a project for the learners, who were asked to collect information about what their families and other old people understood concerning this battle and its essence and historic impacts for the survival of their nation as an independent and united one, and what made the ancients love the mother land. The teacher also attempted to open debatable issues concerning

historical content for the students and invite guests into the classroom to present on these issues. He also organized field trips to historical sites in the surrounding area to demonstrate practical issues related to lessons about these heritages, such as the historical and religious site known as "Arbaitu Ensisa church," and demonstrated the historical, economic, cultural, spiritual, and architectural values of this heritage.

Concerning plants, the teacher has also shown the learners the medicinal importance of some plants like "*Haregressa*," "*Ret*," and the clinical importance of "*Endod*," etc. To do all these things, he has an awareness of these and other local knowledge centers. Other than these, he has also gained knowledge of other civilizational elements like weaving, metalwork, and woodwork. In order to inculcate the value of these IK elements, he attempted to celebrate the diversity of knowledge by making the learners share experiences individually and in groups in the classroom, which increased learners' initiatives to understand their cultural value and other IK elements. The same subject matter teacher (Debre Markos) practiced by incorporating IK elements during planning, in preparing teaching aids, in teaching methodologies, in initiating learners to bring some realities and show for their classmates, in giving project works, inviting guests to share their experiences in the classroom, and in initiating learners to present their local prior experiences on the lesson. Environmental Science teacher (Dudmegn Primary School) reflected that there is an attempt to integrate some local experiences, for instance, preparing paints and an instrument of distillation from local materials to use them as teaching aids in the classroom.

Generally, like the findings from the questionnaire responses, the interview findings also uncovered the same attempts by classroom teachers to integrate some cultural elements and initiated the learners to tell what lessons they have inherited. Teachers attempted to provide teaching aids made from local materials, inviting students to share their prior experiences with a lesson, and celebrating the students' diverse experiences. Teachers attempted to integrate IK holders through field trips, project work, relating learners' classroom learning to their family's indigenous values, preparing open debatable issues for learners concerning historical contents, inviting guests into the classroom, celebrating diversity of knowledge, and sharing experiences individually and in groups. Planning, preparing teaching aids, and teaching methodologies bring some realities, providing prior experiences of learners, and preparing paints and a distillation instrument from local materials, relating the concept of stories with local heritages and architectures. Showing indigenous letters and numbers and making different colors from locally grown plants. preparing teaching aids in the form of photographs depicting the culture of local dress and eating in traditional styles, as well as appreciating and sharing each other's local experiences. In general, this analysis revealed that most teachers attempted to consider and relate classroom lessons to some IK systems in their classroom instruction.

Item	location	N	M	SD	df	t-value	p-value
Provision of models local knowledge system	Urban	210	3.42	.575	370	-3.219	.001
	Rural	162	3.22	.638			
Encouraging teaching indigenous values perspective	Urban	210	3.86	.678	370	-3.408	.002
	Rural	162	3.67	.390			
Facilitating conditions for learning from the elders	Urban	210	3.69	.531	370	3.476	.001
	Rural	162	3.47	3.69			

Table-6

As a result of the t-test analysis, variables in this table revealed significant statistical differences in the mean value of incorporating IK in the classroom between teacher respondents teaching in urban and rural settings (P =.001, P =.002, and P =.001), as orderly listed in the table in accordance with each variable. These might be due to the accessibility of IK areas. Teachers in rural areas could have more opportunities to have access since most probably IK elements are found in these areas. Teachers' experiences 0–5 compared with teachers' experiences

10.1–15 and >20 in terms of owning IK-based sensitive teaching (P = 0.012, P = 0.007); teachers' experiences 0–5 compared with >20 in terms of being familiar with encouraging indigenous sense making (P =.018); teachers' experiences 0–5 compared with 5.1–10, 10.1–15, and 15.1–20 were computed as shown in the post hoc analysis table below. As a result, the respondents' slight differences in integrating IK into the curriculum may be due to their level of teaching experience.

Variables	Teachers experiences	N	Mean	Std.d	Std. error	Sum of squares	df	Mean squares	F	Sig
Owning IK based sensitive teaching	0-5	17	17	.243	.059	5.134	4	1.284	3.627	.006
	5.1-10	29	29	.688	.128					
	10.1-15	105	105	.570	.056					
	15.1-20	130	130	.556	.049					
	>20	91	91	.683	.072					
	Total Between groups	372	372	.603	.031					
Familiarity in encouraging indigenous sense making	0-5	17	3.94	.243	.059	3.933	4	.983	2.601	.036
	5.1-10	29	3.62	.494	.092					
	10.1-15	105	3.50	.590	.058					
	15.1-20	130	3.54	.612	.054					
	>20	91	3.44	.718	.075					
	Total Between groups	372	3.53	.620	.032					
Creating co-learning classroom environment	0-5	17	3.88	.332	.081	5.090	4	1.273	3.252	.012
	5.1-10	29	3.34	.670	.124					
	10.1-15	105	3.34	.602	.059					
	15.1-20	130	3.43	.622	.055					
	>20	91	3.32	.681	.071					
	Total Between groups	372	3.39	.633	.033					

Table-7 : ANOVA results based on teaching experiences

Variables	(I) Teachers experience	(J) Teachers experience	Mean Difference (I-J)	Std. Error	Sig.
Owning IK based sensitive teaching	0-5	10.1-15years	.503	.156	.012
		>20 years	.535	.157	.007
Familiarity in encouraging indigenous sense making	0-5 years	>20 years	.502	.162	.018
Creating co-learning classroom environment	0-5 years	5.1-10 years	.538	.191	.041
		10.1-15 years	.539	.164	.009
		15.1-20 years	.452	.161	.043
		>20 years	.564	.165	.006

Table-8 : Post-hoc analysis

3.2. Measuring the status of challenges

Research question # 4: **What are the major challenges the teacher faces in integrating IK systems with the existing curriculum?**

The following analysis was made based on the responses to this research question about the challenges teachers faced in integrating IK systems into the curriculum.

Variables	1	2	3	4	5	Mean	SD
little orientation in the value of IK	63(16.9%)	195(52%)	47(12.6%)	52(14%)	15(4%)	2.36	1.045
Absence of IK documentation	124(33.3%)	107(29%)	54(14.5%)	73(19.6%)	14(3.8%)	2.32	1.227
Having no skills to teach science from the perspective of indigenous culture	69(18.5%)	100(27)	59(15.9%)	99(26.6%)	45(12%)	2.87	1.322
no necessary resources and materials in the school	79(21.2%)	56(15%)	52(14%)	61(16.4%)	151(41%)	3.01	1.333
attention is given for IK in the text book	90(24.2%)	89(24%)	70(18.8%)	86(23.1%)	37(10%)	2.71	1.325
Lack of support from the school community	124(33.3%)	103(28%)	33(8.9%)	86(23.1%)	26(7%)	2.43	1.341
Having no believes that IK systems are competent with the Wks.	88(23.7%)	155(42%)	13(3.5%)	64(17.2%)	52(14%)	2.56	1.381
IKs have little values to incorporate it in the curriculum	116(31.2%)	114(31%)	12(3.2%)	65(15.7%)	65(16%)	2.59	1.506
strong orientation with the Wks	58(15.6%)	124(33.%)	67(18%)	82(22%)	41(11%)	2.80	1.257
IK possessors are not volunteer to tell the secretes of the value of IK	62(16.7%)	136(37%)	71(19.1%)	68(18.3%)	35(9.4%)	2.67	1.220
believe IK systems as the only best experiences	115(30.9%)	98(26%)	15(4%)	62(16.7%)	82(22%)	2.73	1.575
Activities and project works do not invite fusion of IK systems in the classroom teaching	28(7.5%)	51(14%)	95(25.5%)	149(40%)	49(13%)	3.38	1.108
Graphic organizers in the text books have no representation of IK value systems	25(6.7%)	47(13%)	104(28%)	138(37%)	58(16%)	3.42	1.102
Total	81(22%)	106(28.4)	53.2(14.3%)	83.5(22%)	52(14%)	2.75	1.28

Table-9

69.3% of the respondents agreed that awareness of the value of IK was not their problem; 62.1% of them disagreed with considering the absence of IK documentation as a problem; and 65.4% and 61.8% of the respondents, respectively, witnessed that the question of competency and the values of IK systems were not their challenges to incorporate indigenous values in their classroom teaching. Similarly, lack of support from the school community and involuntary activities of IK possessors to reveal the secrets of the value of IK were not considerable problems that prohibited making teachers integrate IK systems in their classroom teaching, as indicated by 51 percent of the respondents.

The presence of some scarcity of necessary resources and materials in the school; the presence of little attention given to IK in the text book, as indicated by 57% and 48.1% of participants, were some of the available challenges to consider IK during the classroom teaching. Similarly, the interview responses of teachers indicated the following findings in relation to these interview questions:

Interview No. 2 What are the challenges you might face in your efforts to integrate classroom lessons with local values? Are you familiar with the local knowledge systems? Are there mechanisms at the school level to create contact with knowledge-able others in the society where you are teaching? What problems do you experience when implementing this requirement?

Teachers can face different problems due to time scarcity, lack of accessibility to IK possessors and areas, lack of documentation of IK elements, and the like. Based on these ideas, teacher participants were interviewed to find out whether they were facing challenges in the work of including IK systems in their classroom teaching. Their reflections in these cases were stated as follows: A teacher of general science at Dudmagn primary school reflected that the text book seemed poorly prepared. It could not initiate the learners to integrate indigenous values even in classroom lessons, which can easily be related to local IK elements, let alone others. The presence of a problem of insight learning (lack of true understanding) on the profession of IK possessors was revealed by a teacher of the same subject

matter from Finote Selam Primary School, who stated, "We Ethiopians give nick names for traditional professionals, which demoralizes them." These made us far apart from these indigenous professionals, who did not share their indigenous experiences. A Geography teacher in Finote Selam primary school reflected that lack of IK documents which can be used as references is another problem in integrating the local values in the curriculum.

Generally, even though they tried their best, teachers of all sampled subject matters commonly agreed on the existence of the following challenges in the work of integrating IK systems with classroom lessons: Lack of awareness about the knowledge of IK possessors, socially demoralizing IK possessors, and the culture

of undermining the ancients' noble works These misconceptions made them avoid contact with local professionals. In addition, these new textbooks could not initiate the integration of classroom lessons with local values. Finally, the inaccessibility of well-documented indigenous values posed a new challenge in relating classroom lessons to IK elements.

To sum up, the findings from the interview, almost supported those quantitative findings obtained through the questionnaire. As the mean values in the table below were compared to see the existence of significant differences between the two groups (male and female), Levene's test for equality of variances showed the following results:

Variables	Gender	Mean	SD	MD	t-value	df	Sig (2 tailed)
Graphic organizers do not represent IK values	Male	3.23	1.092	.114	2.949	370	.003
	Female	3.57	1.090				
Absence of resources in teaching classroom lessons integrating IK	Male	3.18	1.310	1.39	-2.112	370	.035
	Female	2.89	1.340				

Table-10

When it came to the dependent variable "graphic organizers do not represent indigenous values," there were significant mean value differences between male and female respondents ($P=.003$). Similarly, there were also significant mean value differences between male and female participants ($P=.035$) in terms of the dependent variable "absence of resources in teaching classroom lessons integrating indigenous cultures." Otherwise, there were no other significant mean differences seen in other independent variables in terms of deciding whether these challenges faced teachers in incorporating IK in the classroom ($P > 0.05$). Some difficulties may exist as a result of differences in how male and female teachers create graphic organizers (pictures) that represent indigenous values, as well as the accessibility of IK integrated resources in their classroom lessons.

4. Discussion

This study used some modified and validated IK inclusion measuring instruments to investigate the practice and challenges they faced on the incorporation of IK into the primary school curriculum. The measures' internal consistency and content validity were assessed in order to ascertain whether they had the content necessary to gauge the variables. The findings of these studies demonstrated that the tools used to measure the scales of the variables were found to be valid and reliable.

4.1 Teachers practice in integrating IK in the classroom teaching

The Cronbach alpha internal consistency reliability table for fifteen items on the "planning" scale was calculated as $\alpha=.907$. The inter-item correlation matrix has also shown that all items were positively correlated, ranging from .071 to .841. Internal consistency reliability for fifteen items with the scale label "classroom practice" was calculated and checked at $\alpha=0.839$. The inter-item correlation matrix has shown that almost all items were positively correlated, ranging from 0.057 to 0.553.

From the findings of this current study, it was deduced that the majority of teachers were attempting to consider IK elements during lesson planning. But the frequency varies among teachers due to unknown reasons. Some teachers frequently incorporated indigenous values, some others considered the context sometimes, and a few others did not give due attention to local knowledge elements during planning the lesson.

An item "giving project work with an item promoting understanding lessons through integration" has shown a negative correlation of $-.100$, which is so negligible. The majority of teachers attempted to consider and relate classroom lessons to IK systems. Even though IK elements were given little attention in the new curriculum, these efforts of primary school teachers have shown good incentives, which go hand in hand with international education policymakers who began to pay attention to taking care of IK and its pedagogies by formulating protecting mechanisms and guidelines. Consistent with these international education policies are the findings of this current study, which discovered that primary school teachers in the Amhara region were attempting to practice classroom lessons in line with the interests of indigenous people. Similarly, Vygotsky's theory of social constructivism treats knowledge as constructed through interaction, experiences and activities doing with others on shared problems through harmonizing and disequilibrium. Teachers are required to provide learners with opportunities to construct their knowledge by having contacts with knowledgeable others. In addition, Gestalt theory concerned with creative and productive learning styles. The learner should grasp the essential relationships within experiences, grouping them into meaningful wholes. Looking for relationship in this case is helpful to identify whether there are commonalities or differences concerning components of contents of the two knowledge systems and making contrasts

in relation to the content values in line with owning socio-economic and political advantages of the indigenous people. Consistent to this theory finding of this current study indicated that primary school teachers were attempting interconnecting elements some of the indigenous values with classroom lessons. Therefore, if these teachers were well oriented with different ways of communicating with IK elements and develop their experiences to do so, there were indicators in this current study that teachers could do best in fusing the classroom lessons with different local experiences.

4.2 Findings from the analysis of challenges teachers' face

Alpha =.781 is the internal consistency reliability for thirteen items on a challenge scale. The inter-item correlation matrix has shown that most items are positively correlated in the range of.032 to.577. But a few items are negatively correlated. Alpha is.791 for the internal consistency and reliability of thirteen items on the "challenge" scale. The inter-item correlation matrix has shown that most items are positively correlated in the range of.028 to.660. But a few items listed below were negatively correlated. All these items were required to measure the challenges. Each item has the quality of measuring "challenge." The existence of some differences might be due to the difference in access to local resources or to differences in believing in the competency of IK systems between male and female teachers, which were the major findings.

One of the findings of this study concerning challenges was the scarcity of documented IK, which is consistent with the findings of Adeyemi and Adeyinka [45], who noted that the people who participate in the education practice were unable to write and keep records of educational events of the period (which were the main setbacks during that period). It is not documented; rather, IK is stored in people's memories and activities and is expressed in stories, songs, folklore, proverbs, dances, myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices, equipment, materials, plant species, and animal breeds [46]. This created challenges for local teachers and master craftsmen, as well as herbalists, in preserving their wisdom and knowledge systems for younger generations. If those possessors of IK pass away, the knowledge they possessed will also die. A typical example is the death of a traditional doctor without documenting the various herbs for healing the sick, so that all his knowledge will perish with him. On the other hand, IK is an endangered species. "When a knowledgeable person dies, the whole library disappears" [47]. This suggests that IK is primarily transmitted orally through generations through specific examples and cultural practices. Even though there is a lack of well-documented IK systems, the interviewee of this current study explained that indigenous values can be seen mostly in the practical life of society; the main challenge is that they have not been well studied and given attention. This discovery corroborated previous reports on Ethiopian IK systems, a few of which had been studied [48-52].

Another finding of this study was the existing culture of undermining our ancients' noble work. Both locals and foreigners have undermined IK holders and their products. As a

result, the World Bank reported in 1998 that IK faces a number of challenges. Great foreign-oriented cultural impositions on the indigenous peoples of a nation divorced indigenous peoples from their own vital IK elements. Without examining the true essence of its values, it appears that IK is not very magnificent in the eyes of Western scientists. Even though it is extremely effective, Western scientists dismiss IK as unimportant. IK is often overlooked because it seems "messy" and is not obvious to outsiders. However, according to the findings of this current study, by seemingly undermining or giving little value to indigenous values, foreigners took these IK elements, used them, and considered them their own inventions, i.e., foreigners (whites) have taken ours and used them as their own inventions. Abera (2017) found that the presence of such challenges made it impossible to incorporate indigenous values into the Ethiopian education system. Since its inception, the country has entertained either direct imitation or foreign ideas that dominate its educational system. Many people's skepticism about the effectiveness of their local knowledge systems in development lines is most likely fueled by external inputs [53]. Abebe and Vambe also noted that western thought and the academy unanimously considered African IK as superficial [54]. Because of the introduction of global and national experiences through various broadcasts, imported curriculum contents, the low status of their local languages to serve on the internet, in research, in the dissemination of reliable scientific information, and an overreliance on foreign technical assistance, the new generations are vulnerable to new values and lifestyles. This was due to IK systems not being clearly defined in the new curriculum, as the current study's findings revealed as another challenge teacher faced when integrating IK elements. Limited access to IK is another finding that poses a challenge in the present study and is likely similar to reports from UNESCO because it is not well organized and codified in terms of being indexed and abstracted [55-60].

5. Conclusion and Implications

Conclusions: - The outcomes of teachers' quantitative replies and interviews showed that majority of teachers attempted to incorporate IK elements into lesson planning and classroom instruction. Consistent with Vygotsky's theory of social constructivism and communication model, the findings of this current study indicated that primary school teachers were attempting to interconnect some elements of indigenous values with classroom lessons. But the frequency varies among teachers due to unknown reasons. Some teachers frequently incorporated indigenous values, some others considered the context sometimes, and a few others did not give due attention to local knowledge elements during planning the lesson. Teachers faced challenges due to the scarcity of documented IK, the existing culture of undermining our ancients' noble work (IK possessors and their work products were undermined by the local people themselves and foreigners), the fact that IK systems were not clearly defined in the new curriculum, and limited access to the areas of IK systems.

Implications: - If teachers with the approach of considering IK elements in their classroom teaching were well-oriented with

different ways of communicating with IK elements and developed their experiences to provide opportunities for the learners to construct knowledge, there would have been indicators in this current study that teachers could do best by fusing the classroom lessons with different local experiences. As a result of the findings of the study, some firm conclusions should be made for the new curriculum developers at the national and regional levels to create the means to minimize challenges and update classroom teachers in line with the inclusion of indigenous values in the classroom. Educational officials are also required to prepare different intentional workshops for educational professionals and for the local peoples as well with contents concerning the importance of IK elements to make them accepted by both the education system and the local people. Scholars in the field of education also should give due attention in collecting indigenous values and criticizing them and put them in documents so that teachers and even others could easily use these documents as references. It could also have national and global benefits if curriculum developers valued these findings in developing and implementing IK-integrated curricula capable of comprehending social realities and producing competent work forces capable of resolving socio-cultural and economic quandaries.

Limitations of the Study

The study ran into some problems. Some respective educational administration leaders in some areas were reluctant to give the researcher permission to collect data in the relevant schools as a result of the confusion brought on by the country's hostilities at the time. This briefly lengthened the time required to finish the action. In addition, some items in the questionnaire were portrayed by the researcher from the literature. It was better if the researcher used well-tested items to accurately assess the crucial data from the participants, even if some educational research specialists evaluated the validity of the items and the reliability of these items was checked by the reliability estimation method. In this case, the researcher thought that doing so might have some factors lowering the quality of the data collected for this study.

Acknowledgment

I wholeheartedly thank volunteers in the field of educational research for helping to validate whether the tools were indeed appropriate. My heartfelt thanks go to the primary school principals for making indebted sacrifices by giving time to forward authentic responses to the questionnaire and interview guides. I am also keen to send my warm thanks to my colleagues in the English department for cross-checking the translation.

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