

Contents lists available at ojs.aeducia.org
Journal of Gender and Millennium Development Studies
Volume 1, Issue 2 (2024),
Journal homepage: https://ojs.aeducia.org/index.php/jgmds

JGMDS
E-ISSN 3063-3850
P-ISSN 3063-3842

Strategies for Integrating Indigenous Knowledge in Primary Education and its Impacts on Sustainable Development and Inclusive Growth

Okeke Tobechukwu Ebele
Nwafor Orizu College of Education Nsugbe, Anambra State, Nigeria

ABSTRACT

Background: Incorporating indigenous knowledge into formal education systems has gained global attention as a means to promote cultural sustainability, environmental awareness, and inclusive development. However, in many regions like Nigeria, indigenous knowledge remains underutilized in primary education. **Objective:** This study aimed to explore strategies for integrating indigenous knowledge into primary education in Nigeria and examine its impact on sustainable development and inclusive growth. **Method:** A descriptive survey design was employed, involving 111 participants comprising primary school teachers, educational administrators, and indigenous community members across selected Local Government Areas (LGAs) in Nigeria. Data were collected using a structured questionnaire validated by experts and pilot-tested with 30 respondents, yielding a reliability coefficient of 0.74. Data analysis involved descriptive statistics and Chi-Square tests. **Result:** Findings revealed that integrating indigenous language in curriculum development and utilizing hands-on materials and experimentation significantly enhanced students' cultural and environmental understanding. Furthermore, these strategies fostered empathy, encouraged multicultural awareness, and led to improved educational outcomes among students from diverse backgrounds. **Conclusion:** The integration of indigenous knowledge into primary education supports sustainable development goals by enriching student learning and promoting inclusive educational practices. **Contribution:** This research provides practical insights for curriculum planners, educators, and policymakers on embedding indigenous knowledge systems into early education to drive sustainable and inclusive societal progress.

ARTICLE HISTORY

Submitted: October 6, 2024
Revised: October 26, 2024
Accepted: November 25, 2024
Published: December 29, 2024

KEYWORDS

Integrating Indigenous Knowledge;
Sustainable Development;
Inclusive Growth;
Primary Education

1. INTRODUCTION

Ensuring that indigenous knowledge is taught right from the primary level classes is crucial to achieving inclusive sustainable development since several indigenous communities' support Nigeria's education system. It is crucial to understand indigenous knowledge since it holds cultural knowledge that has taken centuries to develop and covers local knowledge specific to the circumstance of an environment and its social surroundings (Dasilva et al, 2023). Such knowledge can greatly enhance students' educational processes and at the same time promote other microbiological goals like ecology, economics, and social integration. The literature on integrating indigenous knowledge in primary education highlights several effective strategies and underscores its profound impacts on sustainable development and inclusive growth (Njoh et al, 2024).

* **Corresponding Author:** Okeke Tobechukwu Ebele, okekete15002f@gmail.com

Department of Primary Education, Nwafor Orizu College of Education Nsugbe, Anambra State, Nigeria
Address; No. 1 college road, Abata, Nsugbe 432108, Anambra, Nigeria

How to Cite (APA Style 7th Edition):

Ebele, O. T. (2024). Strategies for Integrating Indigenous Knowledge in Primary Education and its Impacts on Sustainable Development and Inclusive Growth. *Journal of Gender and Millennium Development Studies, 1*(2), 93-105. https://ojs.aeducia.org/index.php/jgmds/article/view/159

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One of the primary strategies involves working with indigenous elders and community leaders to design curricula. Older people possess the knowledge, beliefs, and values and the histories of indigenous communities. This involvement assists in maintaining the adequate relevance and the accuracy of the curriculum. In their perspective, as aptly illustrated by Mehta et al, (2022), offering a voice to indigenous elders ensure that cultural values are sustained as student gets the best lesson on their traditions. Furthermore, practice partnerships foster culturally relevant curriculum implementation so that students not only gain formal knowledge, but also become engaged with the indigenous culture and its context within which they exist (Bessette et al, 2023). It assists in raising appreciation for the indigenous practices so that knowledge is transferred from one generation to another.

Another useful method of teaching indigenous knowledge within classrooms is adaptations for use of indigenous stories, myths and languages within classroom learning. The use of storytelling is a conventional way of passing on culture, ethos and experiences in most of the Nigerian societies. In his or her work, Bessette et al, (2023) opine that showing students teaching activities in indigenous languages and storytelling assist the learner to embrace their culture and fosters language retention. In addition, although the practice fosters bilingualism and since globalization is on the rise, many languages which are on the brink of extinction are protected (Goforth et al, 2024). Enticing stories increase creativity and critical thinking abilities, as well as the students' cultural self-identity.

The other significant intervention strategy in enhancing the implementation of indigenous knowledge in the primary education system is mainstreaming of indigenous content in diverse studies subjects. Indigenous knowledge is cross-discipline since it tackles issues of farming, health, ecology, societies and community. As pointed out by Mehta et al, (2022) use of indigenous ecological knowledge in preparation for science lessons make students be in a position to learn different procedures of sustainable farming, natural resource and conservation measures based on indigenous knowledge. The approach also adds the value of developing the student's practical skills and enabling them to think about environmental sustainability. Furthermore, the incorporation of indigenous knowledge in different courses enables eradicating the dichotomy between formal/modern and traditional knowledge hence developing an enhanced instructional model (Druker-Ibanez et al, 2022).

Thus, for the conduct of culturally appropriate educational materials and resources these are crucial steps when co-constructing indigenous knowledge into educators guides. Teachers, authors, graphic designers and content creators in texts and visuals for education, including textbooks, graphic displays, illustrations and digital media, should represent indigenous people and knowledges. As Oladejo et al, (2022) pointed out, use of culturally-relevant materials enhances equality and learning achievement hence does benefit indigenous learners who might think of the existing curriculum as irrelevant to their daily lives. Using indigenous cultures to improve learner's culture relevance positively influences students' interaction with books/lessons (Olayemi, 2023).

Other learning activities related to conventional practice also support the incorporation of indigenous knowledge in teaching and learning. It is also possible to introduce students to indigenous methods of agriculture, fishing, and other forms of production, giving them knowledge of practices that they would otherwise only get from using them in practice. According to Guberina (2023), the use of traditional farming practices by students in schools enable them grasp concepts such as crop rotation, soil management and organic Farming. These activities make students develop skills to deal with everyday life issues while at the same enriching their perspective of and with the environment and community respectively (Zhang & Noels, 2024). Furthermore, I agree with the idea that hands-on learning will assist to confirm the practical applicability of the indigenous knowledge and enhance learners' interest in local plus academic resources.

This paper discussed the implications that accustoming to the integration of indigenous knowledge in primary education has on sustainable development. This paper will have identified environmental stewardship as one of the main impacts. Hence, IK is grounded within an appreciation of the ecosystem and the management of resources in indigenous contexts that correspond with current environmental objectives. In this paper by Eden et al, (2024), it is proposed that the use of approaches that include inter cropping, organic farming, water conservation are normally in line with sustainability goals and when these approaches are taught in school, it will help students understand ecological conservation. Besides, indigenous knowledge enhances students' appreciation of stewardship duties towards environment conservation since they are well informed about the need to balance human impact on the environment (Shim & Yoon, 2024).

Besides being adopted as the main agenda on environmental sustainability, the implementation of knowledge within the education system is also inclusive of benefits to the indigenous people. Their integration help everybody feel valued at school and ensure that students of color from indigenous backgrounds are represented in the curriculum. This helps reduce the marginalization of indigenous students, who often feel alienated in a system that prioritizes Western educational models (Njoh et al, 2024). Since schools proactively incorporate indigenous know-

ledge in their lessons, learning activities help support social integration. Druker-Ibanez & Caceres-Jensen (2022) says that it helps enhance the learning for indigenous students while at the same time assist other students to be more sensitive to cultural diversity and difference, embrace diversity and respect for diversity.

Moreover, adding indigenous knowledge brings in cultural diversity in the system of learning. Indigenizing learning environment produces engagements with different cultures scores and making students understand the value of cultural practices. As acknowledged by Bessette et al, (2023), learning indigenous ideas builds awareness of global problems and intercultural relations. Such exposure assist a student to cultivate kindness, togetherness, important factors as students phase them into living in a society that is becoming culturally diverse and globally connected (Sanusi et al, 2024). This in turn translates to more equal growth since the students out in their communities have learned to appreciate diversity.

Professional development about indigenous knowledge is desirable for primary education to incorporate such knowledge for use by educators. Most of the teachers lack knowledge regarding indigenous knowledge system and with out adequate training, they might not implement these two perspectives appropriately. Oladejo et al, (2022) has called for the development of professional development designs and tools that can enable teachers be pro Leone Standard V Indigenously initiated and maintained teacher education programs. Training and coaching through workshops and indigenous people, and subsequently encouragement is the key to making certain that teachers will give culturally competent training. Offering such opportunities to the teachers will enhance their ability of incorporating indigenous worldview into classrooms (Olayemi, 2023). The rationale for the present study emanates from the fact that conventional curricula leave out local cultures and knowledge systems. While formal education focuses heavily on Western knowledge systems, indigenous perspectives remain underrepresented, limiting their potential contribution to sustainable development and inclusive growth (Okwuduba et al, 2022). Research suggests that incorporating indigenous knowledge could enhance environmental stewardship, cultural preservation, and educational inclusivity. However, insufficient resources, training, and curriculum development hinder its integration, highlighting the need for targeted strategies and policies.

1.1 Research questions

This study seeks to explore the following research questions: (1) What are the effective strategies for integrating indigenous knowledge into primary education curricula?; (2) How does incorporating indigenous knowledge impact sustainable development goals?; (3) What are the effects of integrating indigenous knowledge on inclusive growth and cultural diversity?; (4) What are the professional development needs of educators for the effective integration of indigenous knowledge?

1.2 Hypotheses

The hypotheses of this study are as follows: (1) There are no effective strategies for integrating indigenous knowledge into primary education curricula across different school locations; (2) Incorporating indigenous knowledge has no significant impact on sustainable development goals across different school locations; (3) The integration of indigenous knowledge does not significantly affect inclusive growth and cultural diversity across different school locations; (4) Educators do not have specific professional development needs for effectively integrating indigenous knowledge across different school locations

2. METHOD

2.1 Research Design

This study employed descriptive survey research technique. The study was carried out in Anambra state Nigeria. The state was chosen for considering the cultural diversity and the presence of indigenous knowledge systems that were still actively practiced.

2.2 Research Object

The population of the study consisted of primary school teachers, educational administrators, and community leaders within the selected local governments. The sample size consisted of 111 respondents. In this case, structured questionnaire served as the main sources of data collection.

2.3 Data Collection

The questionnaire consisted of questions, divided into three sections: The research questions include: (1) the strategies for incorporating indigenous knowledge, (2) effects on sustainable development as perceived by the participants, and (3) effects on inclusive growth as perceived by the participants. Since the creation of the instrument, face and content validation were conducted by professionals specializing in educational research, indigenous studies, and curriculum designing.

2.4 Data Analysis

The reliability of the developed questionnaire when filling it out was ascertained through a pilot study conducted with thirty respondents who were not part of the convenience sample. The reliability analysis of the items were established by Cronbach alpha method where the acceptability level was set at 0.74. Data collection started with the use of the questionnaire which was used to reach the respondents. Questionnaires were distributed online using the Google survey system. Data collection spanned six weeks to allow sufficient time for responses from all participant groups. Descriptive analysis and Chi-Square tests were used to evaluate educators' professional development needs and the practical application of indigenous knowledge in school locations. Descriptive statistics such as, mean, standard deviation, variance, skewness, and kurtosis were used to summarise the responses and the bootstrapping technique was used to give better estimates of confidence intervals. High mean values indicated educators' agreement on the importance of professional development aspects, such as training and resource development. Chi-Square tests were conducted to explore the relationships between school location and the integration of indigenous knowledge. The Chi-Square test outcomes relied on p-values to determine statistical significance.

3. RESULT AND DISCUSSION

3.1 Result

Table 1. School Location Distribution of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	62	55.9	55.9	55.9
	Rural	49	44.1	44.1	100.0
	Total	111	100.0	100.0	

Details about the respondents' school location are provided in Table 1. There are 62 urban respondents, which take up 55.9% of total sample, whereas there are 49 rural respondents, and these represent 44.1 % of total sample. The total number of respondents is 111, though it has a higher prevalence of urban schools than the rural schools.

Table 2. Gender Distribution of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	39	35.1	35.1	35.1
	Female	72	64.9	64.9	100.0
	Total	111	100.0	100.0	

Table 2 indicates gender profile of the respondents with 72 females constituting 64.9% and 39 males constituting 35.1%. The total number of respondents are one hundred and eleven, most of who are female; the demographic ratio of gender is therefore representative of the total sample collection.

Table 3. Educational Qualification of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NCE	30	27.0	27.0	27.0
	B.Ed	68	61.3	61.3	88.3
	M.Ed	13	11.7	11.7	100.0
	Total	111	100.0	100.0	

Table 3 also shows that a total of 111 respondents participated in the study; 30 of the respondents held NCE, 68 had B.Ed, while the remaining 13 had M. Ed. The cumulative percentage reached 100.0%.

Research question 1: What are the effective strategies for integrating indigenous knowledge into primary education curricula?

Table 4. Descriptive Statistics for Effective Strategies for Integrating Indigenous Knowledge into Primary Education Curricula

			Bootstrap[a]			
					95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
Collaborate with indigenous elders for curriculum development and design.	N	111	0	0	111	111
	Mean	3.25	.00	.05	3.16	3.35
	Std. Deviation	.513	-.002	.031	.446	.572
	Variance	.263	-.001	.032	.199	.327
	Skewness	.296	.027	.244	-.079	.908
	Kurtosis	-.289	-.031	.434	-1.140	.689
Incorporate indigenous stories and languages into classroom activities.	N	111	0	0	111	111
	Mean	3.48	.00	.05	3.37	3.59
	Std. Deviation	.601	-.004	.035	.534	.669
	Variance	.361	-.004	.042	.285	.448
	Skewness	-.681	.021	.184	-1.010	-.300
	Kurtosis	-.475	-.049	.252	-1.057	.029
Integrate indigenous perspectives across various subject areas in lessons.	N	111	0	0	111	111
	Mean	3.29	.00	.05	3.19	3.40
	Std. Deviation	.529	-.004	.030	.466	.583
	Variance	.280	-.004	.031	.217	.340
	Skewness	.170	.041	.236	-.184	.728
	Kurtosis	-.539	-.032	.391	-1.406	.199
Develop culturally relevant materials and resources for educators.	N	111	0	0	111	111
	Mean	3.57	.00	.05	3.48	3.66
	Std. Deviation	.498	-.002	.007	.477	.502
	Variance	.248	-.002	.007	.227	.252
	Skewness	-.277	-.007	.202	-.674	.091
	Kurtosis	-1.959	.045	.135	-2.037	-1.575
Implement hands-on activities that reflect traditional indigenous practices.	N	111	0	0	111	111
	Mean	3.09	.00	.07	2.94	3.23
	Std. Deviation	.781	-.004	.053	.672	.884
	Variance	.610	-.004	.083	.452	.781
	Skewness	-.626	.024	.161	-.910	-.263
	Kurtosis	.124	-.033	.436	-.754	1.028
Valid N (listwise)	N	111	0	0	111	111

Table 4 presents descriptive statistics for effective strategies in integrating indigenous knowledge into primary education curricula. The highest mean score was for developing culturally relevant materials (mean = 3.57), indicating strong support for this strategy. Incorporating indigenous stories and languages scored 3.48, reflecting its significance. Collaborating with elders received a mean of 3.25, while integrating indigenous perspectives across subjects scored 3.29. Hands-on activities reflecting traditional practices had the lowest mean (3.09), suggesting a need for enhancement.

Research question 2: How does incorporating indigenous knowledge impact sustainable development goals?

Table 5. Descriptive Statistics for the Impact of Incorporating Indigenous Knowledge on Sustainable Development Goals

			Bootstrap[a]			
					95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
Enhances students' understanding of environmental stewardship and sustainability.	N	111	0	0	111	111
	Mean	3.41	.00	.07	3.26	3.53
	Std. Deviation	.718	-.006	.076	.553	.855

			Bootstrap[a]			
					95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
	Variance	.516	-.002	.109	.306	.731
	Skewness	-1.534	.074	.226	-1.778	-.872
	Kurtosis	3.250	-.220	.680	1.522	3.977
Promotes traditional ecological practices contributing to sustainability goals.	N	111	0	0	111	111
	Mean	3.25	.00	.06	3.14	3.36
	Std. Deviation	.610	-.004	.033	.539	.671
	Variance	.372	-.003	.040	.291	.451
	Skewness	-.194	.016	.128	-.421	.100
	Kurtosis	-.538	.003	.172	-.808	-.075
Improves students' awareness of local ecosystems and conservation.	N	111	0	0	111	111
	Mean	3.58	.00	.05	3.49	3.67
	Std. Deviation	.496	-.002	.008	.474	.502
	Variance	.246	-.002	.008	.224	.252
	Skewness	-.314	-.006	.206	-.717	.055
	Kurtosis	-1.936	.047	.154	-2.037	-1.514
Encourages students to participate in local sustainability initiatives.	N	111	0	0	111	111
	Mean	3.48	.00	.06	3.36	3.59
	Std. Deviation	.601	-.003	.035	.533	.668
	Variance	.361	-.003	.043	.284	.446
	Skewness	-.681	.020	.182	-1.014	-.278
	Kurtosis	-.475	-.048	.260	-1.090	.033
Contributes to sustainable development by applying traditional knowledge.	N	111	0	0	111	111
	Mean	3.21	.00	.06	3.08	3.32
	Std. Deviation	.620	-.004	.034	.547	.681
	Variance	.384	-.004	.042	.299	.463
	Skewness	-.165	.017	.109	-.359	.077
	Kurtosis	-.516	.010	.195	-.824	-.025
Valid N (listwise)	N	111	0	0	111	111

Table 5 illustrates the impact of incorporating indigenous knowledge on sustainable development goals. Students' awareness of local ecosystems and conservation scores the highest mean (3.58), suggesting significant impact. Understanding environmental stewardship and sustainability also shows a strong mean (3.41). Participation in local sustainability initiatives (mean = 3.48) and promotion of traditional ecological practices (mean = 3.25) reflect positive trends. However, contributing to sustainable development through traditional knowledge has the lowest mean (3.21).

Research question 3: What are the effects of integrating indigenous knowledge on inclusive growth and cultural diversity?

Table 6. Descriptive Statistics for the Effects of Integrating Indigenous Knowledge on Inclusive Growth and Cultural Diversity

			Bootstrap[a]			
					95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
Increases students' empathy and cultural awareness in diverse settings.	N	111	0	0	111	111
	Mean	3.46	.00	.06	3.34	3.57
	Std. Deviation	.600	-.002	.032	.536	.661
	Variance	.360	-.001	.039	.287	.437
	Skewness	-.614	.019	.177	-.957	-.246
	Kurtosis	-.544	-.035	.224	-1.144	-.087
Supports the inclusion of indigenous perspectives in school activities.	N	111	0	0	111	111
	Mean	3.28	-.01	.06	3.15	3.40
	Std. Deviation	.649	-.002	.035	.575	.715

			Bootstrap[a]			
					95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
	Variance	.421	-.001	.046	.330	.511
	Skewness	-.347	.021	.122	-.578	-.086
	Kurtosis	-.699	.003	.131	-.988	-.437
Encourages participation in multicultural events and learning experiences.	N	111	0	0	111	111
	Mean	3.44	.00	.05	3.32	3.54
	Std. Deviation	.567	-.002	.028	.516	.620
	Variance	.322	-.002	.032	.266	.385
	Skewness	-.375	.028	.205	-.715	.082
	Kurtosis	-.811	-.045	.293	-1.546	-.472
Boosts educational outcomes for students from diverse cultural backgrounds.	N	111	0	0	111	111
	Mean	3.29	.00	.06	3.17	3.39
	Std. Deviation	.594	-.002	.034	.525	.657
	Variance	.352	-.002	.040	.276	.431
	Skewness	-.186	.027	.157	-.461	.181
	Kurtosis	-.554	-.008	.170	-.840	-.143
Strengthens the cultural inclusivity of the school environment and curriculum.	N	111	0	0	111	111
	Mean	3.43	.00	.05	3.32	3.53
	Std. Deviation	.566	-.002	.029	.513	.627
	Variance	.320	-.002	.033	.264	.394
	Skewness	-.342	.031	.209	-.691	.128
	Kurtosis	-.824	-.050	.293	-1.546	-.502
Valid N (listwise)	N	111	0	0	111	111

Table 6 shows the effects of integrating indigenous knowledge on inclusive growth and cultural diversity. Respondents indicated that this integration increases students' empathy and cultural awareness (Mean = 3.46), supports the inclusion of indigenous perspectives (Mean = 3.28), and encourages participation in multicultural events (Mean = 3.44). It also boosts educational outcomes (Mean = 3.29) and strengthens cultural inclusivity (Mean = 3.43). These findings underscore the positive impact of indigenous knowledge on educational practices and cultural dynamics.

Research question 5: What are the professional development needs of educators for the effective integration of indigenous knowledge?

Table 7. Descriptive Statistics for the Professional Development Needs of Educators for the Effective Integration of Indigenous Knowledge

			Bootstrap[a]			
					95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
Provide training on incorporating indigenous perspectives into lesson plans.	N	111	0	0	111	111
	Mean	3.39	.00	.06	3.26	3.50
	Std. Deviation	.620	-.002	.035	.551	.690
	Variance	.385	-.002	.043	.303	.476
	Skewness	-.491	.021	.159	-.780	-.124
	Kurtosis	-.622	-.024	.127	-.957	-.403
Develop resources to support teachers in teaching indigenous knowledge.	N	111	0	0	111	111
	Mean	3.45	.00	.05	3.34	3.55
	Std. Deviation	.568	-.002	.029	.517	.626
	Variance	.323	-.001	.033	.267	.392
	Skewness	-.409	.025	.203	-.781	.012
	Kurtosis	-.794	-.048	.303	-1.542	-.369
Offer workshops on culturally responsive teaching and indigenous integration.	N	111	0	0	111	111
	Mean	3.43	.00	.05	3.32	3.54
	Std. Deviation	.566	-.004	.028	.508	.615
	Variance	.320	-.004	.032	.258	.379

			Bootstrap[a]			
					95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
	Skewness	-.342	.035	.207	-.691	.128
	Kurtosis	-.824	-.067	.309	-1.547	-.502
Create opportunities for teachers to collaborate with indigenous community members.	N	111	0	0	111	111
	Mean	3.46	.00	.07	3.31	3.59
	Std. Deviation	.772	-.005	.077	.609	.911
	Variance	.596	-.001	.118	.371	.830
	Skewness	-1.612	.044	.194	-1.975	-1.203
	Kurtosis	2.545	-.106	.846	.990	4.325
Provide ongoing support and resources for implementing indigenous knowledge.	N	111	0	0	111	111
	Mean	3.50	.00	.07	3.36	3.64
	Std. Deviation	.773	-.005	.081	.600	.918
	Variance	.598	-.001	.123	.360	.843
	Skewness	-1.758	.039	.218	-2.170	-1.309
	Kurtosis	2.923	-.076	1.032	1.162	5.142
Valid N (listwise)	N	111	0	0	111	111

Table 7 shows that educators strongly perceive the need for ongoing support and resources for integrating indigenous knowledge, with a mean score of 3.50 (SD = 0.773). Additionally, developing resources for teaching indigenous knowledge (mean = 3.45, SD = 0.568) and creating collaboration opportunities with indigenous communities (mean = 3.46, SD = 0.772) are also prioritized. Overall, the findings indicate a significant demand for professional development in these areas among the 111 participants.

Hypothesis 1: There are no effective strategies for integrating indigenous knowledge into primary education curricula across different school locations

Table 8. Chi-Square Test Results on effective strategies for integrating indigenous knowledge into primary education curricula

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.488[a]	6	.371
Likelihood Ratio	9.102	6	.168
Linear-by-Linear Association	.513	1	.474
N of Valid Cases	111		

a. 5 cells (35.7%) have expected count less than 5. The minimum expected count is 1.32.

Chi-Square Test results for this study show that Chi-Square equals 6.488 with a significance level of 0.371 at 2 degrees of freedom. Since the value is above 0.05, they do not agree to the rejection of the null hypothesis, indicating the absence of measures for incorporating indigenous knowledge into primary education curriculum in the different schools' stations. Additionally, the presence of cells with low expected counts may affect the reliability of these results.

Hypothesis 2: Incorporating indigenous knowledge has no significant impact on sustainable development goals across different school locations

Table 9. Chi-Square Test Results on impact of incorporating indigenous on sustainable development goals

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.746[a]	6	.047
Likelihood Ratio	16.308	6	.012
Linear-by-Linear Association	.895	1	.344
N of Valid Cases	111		

a. 4 cells (28.6%) have expected count less than 5. The minimum expected count is 3.97.

The chi-square test results in table 9 show a Pearson Chi-Square value of 12.746 with a significance level of 0.047, which is below the 0.05 threshold. This indicates that incorporating indigenous knowledge has a significant impact on sustainable development goals across different school locations. Since the p-value is less than 0.05, the

null hypothesis is rejected, meaning the hypothesis that indigenous knowledge has no significant impact is not supported.

Hypothesis 3: The integration of indigenous knowledge does not significantly affect inclusive growth and cultural diversity across different school locations

Table 10. Chi-Square Test Results on integration of indigenous knowledge effect on inclusive growth and cultural diversity

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.617[a]	7	.082
Likelihood Ratio	15.910	7	.026
Linear-by-Linear Association	.107	1	.743
N of Valid Cases	111		

a. 9 cells (56.3%) have expected count less than 5. The minimum expected count is 1.77.

The Pearson Chi-Square test result in table 10 shows a value of 12.617 with a significance level of 0.082, which is greater than the standard threshold of 0.05. This indicates that the hypothesis cannot be rejected, meaning there is no significant effect of integrating indigenous knowledge on inclusive growth and cultural diversity across different school locations. However, the Likelihood Ratio suggests some association ($p = 0.026$).

Hypothesis 4: Educators do not have specific professional development needs for effectively integrating indigenous knowledge across different school locations

Table 11. Chi-Square Test Results on Educators' Professional Development Needs for Integrating Indigenous Knowledge Across School Locations

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.416[a]	8	.001
Likelihood Ratio	33.054	8	.000
Linear-by-Linear Association	.034	1	.854
N of Valid Cases	111		

a. 8 cells (44.4%) have expected count less than 5. The minimum expected count is 1.77.

The Chi-Square test table 11 reveals a Pearson Chi-Square value of 25.416 with 8 degrees of freedom and a p-value of .001, indicating a statistically significant association between school location and educators' professional development needs for integrating indigenous knowledge. The Likelihood Ratio of 33.054 ($p = .000$) further supports this significance. However, the Linear-by-Linear Association shows no significant linear relationship ($p = .854$). Since the p-value is below the 0.05 threshold, the null hypothesis is rejected. Therefore, educators do have specific professional development needs across different school locations for integrating indigenous knowledge effectively.

3.2. Discussion

Integrating indigenous knowledge into primary education curricula is essential for fostering cultural awareness and respect. Collaborating with indigenous elders for curriculum development is vital; this finding agrees with Bessette et al, (2023), which highlights the importance of including community voices. In contrast, traditional curricula often overlook these perspectives, leading to a disconnection from cultural heritage. Incorporating indigenous stories and languages into classroom activities enhances student engagement, as shown in a related study by Benabbes and Taleb (2024), which found that storytelling promotes language skills and cultural appreciation. Furthermore, integrating indigenous perspectives across various subjects enriches learning, echoing the research of Orlove et al, (2023), which emphasizes the interconnectedness of knowledge systems. Developing culturally relevant materials and resources for educators supports effective teaching, yet many educators lack access to such tools (Shim & Yoon, 2024). Hands-on activities reflecting traditional practices, such as farming or crafts, provide practical learning experiences; however, in contrast, some curricula remain rigid and disconnected from local traditions. Ultimately, the absence of effective strategies for integrating indigenous knowledge across diverse school locations hinders meaningful educational experiences, underscoring the need for systemic change to include these valuable perspectives in primary education.

Incorporating indigenous knowledge into education significantly impacts the achievement of Sustainable Development Goals (SDGs). For instance, it enhances students' understanding of environmental stewardship and sustainability, aligning with the findings of Goforth et al, (2024), who observed that students exposed to indigenous

practices displayed better engagement with sustainable practices. In contrast, Mehta et al, (2022) argued that while indigenous knowledge boosts understanding, the absence of a structured curriculum can limit its long-term retention. Promoting traditional ecological practices, as shown Haq et al, (2023), aligns with SDG 15 on life on land. Furthermore, improving students' awareness of local ecosystems through indigenous knowledge, as noted in Druker-Ibanez & Caceres-Jensen (2022) research, contributes to biodiversity conservation efforts, an aspect emphasized in SDG 14. Incorporating this knowledge, as various studies suggest, contributes significantly to sustainable development through the practical application of time-tested practices that foster resilience in local ecosystems.

Integrating indigenous knowledge has varying effects on inclusive growth and cultural diversity across different school locations. For instance, it increases students' empathy and cultural awareness, as noted by Eden et al, (2024), who observed enhanced social cohesion among students exposed to indigenous traditions. In contrast, Zhang & Noels (2024) argued that while empathy increased, it did not necessarily lead to meaningful intercultural collaboration in some schools. Supporting the inclusion of indigenous perspectives, Akinnubi et al, (2024) agreed with earlier findings, emphasizing that such inclusion in school activities promotes respect for diverse cultures, which aligns with inclusive growth objectives. Encouraging participation in multicultural events, as found in a related study by Ezeanya et al, (2024), boosts students' engagement with diverse learning experiences, contributing to their overall educational development. However, this finding contrasted with Okwuduba et al, (2022), who noted that the impact of such initiatives on inclusive growth remained minimal in some regions due to limited institutional support. Strengthening the cultural inclusivity of the school environment and curriculum, as observed by Guberina (2023), boosts educational outcomes for students from diverse backgrounds, promoting cultural diversity, though its effects on inclusive growth across different locations are not universally significant.

Educators require professional development in incorporating Indigenous perspectives into lesson plans to enhance cultural inclusivity. In contrast, a study by Njoh et al, (2024) found that teachers often lack practical skills in integrating Indigenous content. This finding agreed with Dasilva et al, (2023) study, which emphasized the importance of developing resources to help teachers navigate Indigenous knowledge systems effectively. In a related study, Olayemi (2023) explored how workshops on culturally responsive teaching can aid educators in building confidence when incorporating Indigenous elements. Similarly, Oladejo et al, (2022) argued that providing ongoing workshops can positively impact teacher preparedness for Indigenous integration. Additionally, collaboration with Indigenous community members is critical. Teachers who engage with Indigenous stakeholders tend to create more authentic and respectful learning environments. Lack of collaboration leads to superficial content integration, often misunderstood by students. Ongoing support, as suggested by Sanusi et al, (2024), ensures that teachers continuously evolve their knowledge and instructional techniques, enhancing the implementation of Indigenous knowledge systems in the classroom.

4. IMPLICATIONS AND CONTRIBUTIONS

Implication. Strengthening local wisdom-based policies: This research can encourage governments and educational institutions to develop policies that support the integration of indigenous knowledge in the basic education curriculum. This includes developing flexible policies to include local values in the national or regional curriculum.

Contribution. Research on strategies for integrating indigenous knowledge in basic education has far-reaching impacts and can make a real contribution to efforts to achieve inclusive, relevant and sustainable education.The results of this research are expected to address inequalities in access to local knowledge, improve skills and values relevant to community needs, and strengthen the role of education in achieving sustainable development that is fair and inclusive for all.

5. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Limitation. There were observed difficulties in professional development for educators regarding differentiated instruction, and that more training resources need to be devised to make these strategies work. The use of indigenous knowledge in the teaching and learning of primary education is a significant strategy of delivering SDGs and encouraging development within societies. The study recommends an improved policy environment that enhances inclusion of indigenous voice in education to encourage justice in educational settings.

Recommendation. This research can provide a model for the integration of indigenous knowledge in the basic education curriculum that is relevant and easy to implement. This model can serve as a reference for the

development of a more inclusive national curriculum that recognizes cultural diversity and local needs across the region.

6. CONCLUSION

The findings of the study underlined the importance of using indigenous knowledge for reaching sustainable development and advancing cognitive growth. The study pointed to the need for gearing indigenous elders in curriculum formulation so as to put emphasize on relevancy and realism in the educational contexts. Accommodating indigenous stories, languages and practices in the classroom helps in enhancing learning and to assists in developing identity and belonging amongst students as will be evident from the following activities. Furthermore, the incorporation of indigenous knowledge makes a valuable contribution to the concept of sustainable development objectives, increasing students' awareness of management of the natural resources and promoting their active involvement in environmental projects of the community. Such an educational model fosters students' concern of local ecosystems and such traditional ecological knowledge, thus involving students in active roles in addressing community environmental issues.

Going from the analysis demonstrated that the embedding of indigenous knowledge did not only enhance environmental positive impacts but also affected the inclusive growth and culture. Promoting cultural understanding increases unity within culturally diverse learning environment and student success from culturally diverse background. Focusing on implementing the cultural diversity raises the quality of school climate and increases tolerance and communication between students. However, successful integration of indigenous knowledge into primary education requires targeted professional development for educators. This paper concludes that training, resources, and constant support still hold as cornerstones of empowering teachers with the kind of skill and confidence required in the realization of these strategies. Thus, indigenous knowledge enlightening in the education can be seen both as a process fulfilling the educational needs of children and as an avenue leading to the accomplishment of social, environmental, and even the economic goals. In adopting such strategies in those institutions, a better future is realized in terms of equity and sustainability of the communities in questions as well as producing generations of informed citizens with cultural sensitivity

Acknowledgments

The authors would like to thank the colleagues who have facilitated the authors during this research process.

Author Contribution Statement

The author declares that this article's entire research and writing process was carried out independently. The author is fully responsible for all data related to this research. No other party has participated as an author or made a significant contribution to the content of this work.

Conflict of Interest Statement

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Approval Statement

The author declares that this study was conducted in accordance with research ethics principles and has received ethical approval from the author's institution, including respect for participants' autonomy, confidentiality of data, and ensuring their safety and well-being, as outlined in the applicable research ethics guidelines.

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Article Information

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First Publication Right:
Indonesian Journal of Character Education Studies

Article info:
https://ojs.aeducia.org/index.php/jgmds/article/view/159

Word Count: 6703

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