



Awareness and Implementation of Ethn curriculum among Biology Teachers in Secondary School in Obio/Akpor Local Government Area of Rivers State, Nigeria

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Abstract. The teaching and learning Biology in secondary school often relies on conventional methods, examples and contexts foreign to learners' live experiences. And this does not increase learners understanding and comprehension of Biology concept, and engagement. Ethn curriculum offer a way to bridge this gap by integrating indigenous knowledge and local practices into Biology teaching and instruction. This study examined the awareness and implementation of ethn curriculum among secondary school Biology teachers in Obio/Akpor Local Government Area of Rivers State. The population of the study include all the Biology teachers in public secondary school in the study area. The study adopted descriptive survey design. Data was collected from 150 biology teachers selected through random sampling techniques using self-structured questionnaire. This instrument was use to collected data on teachers' awareness of ethn curriculum, the implementation, the perceived benefit and the challenges in Biology teaching and learning. Data collected was analysed using mean statistics. Results indicated that Biology teachers had some awareness of ethn curriculum because they have read some literature on indigenous knowledge and ethn curriculum, but implementation was low. Major challenges identified include time constraints, inadequate training on integrating indigenous knowledge and lack of instructional materials with local examples. It was therefore recommended among others things that: Biology teachers should create opportunities for learners to share indigenous knowledge and experiences related to plant, and animals during classroom interaction. Educational authorities should organise regular workshops, seminars, and professional development programs to improve Biology teachers' understanding of ethn curriculum and its application in classroom instruction.

Keywords: Ethn curriculum, Biology education, Biology teachers, Teacher's awareness, curriculum Implementation, Indigenous knowledge, secondary school education.

1. Introduction

Biology is a subject offered in senior secondary schools. It is a very important subject. The secondary school Biology curriculum is designed to continue students' investigation into natural phenomena, expand learners understanding and awareness in biological sciences and help students' ability to relate scientific knowledge to everyday life in issues of personal community, health, agriculture, among others (Federal ministry of education, in Ndukwe et al, 2021). Green (2026) stated that Biology is the study of living things and their vital processes. The field deals with all the physiochemical aspect of life. As a field of science, Biology helps learners understand the living world and the ways its many species function, evolve, and interact. Nwakamma and Edokpolor (2026) also stated that Biology is foundational to science education and underpins learners understanding of life processes, ecological system and human health. It is one of the major science subjects taught in secondary school in Nigeria (Michael, 2024). The knowledge gain in Biology is relevant, thereby making it essential for national development survival. Despite its importance many learners perform poorly in Biology because of infective teaching method and inability of some teachers to teach Biology using some indigenous knowledge and instructional materials. Also, the teaching of biology in many secondary schools remains largely dependent on conventional instructional approaches that overlook the rich indigenous knowledge available within local communities, consequently, students may perceive

Biology as abstract and disconnected from their immediate environment.

Education serves as an important instrument for preserving cultural heritage, promoting societal development, and facilitating the transmission of knowledge across generation. In contemporary educational practice, there is increasing recognition of need to integrate indigenous knowledge systems into formal school curricula in order to make learning more relevant to learners' culture and environmental contexts. This approach has given rise to the concept of ethnocurriculum, which emphasizes the incorporation of indigenous knowledge, beliefs, values, and practices into teaching and learning processes (UNESCO, 2021; Kim & Dionne, 2023).

Ethnocurriculum refers to the deliberate integration of indigenous knowledge, cultural values, local experiences, and community practices into formal educational programme (Aikenhead & Michell, 2011). It is an educational framework that integrates local indigenous knowledge, cultural traditions and community values into standard subjects. It normally use local heritage to make learning more relevant and to preserve cultural identity (Ugwu, 2018). Ethnocurriculum according to Gandasari, (2026) is an educational vehicle that formalizes indigenous knowledge to ensure the transmission and survival of a community's cultural heritage within the school system. It can also be defined as the method of linking students' cultural background with academic content to improve engagement, literacy, and scientific understanding (Chotimah et al., 2026). It is an approach to curriculum design that actively integrates indigenous and local knowledge system into formal education to challenge colonial education legacies (Rodriguez & Silva, 2025). Pratama et al (2023) opined that ethnocurriculum is a curriculum model where local knowledge, practices and community norms serve as the primary foundation topics for classroom instruction. According to Martinez and Gomez, (2025), ethnocurriculum is a pedagogical structure that prioritizes interaction between different cultural groups, fostering social cohesion and mutual respect within a diverse classroom. Karakus (2021) stated that ethnocurriculum is an educational model that addresses the gap between national curriculum goals and classroom realities by adapting materials to the specific cultural and social realities of the student body. It is a curriculum structure that focused on building student confidence and sense of belonging by affirming their ethnic and cultural identities through course materials (Asiyah et al., 2021). It is a curriculum that validates diverse ways of knowing, treating local or traditional knowledge as equal in

status to formal, standardized academic knowledge (Ferreira, 2025). Hassan (2024) explained that ethnocurriculum is a design framework that aligns educational objectives with the lived experiences and social values of the immediate community, rather than relying solely on abstract, state mandated standards. However, according to Suryani et al (2026) it is a curriculum approach that reconstructs pure science by contextualizing it's within the familiar cultural practices and ecological knowledge of a specific community.

Within Biology education, ethnocurriculum provide opportunities for linking scientific concepts with indigenous ecological knowledge, traditional medicinal practices, local biodiversity, conservation methods, and culturally embedded understanding of organisms (Mckinley & Smith, 2019). Such integration promotes culturally responsive teaching and enables learners to connect scientific knowledge with their everyday experiences. Indigenous knowledge in Biology is the local traditional understanding of plants, animals, and many ecosystems that communities build up over many generations. It includes traditional medicine, animal behaviour tracking, and sustainable farming methods (Rafiu et al 2025). According to Cheryl and Gregory (2020), indigenous knowledge is a body of observation, oral and written knowledge, innovations, practices, and beliefs developed by tribes and indigenous people through interaction and experience with environment. It is applied to phenomena across biological and other system and can be developed over millennia.

The implementation of ethnocurriculum in Biology teaching has been identified as a means of bridging the gap between scientific knowledge and indigenous ways of knowing (Battiste, 2013). Through the incorporation of local examples, community resources, and culturally relevant learning experiences, teachers can enhance students' understanding, engagement, and appreciation of Biology concepts. More so, ethnocurriculum contributes to the preservation and transmission of indigenous knowledge systems that are increasing threatened by modernization and globalization (UNESCO, 2021). The successful implementation of ethnocurriculum will depend on teachers' awareness, knowledge, and willingness to integrate indigenous perspectives into classroom instruction (Gay, 2018). Teachers who possess adequate awareness of ethnocurriculum are more likely to adopt culturally responsive teaching practices and utilize local examples and instructional materials while teaching. Conversely, limited awareness, inadequate teacher

training and professional development, lack of instructional materials and indigenous knowledge resources may hinder effective implementation and reduce opportunities for meaningful learning experiences (Mhakure & Otulaaja, 2024).

Popoola et al (2025) investigated the influence of indigenous practices on senior secondary Biology students' academic performance in Osun State, Nigeria. It was a survey research design involving 100 senior secondary learners. Data was collected using structured questionnaire and analysed using descriptive statistics and Pearson Product-Moment Correlation. The study found significant positive relationships between the integration of indigenous practices and learners' academic performance as well as self-concept. The authors concluded that indigenous knowledge enriches Biology learning and recommended its systematic integration into the Biology curriculum. The study supports the need for greater implementation of ethnocurriculum in Biology teaching. This present study is on Awareness and Implementation of Ethnocurriculum among Biology Teachers in Secondary School in Obio/Akpor Local Government area of Rivers State, Nigeria. Akachukwu and Okoye (2025) examined the effects of integrating ethno-biology and Indigenous knowledge systems into secondary school Biology instruction in South- East Nigeria. The researchers adopted a quasi-experimental pre-test, post-test, non- equivalent control group design involving secondary school learners. Data was analysed using Analysis of Covariance. The finding showed that learners taught through indigenous knowledge system-integration demonstrated significantly higher conceptual understanding, classroom engagement, and retention than those taught using conventional methods. The study recommended the formal integration of ethnocurriculum into the secondary school Biology curriculum and regular teacher training in indigenous knowledge system. Adam et al (2025) investigated the effectiveness of the culture-Techno-Contextual Approach in improving Biology learning among senior secondary school students in Lagos State, Nigeria. An explanatory sequential mixed-methods design was adopted with 121 students participating in the study. Data were collected using critical thinking test in nutrition and interview schedules. The findings indicated that integrating cultural experiences and local contexts into Biology teaching significantly improved students' critical thinking and classroom participation. The finding also reinforces the importance of ethnocurriculum in improving Biology instruction. This present study is on Awareness and Implementation of Ethnocurriculum among Biology Teachers in Secondary School in Obio/Akpor

Local Government area of Rivers State, Nigeria.

In Obio/Akpor Local Government Area of Rivers State, communities possess diverse indigenous knowledge related to environmental management, medicinal plants, agriculture, biodiversity conservation, and health practices. These knowledge systems represent valuable educational resources that can enrich Biology teaching and learning. However, there is limited empirical evidence regarding the extent to which Biology teachers in the area are aware of ethnocurriculum and the degree of which they implement it in classroom practice. Against this background, this study investigates the awareness and implementation of ethnocurriculum among Biology teachers in secondary schools in Obio/Akpor LGA of Rivers State.

1.1 Statement of Problem

The inculcation and integration of indigenous knowledge into formal education has gained increasing attention among educators, curriculum developers, and policymakers because of its potential to make learning more relevant, meaningful and culturally responsive. In Biology Education, ethnocurriculum provides opportunities for connecting scientific concepts with local knowledge, cultural practices, and community experiences. Such integration is expected to enhance students' understanding of Biological concepts, promote environmental awareness, and preserve valuable indigenous knowledge system. Despite this importance, the teaching of Biology in many secondary schools continues to be dominated by conventional instructional approaches that rely heavily on prescribed textbooks and standardized content. Consequently, locally available knowledge related to medicinal plants, biodiversity, conservation, environmental management, agriculture, and other biological practices is often underutilized during instruction. This situation may contribute to a disconnection between classroom learning and the realities of learners' immediate environment. The successful integration of ethnocurriculum depends largely on teachers who serve as the sole curriculum implementer. However, there are concerns that many Biology teachers may have limited awareness of ethnocurriculum and insufficient preparation for incorporating indigenous knowledge into their teaching practices. Even where awareness exists, some factors such as inadequate training, lack of instructional materials, limited institutional support, and curriculum constraints may hinder effective implementation.

In Obio/Akpor Local Government Area of Rivers State, communities possess rich indigenous knowledge that could serve as valuable resources for Biology teaching and learning. However, the extent to which Biology teachers are aware of ethnocurriculum and the degree to which they implement it in classroom practice are not properly documented. The absence of empirical evidence on this issue makes it difficult for educational stakeholders to design appropriate interventions aimed at promoting culturally relevant Biology education. Therefore, the problem of this study is to determine if Biology teachers in the study area are aware of ethnocurriculum and if the implement during Biology teaching in secondary schools and to identify the factors that may influence its effective integration into Biology instruction.

1.2 Objective of the study

The main purpose of this study was to investigate awareness and implementation of ethnocurriculum among Biology teachers in secondary schools in Obio/Akpor Local Government Area of Rivers State. Specifically, the study:

- Determine whether secondary school Biology teachers are aware of ethnocurriculum .
- Examine if Biology teachers implement ethnocurriculum in the teaching of Biology in secondary.
- Determine the perceived benefits of implementing ethnocurriculum in Biology teaching among secondary school teachers.
- Determine the challenges affecting the implementation of ethnocurriculum among Biology teachers in secondary schools.

3. Results

Research Question 1: Are secondary school Biology teachers aware of ethnocurriculum in Obio/Akpor Local Government Area of Rivers State?

Table 1: Mean Scores of respondents on the awareness of ethnocurriculum among Biology teachers in secondary schools in Obio/Akpor Local Government Area of Rivers State.

S/N	Question Item	Mean	Decision
1	I am familiar with the concept of ethnocurriculum.	3.2	Accepted
2	Most teachers understand the objective of ethnocurriculum in science education.	3.0	Accepted
3	Ethnocurriculum involves integrating indigenous knowledge into classroom instruction.	3.1	Accepted
4	I am aware of indigenous biological knowledge available within my community	3.2	Accepted
5	I understand how indigenous knowledge can support Biology teaching.	3.3	Accepted

1.3 Research questions

The following research questions were raised to guide the study

- Are secondary school Biology teachers aware of ethnocurriculum in Obio/Akpor Local Government Area of Rivers State?
- Do Biology teachers implement ethnocurriculum during teaching of Biology?
- What are the perceived benefits of implementing ethnocurriculum in Biology teaching?
- What challenges affect the implementation of ethnocurriculum among Biology teachers?

2. Research Methodology

This study adopted the descriptive survey research design. The population of the study is made up of all the Biology teachers in Obio/Akpor Local Government Area of Rivers State. A sample of 150 Biology teachers was selected through simple random sampling technique. Data was collected using the researcher structured questionnaire titled Awareness and Implementation of Ethnocurriculum among Biology Teachers (AIEBT). It consisted of 4 sections. Section A elicited information on biology teachers' awareness of ethno curriculum, section B elicited information of the implementation of ethnocurriculum, section C elicited information on the perceived benefit of ethnocurriculum while section D elicited information the challenges faced by Biology teacher in the implementation of ethnocurriculum in the teaching and learning. Each of these sections has five items structured on a 4 point modified Likert scale of strongly agree (SA) 4 points, Agreed (A) 3 points, Disagreed (D) 2 points and strongly disagreed (SD) 1 point. Research questions were answered using mean rating and any rating found to be below 2.50 was rejected.

The mean ratings of 3.2 for item one indicates that the respondents are familiar with the concept ethnocurriculum. Also, the rating of 3.0 for number two item shows that the respondents understand the objective of ethnocurriculum in science education. Similarly, the mean rating of 3.1 in item number three shows that respondents are aware that ethnocurriculum involve the integration of indigenous knowledge into Biology classroom instruction. In the same vein, the mean rating of 3.2 in item number four indicates that the respondents are aware of indigenous biological knowledge available within their community. Again the mean rating of 3.3 in item number five indicate that the respondents understand how indigenous knowledge can support Biology teaching in senior secondary school.

Research Question 2: Do Biology teachers implement ethnocurriculum during teaching of Biology?

Table 2: Mean score of respondents on Biology teachers implementation of ethnocurriculum during teaching of Biology

S/N	Question Item	Mean	Decision
6	Once in a while I incorporate indigenous biological knowledge into my Biology lessons.	3.0	Accepted
7	I use local examples to explain Biology concept sometimes.	3.2	Accepted
8	I discuss traditional uses of plants during Biology instruction e.g. Bryophylum.	3.3	Accepted
9	The biology curriculum does not adequately promote indigenous knowledge integration.	3.3	Accepted
10	Ethnocurriculum is relevant to secondary school Biology	3.1	Accepted

The mean rating of 3.1 for item number six indicates that the respondents accepted that they Incorporate indigenous biological knowledge into their Biology lessons. Also, the mean rating of 3.0 for item number seven shows that respondents accepted the fact that they use local examples to explain biology concept. Again, the mean rating of 3.3 in item eight indicates that respondents discuss traditional uses of plants during Biology instruction, similarly the mean rating of 3.3 for item nine indicates that the Biology curriculum does not adequately promote indigenous knowledge integration. In the same vein on item ten with a mean rating of 3.1 indicates that respondents' acceptance that ethnocurriculum is relevant to secondary school Biology.

Research Question 3: What are the perceived benefits of implementing ethnocurriculum in Biology teaching?

Table 3: Mean scores of respondents on the perceived benefits of implementing ethnocurriculum in Biology teaching.

S/N	Question Item	Mean	Decision
11	The integration of indigenous knowledge improves classroom participation in Biology teaching and learning.	3.2	Accepted
12	Ethnocurriculum promote respect for local culture and tradition.	3.0	Accepted
13	Learners understand better when local examples are used.	3.1	Accepted
14	Practical Biology lessons sometimes involve local materials and resources.	3.2	Accepted
15	Teachers relate Biology topics to local cultural practices.	3.2	Accepted

The mean rating of 3.2 for item eleven indicates that the respondents are of the opinion that integration of indigenous knowledge improves biology classroom participation. Also, the mean rating of 3.0 for question item twelve indicates the respondent acceptance of the fact that ethnocurriculum promote respect for local culture and tradition. In the same vein, by the mean rating of 3.2 for item number thirteen the respondents accepted that learners understand better when local examples are used. Similarly, the mean rating of 3.2 for items fourteen and fifteen respectively indicates that respondent agreed that practical biology lessons sometimes involve local materials and resources, and also relate Biology topics to cultural practice.

Research Question 4: What challenges affect the implementation of ethnocurriculum among Biology Teachers?

Table 4: Mean scores of respondents on challenges affecting the implementation of ethnocurriculum among Biology teachers.

S/N	Question Item	Mean	Decision
16	Many Biology teachers have received training on ethnocurriculum.	1.7	Rejected
17	The Biology curriculum adequately promotes indigenous knowledge integration.	1.9	Rejected
18	Lack of teaching materials promote the use of ethno curriculum in Biology	1.7	Rejected
19	Some teachers do not use community-based example to explain Biology concepts because it safes it time	1.9	Rejected
20	I have a lot of time to always use indigenous knowledge in Biology class.	1.8	Rejected

The mean rating of 1.7 for item sixteen indicates that the respondents rejected that many of them have received training on ethnocurriculum. Also, the mean rating of 1.9 for question item seventeen indicates that the respondents rejected that the Biology curriculum adequately promote indigenous knowledge integration. Similarly, the mean rating of 1.7 for item eighteen indicates that the respondents rejected that lack of teaching materials promotes the use of ethnocurriculum. In the same vein the mean rating of 1.7, for item nineteen, the respondents rejected some teacher does not use community-based examples to explain Biology concepts. Lastly on item number twenty with mean rating of 1.8, the respondents rejected that Biology have a lot of time to implement ethnocurriculum during biology lesson.

From the analysis of data presented above, the following major findings were made:

- Biology teachers in Obio/Akpor local government area are aware of ethnocurriculum in teaching and learning of Biology.
- Biology teachers implement ethnocurriculum in the teaching of Biology but this implementation is low.
- Biology teachers in Obio/Akpor local government are aware of the benefits of implementing ethnocurriculum in Biology teaching?
- There are challenges affecting the implementation of ethnocurriculum among Biology teachers.

4. Discussion

4.1 Awareness of ethnocurriculum among Biology teachers in secondary schools

The Biology teachers are aware of ethnocurriculum in teaching and learning of Biology because they are familiar with the concept of ethnocurriculum, most teachers understand the objective of ethnocurriculum in science education, they are aware that ethnocurriculum involves integrating indigenous knowledge into classroom instruction, teachers are aware of indigenous biological knowledge available within their community. And they understand how indigenous knowledge can support Biology teaching. This study is in line with Akachukwu and Okoye (2025) who noted that students taught through indigenous knowledge system-integrated instruction demonstrate significantly higher conceptual understanding, classroom engagement, and retention than those taught using conventional methods. This is

because Biology teachers are aware of ethno curriculum hence they are able to use it during teaching.

4.2 Teachers' implementation of ethnocurriculum in the teaching of Biology

The finding of this also revealed that Biology teachers implement ethnocurriculum in the teaching of Biology but this implementation is low because once in a while Biology teacher incorporate indigenous biological knowledge into Biology lessons, they use local examples to explain Biology concept, sometimes, they discuss traditional uses of plants during Biology instruction, Biology curriculum does not adequately promote indigenous knowledge integration, and ethnocurriculum is relevant to secondary school Biology. This result is in consonant with Adam et al (2025) whose findings indicated that integrating ethno curriculum into Biology teaching significantly improved students' critical thinking and classroom participation.

4.3 Perceived benefits of implementing ethnocurriculum in Biology teaching

The result of this study showed that Biology teachers in Obio/Akpor local government are aware of the benefits of implementing ethnocurriculum in Biology teaching because the integration of indigenous knowledge improves classroom participation in Biology teaching and learning, ethnocurriculum promote respect for local culture and tradition, learners understand better when local examples are used, practical biology lessons sometimes involve local materials and resources, teachers relate biology topics to local cultural practices. This result is in line with finding of Adam et al (2025) whose finding reinforces the importance of ethnocurriculum in improving Biology instruction. The result also corroborates with the study of Akachukwu and Okoye (2025) who noted that students taught through indigenous knowledge system-integrated instruction demonstrate significantly higher conceptual understanding, classroom engagement, and retention than those taught using conventional methods. This study is also in consonant with Popoola (2025) who noted significant positive relationships between the integration of indigenous practices and students' academic performance and also state that indigenous knowledge enriches Biology learning.

4.4 Challenges affecting the implementation of ethnocurriculum among Biology teachers in secondary schools

The result of this study showed that there are challenges affecting the implementation of ethnocurriculum among Biology teachers, many Biology teachers have not received any training on ethnocurriculum, the Biology curriculum does not adequately promote indigenous knowledge integration, lack of teaching materials, some teachers' inability to use community-based example in explaining biology concepts due to time constraints. This result is in line with the study of Mhakure & Otulaaja, (2024); Gay, G. (2018) who stated in their study that that Biology teachers often experience difficulty implementing ethnocurriculum because of extensive nature of the secondary school curriculum and the limited time allocated for classroom instruction.

5. Conclusion

This study examined the awareness and implementation of ethnocurriculum among Biology teachers in secondary schools. The findings revealed that Biology teachers possessed a moderate level of awareness of ethnocurriculum, indicating that while many teachers are familiar with the concept and recognize its relevance to Biology education, this awareness has not translated into effective classroom practice due to some challenges. The study further established that integrating of indigenous knowledge into Biology instruction remains limited in secondary school. This study also identified major barriers to the implementation of ethnocurriculum which includes time constraints, inadequate training on integrating indigenous knowledge into Biology instruction, and lack of instructional materials containing relevant local examples. These challenges restrict teachers' ability to incorporate culturally relevant teaching approaches that could enhance students' understanding of Biology concept and promote appreciation of indigenous knowledge systems.

Based on these finding, it is concluded that improving teachers' awareness alone is insufficient to ensure the successful implementation of ethnocurriculum. Effective implementation requires sustained professional development, adequate instructional resources, supportive curriculum policies, and institutional commitment. Addressing these challenges will strengthen the integration of ethnocurriculum into Biology teaching, improve the quality and relevance of Biology education, and contribute to the preservation and transmission of valuable indigenous knowledge for sustainable national development.

6. Recommendations

Based on the findings of this study, the following recommendations are made:

- School administrators should encourage Biology teachers to utilize locally available biological resources, indigenous examples and community experiences to enrich classroom instruction.
- Ministry of Education and educational agencies should organize regular workshops, seminars, and in-service training programmes to enhance Biology teachers' awareness and competence in implementing ethnocurriculum.
- Curriculum planners should incorporate indigenous biological knowledge and cultural practices into the secondary school Biology curriculum to make learning more relevant to learners' immediate. And they should also endeavour to enrich curriculum contents with ethno-Biology practices from different localities in subsequent curriculum review to help the learners appreciate and sustain their culture for future.
- Teacher education institute should include ethnocurriculum studies in their training programmes to prepare future teachers for culturally responsive teaching practices.
- Government and relevant educational stakeholders should develop and provide instructional materials, teachers' guide and resource manuals that support the effective implementation in of ethnocurriculum in Biology.
- Biology teachers should create opportunities for learners to share indigenous knowledge and experiences related to plant, and animals during classroom interaction.
- Educational authorities should organise regular workshops, seminars, and professional development programs to improve biology teachers' understanding of ethnocurriculum and its application in classroom instruction.
- Relevant educational stakeholders should develop and distribute instructional materials that integrate indigenous knowledge with conventional Biology concept.
- Universities, Colleges of Education and Teacher education institutions should include ethnocurriculum studies in their training programmes to prepare future teachers culturally responsive teaching practices.

- Biology teachers should be encouraged to adopt learners-centered instructional strategies, including field trips, project-based learning and community-based investigations, to promote the practical application of ethnocurriculum.

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