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Levels of Innovative Decolonization Process of Secondary School Mathematics Curriculum in Nigeria and South Africa

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Abstract: This study examines the extent of innovative decolonization process in secondary school mathematics curricula in Nigeria and South Africa. Using a comparative cross-national mixed-methods design, data were collected from 111 respondents, including mathematics teachers and curriculum policymakers, through stratified random and purposive sampling. A structured questionnaire on curriculum content, goals, materials, development processes, and teaching strategies was administered, with reliability established at 0.89. Descriptive and inferential analyses, including independent samples t-tests, were conducted at the 0.05 significance level. Findings reveal that both Nigeria (M = 2.62) and South Africa (M = 2.52) exhibit only moderate levels of curriculum decolonization, with limited integration of indigenous knowledge systems and culturally relevant pedagogy. While South Africa demonstrates more systemic policy efforts toward decolonization, implementation remains inconsistent due to resource and training gaps. Nigeria's curriculum continues to reflect Eurocentric orientations, with minimal evidence of indigenous mathematical practices. Overall, results highlight that both countries face challenges in embedding decolonial perspectives, particularly in teaching strategies and curriculum review processes. The study underscores the need for inclusive, culturally grounded curriculum reforms, enhanced teacher preparation, and participatory development processes to foster epistemic justice and learner engagement in mathematics education. Recommendations include strengthening policy frameworks, integrating ethnomathematics, and prioritizing teacher training to advance decolonial goals in African mathematics curricula.

Introduction

Background to the Study

The decolonization of the curriculum has become a central theme in educational reform across post-colonial societies, particularly in Africa. As nations continue to grapple with the remnants of colonial educational systems, there is a growing recognition of the need to transform school curricula to reflect indigenous knowledge systems, local realities, and socio-cultural experiences. Mathematics, often considered a culturally neutral subject, has not been exempted from this debate. Scholars argue that the current mathematics curriculum in many African countries remains largely Eurocentric, failing to incorporate African epistemologies, historical contributions to mathematics, and pedagogical practices rooted in local contexts (Nyabanyaba et al., 2022; Ndlovu, 2023).

In Nigeria and South Africa which are two of Africa's largest and most diverse nations, the call for curriculum decolonization has been especially prominent. In South Africa, student movements such as Fees Must Fall and Rhodes Must Fall brought international attention to the demand for transformation in education, particularly in revising curricula to be more inclusive of African perspectives (Le Grange, 2016; Ramrathan, 2023). This has led to national conversations and efforts to decolonize various subjects, including mathematics, by incorporating ethno-mathematical practices and culturally relevant pedagogy (Naidoo & Kapofu, 2023).

Nigeria, on the other hand, has experienced a slower and less coordinated approach to curriculum decolonization. While education policies acknowledge the need to make education more relevant to national development and cultural realities, the implementation of decolonized content, especially in mathematics, remains limited. Studies have shown that Nigerian mathematics curricula still largely mirror Western models, with minimal incorporation of indigenous content or contextual learning that connects mathematical concepts to the learners' cultural backgrounds (Okereke& Samuel, 2020; Ibrahim et al., 2022).

Mathematics as a discipline plays a vital role in technological development and scientific advancement, but its instruction and content delivery are not value-neutral. The way mathematics is taught and the examples used in textbooks often privilege Western knowledge systems while marginalizing African mathematical traditions, such as those evident in architecture, trade, measurement systems, and problem-solving methods in pre-colonial Africa (Gerdes, 2018; Mosimege, 2021). The marginalization of such knowledge not only perpetuates epistemic injustice but also contributes to learner alienation and disengagement.

Comparative analyses of decolonization efforts in mathematics curricula between countries like Nigeria and South Africa are vital in identifying best practices, barriers, and policy frameworks that can be adopted or avoided. South Africa's explicit and systemic approach to curriculum decolonization may offer valuable insights for Nigeria, which continues to struggle with the integration of indigenous knowledge systems into formal education (Maringe & Ojo, 2022). Conversely, Nigeria's emphasis on national unity and cultural pluralism presents unique opportunities for embedding diverse mathematical traditions from its over 250 ethnic groups into the curriculum, potentially enriching the discipline and making it more inclusive.

Recent research supports the idea that when learners see their cultural heritage reflected in the curriculum, they experience increased motivation, improved learning outcomes, and greater critical engagement with content (Mutekwe, 2023; Tella&Adediran, 2021). However, implementing a decolonized curriculum is not without challenges. Issues such as lack of teacher preparedness, inadequate resources, and resistance to change continue to hinder meaningful progress in both Nigeria and South Africa. Understanding the extent to which each country has progressed in decolonizing its secondary school mathematics curriculum—and the factors that have facilitated or obstructed this progress—is crucial to informing future reforms.

This study, therefore, seeks to conduct a comparative analysis of the levels of decolonization of the secondary school mathematics curricula in Nigeria and South Africa. By examining the curriculum content, goals and objectives, materials, and development and review processes, and teaching strategies, the research aims to highlight disparities, commonalities, and actionable strategies for fostering a truly African-centered mathematics education.

Research Questions

The research questions that guide this study are:

1. To what extent do the secondary school mathematics curriculum contents show innovative process of decolonization in Nigeria and South Africa?
2. What is the level of innovative decolonization process of secondary school mathematics curriculum goals and objectives in Nigeria and South Africa?
3. To what extent do secondary school mathematics curriculum materials show innovative process of decolonization in Nigeria and South Africa?

4. What is the level of decolonization innovative process of secondary school mathematics curriculum development and review processes in Nigeria and South Africa?
5. To what extent do teaching strategies of secondary school mathematics curriculum reflect innovative process of decolonization in Nigeria and South Africa?

Literature Review

Decolonization is a multifaceted process that involves dismantling the political, intellectual, cultural, and educational structures imposed by colonial powers. In the context of education, decolonization means interrogating and transforming curricula, knowledge systems, pedagogies, and institutional practices that have historically marginalized or erased indigenous and local knowledge. It is not merely about replacing Western content with indigenous knowledge, but about creating space for diverse epistemologies and validating local ways of knowing (Le Grange, 2016; Mbembe, 2019). In educational theory and practice, decolonization also requires the empowerment of historically oppressed communities to reclaim their narratives, identities, and intellectual sovereignty (Ndlovu-Gatsheni, 2020). It seeks to challenge and replace the dominance of Eurocentric paradigms with contextually relevant knowledge frameworks that reflect the lived realities and cultural histories of the people being educated.

Mathematics is commonly defined as the abstract science of number, quantity, structure, space, and change. It encompasses both theoretical and applied dimensions and serves as a foundational discipline across sciences, engineering, economics, and social sciences. Traditionally viewed as objective and universal, mathematics is often assumed to be culture-free. However, recent scholarship challenges this view by emphasizing that mathematical knowledge is also socially constructed, culturally situated, and historically embedded (Gerdes, 2018; Mosimege, 2021). Mathematics, as practiced and taught, can reflect cultural values, problem-solving approaches, and historical contributions from different civilizations, including African, Arab, Indian, and Chinese societies.

Curriculum refers to the totality of planned learning experiences provided by an educational institution. It includes the content taught, the pedagogy employed, the assessments used, and the learning environment established to support student development. According to contemporary educational theorists, the curriculum is not a neutral artifact but a cultural and political tool that shapes identity, knowledge, and power relations (Maringe&Ojo, 2022). The curriculum determines whose knowledge is considered legitimate, which values are transmitted, and how learners engage with their world. In

postcolonial contexts, the curriculum is often critiqued for perpetuating colonial legacies by prioritizing Western knowledge systems while marginalizing indigenous perspectives.

The mathematics curriculum refers specifically to the structured content and methods through which mathematical knowledge is transmitted in formal education. It encompasses the objectives, scope, sequencing of topics, teaching strategies, assessment methods, and educational resources used to teach mathematics at various levels of education. The mathematics curriculum is influenced by national education policies, cultural beliefs about mathematics, and the purposes assigned to mathematics education—whether utilitarian, theoretical, or developmental (Naidoo &Kapofu, 2023). In many African countries, including Nigeria and South Africa, the mathematics curriculum has historically been inherited from colonial education systems and often lacks contextual relevance to students' everyday lives (Nyabanyaba et al., 2022).

Decolonization of the mathematics curriculum refers to the critical rethinking and restructuring of mathematics education to dismantle colonial influences and integrate indigenous knowledge systems, local practices, and culturally relevant pedagogy. It challenges the notion of mathematics as a purely Western construct and advocates for recognizing and teaching mathematical practices embedded in African cultural activities such as architecture, games, trade, and navigation (Mosimege, 2021; Ndlovu, 2023). Decolonising the mathematics curriculum involves more than adding African content; it requires transforming the philosophical assumptions, pedagogical approaches, and epistemological foundations of how mathematics is conceived and taught (Mutekwe, 2023). This process not only empowers learners by affirming their cultural identities but also promotes cognitive justice by making mathematics more accessible, relatable, and meaningful to diverse learners.

Decolonial Theory provides a critical framework for understanding and assessing the extent to which colonial legacies persist in educational systems, particularly in curriculum design and knowledge production. Originating from the works of scholars such as Quijano (2000), Mignolo and Walsh (2018), and Ndlovu-Gatsheni (2020), the theory critiques the dominance of Western epistemologies in postcolonial societies and calls for the re-centering of indigenous, context-specific knowledge systems.

In the context of secondary school mathematics curricula in Nigeria and South Africa, Decolonial Theory challenges the assumption that mathematics is culturally neutral. Instead, it reveals how colonial and Eurocentric paradigms continue to shape mathematical content, pedagogy, and assessment practices. The theory emphasizes concepts such as the "coloniality of knowledge" and "epistemic disobedience," advocating for the integration of

ethnomathematics, local practices, and African mathematical contributions into mainstream curricula (Mosimege, 2021; Naidoo & Kapofu, 2023).

Applied to this comparative study, Decolonial Theory serves as a lens to evaluate how far each country has progressed in transforming its mathematics curriculum to reflect indigenous values and learners' lived realities. It supports a critique of inherited colonial structures and offers a pathway for epistemic justice through inclusive, culturally relevant mathematics education.

Recent empirical studies indicate that efforts to decolonize the secondary school mathematics curriculum in Nigeria and South Africa are ongoing but vary significantly in scope, intent, and implementation. In South Africa, several studies have documented deliberate national efforts to reform curriculum content by integrating ethnomathematics and promoting Afrocentric pedagogical approaches. For instance, Mosimege (2021) found that aspects of indigenous knowledge such as traditional patterns, measurement systems, and spatial reasoning have been introduced into some curricula and textbooks, particularly in response to post-apartheid education reforms and the #FeesMustFall movement. Naidoo and Kapofu (2023) further reported that while the curriculum policy framework increasingly supports decolonial aims, implementation at classroom level remains inconsistent due to limited teacher training and resource constraints.

Conversely, in Nigeria, empirical studies suggest that the mathematics curriculum remains largely Eurocentric. Okereke and Samuel (2020) analyzed curriculum documents and found minimal evidence of indigenous mathematical concepts or culturally relevant examples. Similarly, Ibrahim et al. (2022) conducted interviews with mathematics teachers across six Nigerian states and reported that most were unfamiliar with the concept of decolonizing mathematics or integrating local content, citing lack of training, policy direction, and teaching materials. Although national policy documents advocate for education relevant to local realities, curriculum practice remains detached from indigenous knowledge systems.

Overall, these findings suggest that South Africa has made more systemic progress toward curriculum decolonization in mathematics than Nigeria, although both countries face challenges related to teacher preparedness, resource availability, and epistemological orientation.

The goals and objectives of secondary school mathematics curricula in both Nigeria and South Africa remain largely influenced by Western educational paradigms, though South Africa shows more structured attempts at reform. In South Africa, Naidoo and Kapofu

(2023) analyzed curriculum policy documents and found that the post-apartheid mathematics curriculum incorporates decolonial intentions, including references to African contexts, social justice, and learner-centered pedagogy. However, these decolonial objectives are often broad and symbolic rather than explicitly operationalized in the mathematics curriculum, limiting their practical classroom impact.

Mosimege (2021) supports this view, noting that while curriculum reform in South Africa includes goals that mention contextual relevance and inclusivity, these are rarely translated into concrete, measurable outcomes. Interviews with curriculum developers and teachers revealed a mismatch between stated goals and actual classroom practices, partly due to inadequate teacher preparation in decolonial pedagogies.

In Nigeria, by contrast, the goals and objectives of the mathematics curriculum show limited evidence of decolonization. Ibrahim et al. (2022) found that curriculum objectives prioritize utility in global economic competitiveness, logical reasoning, and problem-solving goals derived from Western models with little attention to cultural identity or indigenous mathematical knowledge. Okereke and Samuel (2020) confirmed that curriculum goals in Nigeria remain abstract and culturally detached, with almost no references to local knowledge systems, values, or historical contributions to mathematics. These findings suggest that South Africa has taken initial steps toward embedding decolonial language in curriculum goals, whereas Nigeria's curriculum goals remain largely unchanged, reflecting a persistent colonial orientation.

Empirical evidence suggests that the decolonization of secondary school mathematics curriculum materials in both Nigeria and South Africa is still limited, with more structured progress seen in South Africa. In South Africa, studies have found a gradual integration of indigenous contexts and African cultural elements in mathematics textbooks and learning resources. Naidoo and Kapofu (2023) conducted a content analysis of selected textbooks and observed efforts to include culturally relevant examples such as African art patterns, local number systems, and everyday problem-solving contexts which reflect aspects of ethnomathematics. However, they also noted that many of these inclusions are superficial, sporadic, and not well integrated into the core mathematical concepts.

Mosimege (2021) echoed this concern, stating that although some mathematics materials in South Africa now feature localized content, most still adhere to Western pedagogical formats and content structures. The inclusion of indigenous knowledge is often tokenistic, and many teachers lack the training to effectively use culturally grounded materials in the classroom.

In Nigeria, the situation appears more static. Okereke and Samuel (2020) and Ibrahim et al. (2022) found that mathematics curriculum materials, including textbooks and teaching aids, remain largely imported or modeled after British curricula, with negligible integration of indigenous knowledge, languages, or cultural references. Their studies revealed that most mathematics textbooks used in Nigerian secondary schools focus on abstract Western content, offering little contextual relevance to learners' lived experiences or cultural backgrounds. Teachers also report relying heavily on outdated resources that do not support decolonial teaching approaches. South Africa has made modest strides toward decolonizing mathematics curriculum materials, while Nigeria continues to rely heavily on Western-oriented materials with minimal contextual adaptation.

The level of decolonization in the development and review processes of the secondary school mathematics curriculum remains limited in both Nigeria and South Africa, though South Africa shows comparatively greater responsiveness to decolonial imperatives. In South Africa, curriculum review processes since the post-apartheid era have included formal recognition of indigenous knowledge systems and cultural responsiveness. Naidoo and Kapofu (2023) found that national curriculum developers have made attempts to incorporate decolonial goals in policy documents and revision frameworks. However, their study also highlights a persistent gap between policy rhetoric and implementation, with limited consultation of local communities, traditional knowledge holders, and African mathematicians during the actual review processes.

Mosimege (2021) emphasized that while South African curriculum reforms acknowledge ethnomathematics and contextual relevance, these considerations are not consistently institutionalized in curriculum development procedures. Reviews tend to be top-down and dominated by academic experts rather than inclusive, participatory processes involving culturally diverse stakeholders.

In Nigeria, the situation is more static. Ibrahim et al. (2022) report that curriculum review processes are heavily centralized and primarily focused on aligning content with global economic and technological trends rather than cultural relevance. Okereke and Samuel (2020) found minimal evidence of decolonial considerations in recent curriculum development cycles. The involvement of indigenous education scholars, local communities, or ethnomathematical perspectives in mathematics curriculum review remains rare, reflecting a continued reliance on Western frameworks and a lack of political will to indigenize the process. In sum, while South Africa demonstrates partial integration of decolonial aims in curriculum development and review, Nigeria's processes remain largely detached from decolonial discourse, with both countries needing more inclusive, culturally rooted approaches.

The decolonization of teaching strategies in the secondary school mathematics curriculum is still in its early stages in both Nigeria and South Africa, though South Africa exhibits more structured efforts. In South Africa, Mosimege (2021) and Naidoo and Kapofu (2023) report that some teachers have begun integrating ethnomathematics and culturally responsive pedagogy into their classroom practices. This includes using local games, patterns, and real-life contexts to explain mathematical concepts. However, these strategies are not widespread, largely due to limited professional development and lack of institutional support.

In **Nigeria**, empirical findings suggest that teaching strategies remain largely traditional and Western-oriented, focusing on rote learning and abstract concepts disconnected from learners' cultural realities. Ibrahim et al. (2022) observed that most Nigerian mathematics teachers are unfamiliar with decolonial approaches and lack the training to apply culturally relevant methods. As a result, indigenous mathematical practices and learner-centered approaches are rarely used, and the teaching strategies continue to reflect colonial instructional models.South Africa has taken modest steps toward decolonizing mathematics teaching strategies, while Nigeria continues to rely heavily on conventional, non-contextualized methods, highlighting a significant gap in decolonial pedagogical practice in both nations.

Research Design

This study adopts a comparative cross-national research design within a mixed-methods framework. The design integrates quantitative and qualitative approaches to provide a comprehensive assessment of the level of decolonization of the secondary school mathematics curriculum in Nigeria and South Africa. The quantitative component enables the measurement of the extent and level of decolonization across defined curriculum dimensions (content, goals, materials, processes, and teaching strategies). The qualitative component allows for deeper exploration of curriculum documents, policy frameworks, and stakeholder perspectives to uncover underlying epistemological orientations and contextual realities. The comparative design is appropriate because it facilitates systematic examination of similarities and differences between two post-colonial African nations with distinct educational reform trajectories. The design is non-experimental, descriptive, and analytical in nature.

Population, Sample and Sampling Techniques

The population of the study consists of 1. All secondary school mathematics teachers in public secondary schools in Nigeria and South Africa. 2. Curriculum developers and policymakers involved in mathematics curriculum design and review in both countries. 3.

For Nigeria, the population includes mathematics teachers under the Federal and State Ministries of Education and, for South Africa, the population includes teachers implementing the national mathematics curriculum under the Department of Basic Education. A multi-stage sampling technique was employed. Stage 1: Selection of States/Province; Federal Capital Territory, Abuja was purposively selected, being the Federal Capital that houses all the all the policy making government offices, and in South Africa, Johannesburg was also purposively selected for the same reason. Stage two involved selection of schools. Stratified random sampling was used to select public secondary schools (urban and rural strata). Stage 3 involved selection of teachers. Simple random sampling was used to select mathematics teachers within selected schools. The last stage involved purposive selection of curriculum experts and policymakers who had one time or the other been classroom teachers before being moved to policy making offices. These policy makers who also have teaching experience are deemed suitable to answer the aspect of the items involving teaching strategies. In all, a total of 57 respondents were selected from Nigeria comprising 42 mathematics teachers and 15 policy makers and, a total of 54 respondents from South Africa comprising 43 mathematics teachers and 11 policy makers. The samples selected was arrived at using Cochran's formula to ensure the samples' representativeness of the population.

Data Collection and Analysis

Data was collected by questionnaires titled 'Questionnaire on the Level of Decolonization of Mathematics Curriculum' (QLDMC). The questionnaire was divided into five sections namely 1. Curriculum Content 2. Curriculum Goals and Objectives 3. Curriculum Materials 4. Curriculum Development and Review and 5. Teaching Strategies. The questionnaire was structured using a Likert-scale format with four response options; 1. Strongly Disagree 2. Disagree 3 Agree and 4. Strongly Agree. The instrument was subjected to review by experts in Mathematics Education at the Mathematical Sciences Education Programme (MSEP) arm of National Mathematical Centre, Abuja, and experts from Curriculum Studies at the Nigeria Educational and Research Development Council (NERDC) to ensure its face and content validity. The instrument was also subjected to pilot testing to determine its internal consistency. It was administered to 20 Mathematics Teachers and 10 curriculum experts; the results of the questionnaires were split into half and Spearman Brownman's formula was used to determine the reliability coefficient of the odd half. The reliability coefficient gotten was 0.89 which was considered as suitable.

The instrument was administered to the selected samples and the data obtained was analyzed using independent sample *t*-test at 0.05 level of significance to answer all the research questions. Since the Likert-scale format adopted was four, a threshold mean of 2.5

was set as being positive responses. The mean responses of the respondents were then compared to answer the research questions.

Results and Findings

1. **Research Question 1:** To what extent do the secondary school mathematics curriculum contents show innovative process of decolonization in Nigeria and South Africa?

Table 1: Extent of Innovative Process of Decolonization of Mathematics Curriculums

Country of Respondents		**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
The mathematics curriculum includes concepts and examples from non-western traditions i.e. African and Indigenous system	Nigeria	57	2.70	.925	.123
	South Africa	54	2.72	.878	.119
local and indigenous knowledge are recognized as valid forms of mathematical understanding	Nigeria	57	2.72	.774	.102
	South Africa	54	2.76	1.027	.140
The curriculum integrates culturally relevant mathematical applications that reflects students' real-world context	Nigeria	57	2.74	.745	.099
	South Africa	54	2.44	.861	.117
Mathematical history in the curriculum covers contributions from diverse global civilization	Nigeria	57	2.56	.780	.103
	South Africa	54	2.41	.901	.123
The curriculum challenges the idea that western mathematics is the only authoritative knowledge system	Nigeria	57	2.37	.698	.092
	South Africa	54	2.26	1.031	.140
Ground Mean	**Nigeria**		**2.62**	**.784**	**.104**
	South Africa		**2.52**	**0.94**	**0.128**

From Table 1, the grand mean scores of Nigeria and South Africa are 2.62 and 2.52 respectively, both scored being above the benchmark of 2.5, indicating moderate innovation in decolonization of content. Nigeria scored 2.70 on inclusion of non-Western concepts, while South Africa scored 2.72, showing some effort to integrate indigenous knowledge. However, innovation is weak in challenging Western dominance (Nigeria =

2.37, South Africa = 2.26). : Curriculum content reflects moderate innovation, with Nigeria slightly stronger in contextual applications, but both countries remain weak in questioning Eurocentric authority.

Research Question 2: What is the level of innovative decolonization process of secondary school mathematics curriculum goals and objectives in Nigeria and South Africa?

Table 2: Level of innovative decolonization process of secondary school mathematics curriculum goals and objectives

Country of Respondents		**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
The curriculum challenges the idea that western mathematics is the only authoritative knowledge system	Nigeria	57	2.37	.698	.092
	South Africa	54	2.26	1.031	.140
The curriculum aims to promote critical thinking about the cultural and historical origin of mathematical concepts	Nigeria	57	2.74	.745	.099
	South Africa	54	2.61	.712	.097
One of the goals of the curriculum is to empower students from historical marginalized communities	Nigeria	57	2.44	.627	.083
	South Africa	54	2.59	.942	.128
Ground Mean	**Nigeria**		2.52	.690	.091
	South Africa		2.49	0.586	0.122

Nigeria scored 2.74 on promoting critical thinking about cultural origins, above the benchmark, while South Africa scored 2.26 on challenging Western dominance, below the benchmark. This suggests Nigeria shows some innovative recognition of cultural relevance, but both countries fall short of operationalizing decolonial goals. Goals and objectives show moderate innovation, with Nigeria stronger in promoting cultural reflection, while South Africa emphasizes empowerment. However, both countries lack robust operationalization of these goals into classroom practice.

Research Question 3: To what extent do secondary school mathematics curriculum materials show innovative process of decolonization in Nigeria and South Africa?

Table 3: The extent of innovative process of decolonization of secondary school mathematics curriculum materials in Nigeria and South Africa.

Country of Respondents		N	Mean	Std. Deviation	Std. Error Mean
Examples used in the curriculum reflect daily lives and local environments of the learners	Nigeria	57	2.93	.593	.079
	South Africa	54	2.52	.746	.101
Visual problems and case studies used in instructional materials are inclusive of multiple cultural perspectives	Nigeria	57	2.81	.667	.088
	South Africa	54	2.54	.840	.114
Ground Mean	**Nigeria**		**2.87**	**0.63**	**0.084**
	South Africa		**2.53**	**0.793**	**0.108**

South Africa's materials show modest innovation, with localized examples (African art, number systems) scoring slightly above 2.5. Nigeria's materials remain Eurocentric, with most scores below or at the benchmark, confirming showing little or no motivation with localized examples. Nigeria demonstrates stronger innovation in curriculum materials, integrating local contexts more effectively than South Africa. However, both countries remain moderate, with inclusions often superficial and not deeply embedded in core mathematical concepts.

Research Question 4: What is the level of decolonization innovative process of secondary school mathematics curriculum development and review processes in Nigeria and South Africa?

Table 4: Level of decolonization innovative process of secondary school mathematics curriculum development and review processes in Nigeria and South Africa.

Country of Respondents		N	Mean	Std. Deviation	Std. Error Mean
The curriculum was developed with inputs from local communities and indigenous knowledge holders	Nigeria	**57**	**2.61**	**.881**	**.117**
	South Africa	**54**	**2.33**	**.991**	**.135**
	Nigeria	**57**	**2.74**	**.669**	**.089**

There is a formal process of reviewing the curriculum to identify and remove colonial biases	South Africa	**54**	**2.70**	**.882**	**.120**
Ground Mean	Nigeria		2.68	.775	.103
	South Africa		2.52	0.937	.128

On curriculum review processes, the table showed the mean scores of responses to the item on curriculum being developed with inputs from local communities and indigenous knowledge holders to be 2.61 and 2.33 respectively for Nigeria and South Africa. This suggests that both countries acknowledge indigenous knowledge but the processes remain top-down and expert-driven. Nigeria's processes show little evidence of indigenous participation or decolonial considerations unlike the South Africa's processes that looks below expectation. Nigeria shows slightly stronger innovation in curriculum review, with more evidence of community input, while South Africa demonstrates policy-level recognition but remains more centralized. Both countries still lack fully participatory and inclusive review processes.

Research Question 5: To what extent do teaching strategies of secondary school mathematics curriculum reflect innovative process of decolonization in Nigeria and South Africa?

Table 5: Extent of teaching strategies of secondary school mathematics curriculum innovation decolonization process in Nigeria and South Africa.

Country of Respondents		N	Mean	Std. Deviation	Std. Error Mean
Teachers are encouraged to adapt the curriculum to reflect local content, culture and knowledge	Nigeria	57	2.98	.954	.126
	South Africa	54	2.85	.998	.136
The curriculum acknowledges that mathematics is a human construct developed across cultures and time	Nigeria	57	2.81	.667	.088
	South Africa	54	3.02	.765	.104
I integrate local cultural practices when teaching mathematics concepts	Nigeria	57	3.11	.489	.065
	South Africa	54	3.07	.773	.105
	Nigeria	57	3.18	1.071	.142

My teaching methods encourages students to bring indigenous mathematical ideas	South Africa	54	2.94	.834	.113
I adapt instructional materials to reflect local realities and experiences	Nigeria	57	3.16	.649	.086
	South Africa	54	2.78	1.022	.139
I encourage the use of local languages to explain mathematics ideas where appropriate	Nigeria	57	3.18	.805	.107
	South Africa	54	2.94	.834	.113
My teaching methods discourage western and British instructional ideas	Nigeria	57	1.98	1.126	.149
	South Africa	54	1.93	1.179	.160
Ground Mean	Nigeria		2.91	0.823	0.109
	South Africa		2.79	0.915	0.124

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South Africa shows modest innovation, with some teachers integrating ethnomathematics (scores slightly above 2.5). Nigeria's teaching strategies scored consistently above the benchmark, suggesting a great level of innovation in the decolonization process of teaching strategies. Nigeria is stronger in integrating local practices and languages, while South Africa emphasizes cultural recognition of mathematics. Both countries, however, remain dependent on Western instructional models.

Summary of Findings

1. Both Nigeria and South Africa demonstrate moderate innovation in decolonization processes, with scores slightly above the benchmark.
2. Nigeria shows stronger innovation in curriculum materials and teaching strategies, integrating local contexts and languages more effectively.
3. South Africa demonstrates stronger systemic policy innovation and recognition of mathematics as a cultural construct, but classroom implementation lags.
4. The weakest innovation areas across both countries are challenging Western dominance and curriculum review processes, confirming that decolonization remains symbolic rather than transformative

Discussion

The findings reveal that innovation in decolonization processes is uneven across Nigeria and South Africa. Both countries scored just above the benchmark, indicating moderate progress, but innovation remains limited to symbolic gestures rather than systemic transformation.

South Africa's relatively higher innovation in policy frameworks likely reflects the influence of post-apartheid reforms and student movements such as Fees Must Fall (Le Grange, 2016; Ramrathan, 2023). Yet, as Naidoo & Kapofu (2023) argue, these policies often fail to translate into classroom practice due to inadequate teacher training and resources. Nigeria's curriculum, by contrast, remains more static, reflecting colonial legacies with minimal indigenous integration (Okereke & Samuel, 2020).

The innovative decolonization process is visible in curriculum content and goals, where both countries scored above 2.5. However, innovation is highest in teaching strategies and review processes, confirming Ndlovu-Gatsheni (2020) that decolonization requires epistemic disobedience and participatory approaches, not just policy rhetoric.

Comparatively, South Africa demonstrates more systemic innovation but struggles with implementation, while Nigeria shows isolated signs of innovation in goals but lacks structural support. This supports Mutekwe (2023), who emphasized that innovation in decolonization must empower learners by affirming cultural identities and promoting cognitive justice.

Conclusion

This study concluded that the innovative decolonization process in the secondary school mathematics curricula of Nigeria and South Africa remains at a moderate level, with both countries scoring slightly above the benchmark. Nigeria demonstrates stronger innovation in curriculum materials and teaching strategies, particularly through the integration of local contexts and languages, while South Africa reflects more systemic policy-level innovation and recognition of mathematics as a cultural construct.

Despite these advances, both countries remain weak in challenging Western dominance and in ensuring participatory curriculum review processes, confirming that decolonization efforts are still largely symbolic rather than transformative. The findings highlight that true innovation requires structural change—embedding ethnomathematics, fostering culturally responsive pedagogy, and involving communities in curriculum design.

In conclusion, Nigeria and South Africa are progressing toward decolonization but remain at a transitional stage. Sustained commitment to epistemic justice, cultural relevance, and inclusive curriculum reform is essential if mathematics education is to become a tool for empowerment and cognitive justice across African societies.

Limitation of the Study

Below are the identified limitations of the Study:

1. This work focused only on Abuja and Johannesburg, limiting rural perspectives.
2. The data used, being responses to questionnaire items may may introduce bias.
3. The work was cross-sectional design that may prevent the tracking innovation over time.
4. The sample size, though representative, was relatively small.

Suggestions for Further Studies

The following are suggested for further studies:

a. Longitudinal studies may be carried out to track innovation in decolonization over time.
b. Expanded research to rural and diverse regions.
c. Case studies of innovative ethnomathematics integration.
d. Comparative studies with other African countries.
e. Research on student outcomes under innovative decolonial curricula.

Recommendations

Based on the findings, the following recommendations are provided:

1. Policy Innovation: Embed explicit decolonial objectives that prioritize indigenous knowledge and ethnomathematics.
2. Teacher Innovation: Governments of the two countries are encouraged to train teachers in innovative, culturally responsive pedagogy.
3. Material Innovation: Stakeholders in teaching and curriculum development are encouraged to develop textbooks that authentically integrate African traditions, avoiding tokenism.
4. Process Innovation: Adopt participatory curriculum review involving communities and indigenous scholars.
5. Resource Innovation: Governments of the two countries are also encouraged to allocate funding to support innovative teaching strategies and materials.

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