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INDIGENISING MATHEMATICS SCHOLARSHIP: A PATHWAY TO SUSTAINABLE DEVELOPMENT IN NIGERIAN HIGHER EDUCATION

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Abstract

This study investigates the current landscape of mathematics research in selected universities in Ogun State, Nigeria, through the lens of decolonisation. It emphasises cultural relevance, the integration of indigenous knowledge systems, and responsiveness to local socio-economic challenges. Anchored in Postcolonial Theory, the research critiques the prevailing dominance of Eurocentric paradigms in mathematics scholarship, which often marginalise local epistemologies and fail to address community-specific needs. Using an explanatory sequential mixed-methods design, the study analysed 45 research outputs from three institutions over the past decade. Quantitative findings revealed a strong emphasis on Pure and Applied Mathematics, with minimal attention to Mathematics Education, limited engagement with local problem-solving, and no explicit incorporation of decolonial principles. Thematic analysis of qualitative data exposed systemic gaps, including weak alignment between research agendas and community priorities, limited use of culturally responsive methodologies, and the absence of institutional policies promoting indigenous knowledge integration. The study proposes strategic interventions: targeted funding for locally relevant research, partnerships with industry and communities, curriculum reforms embedding indigenous perspectives, capacity building in decolonial research practices, and institutional frameworks for monitoring progress. These recommendations aim to reposition mathematics research towards greater societal relevance, epistemic inclusivity, and sustainable development. By foregrounding local contexts and knowledge systems, this research contributes to the global discourse on decolonising education. It offers a practical roadmap for transforming mathematics scholarship in Nigerian universities into a more equitable, contextually grounded, and development-oriented endeavour.

Keywords: Decolonisation, Mathematics Research, Indigenous Knowledge, Postcolonial Theory, Culturally Responsive Pedagogy, Higher Education, Nigeria

1. Introduction

Mathematics, as both a discipline and a field of inquiry, has historically been defined and structured through Western epistemological traditions. Onoshakpokaiye (2021) defines mathematics as a scientific discipline concerned with numbers, quantities, structures, spaces, and problem-solving processes. While this definition captures the scientific and analytical scope of mathematics, it fails to acknowledge the cultural and contextual dimensions through which mathematical understanding and practice are developed. In many African societies, including Nigeria, mathematical reasoning has long been embedded in cultural artefacts, social organisation, trade, architecture, and indigenous technologies. However, these knowledge systems have often been marginalised in formal education and academic research. In Nigeria, the teaching and study of mathematics continue to reflect Western-oriented epistemic frameworks that emerged during and after the colonial period (Mosimege, 2017; Osibodu, 2022). The dominance of these frameworks stems from the colonial imposition of education systems that privileged Western knowledge while devaluing local ways of knowing. Maldonado-Torres (2007) and Koopman et al. (2025) explain that coloniality persists not merely as a historical condition but as a continuing structure that shapes academic thought, institutional practices, and what is considered legitimate knowledge. Consequently, mathematics curricula and research in many Nigerian universities remain heavily

influenced by Eurocentric standards that do not always reflect the realities, values, and experiences of local communities.

This epistemic imbalance has several implications for mathematics education and research. Scholars such as Gutstein et al. (2005) and Lerman (2019) argue that mathematics often appears abstract, alien, and disconnected from learners' daily lives. The resulting detachment contributes to limited learner engagement, reduced problem-solving capacity, and a narrow understanding of mathematics as a purely theoretical pursuit rather than a practical and culturally embedded discipline. When learners fail to recognise the relevance of mathematics to their socio-economic and cultural contexts, its transformative potential as a tool for innovation and local development is diminished. Recent scholarship in African mathematics education has begun to interrogate these limitations. Osibodu (2024) observes that efforts to integrate non-Eurocentric perspectives, such as mathematics for social justice, culturally sustaining pedagogy, and indigenous mathematical knowledge, have gained momentum, yet remain peripheral within mainstream research and policy. This marginalisation reflects broader global trends where decolonial initiatives are often viewed as supplementary rather than foundational to the discipline. The movement to decolonise education, however, calls for a more profound transformation of epistemological structures. It challenges educators and researchers to re-centre local realities, indigenous philosophies, and communal modes of knowledge production within curriculum design, pedagogical practice, and scholarly research (Burgess et al., 2022; Guberina, 2023).

Within mathematics specifically, decolonisation requires moving beyond the assumption of universality that underpins Western mathematical traditions. It involves recognising that mathematical knowledge is not value-free but culturally situated. Muraina (2022) contends that decolonising mathematics in Africa should entail reinterpreting the discipline through indigenous worldviews, aligning it with social realities, and ensuring that it serves local developmental priorities. This shift calls for the incorporation of community-based problem-solving, traditional knowledge systems, and languages that reflect learners' lived experiences. Moreover, Osibodu (2024) cautions that decolonisation must not be reduced to superficial curricular reform; it requires a sustained critique of the deeper coloniality that influences epistemology, ontology, and institutional governance in higher education.

In this context, Nigerian universities play a critical role as sites of knowledge production and transformation. Universities in Ogun State, like many others across the country, are tasked with advancing mathematics research that not only contributes to global scholarly discourse but also addresses local challenges and fosters social relevance. However, questions remain about whether existing research practices and outputs in mathematics genuinely reflect decolonisation principles or continue to replicate Eurocentric paradigms. This study, therefore, examines the state of mathematics research in Nigerian universities, with a specific focus on three institutions in Ogun State. It critically analyses how mathematics research aligns with the principles of decolonisation by assessing the extent to which indigenous knowledge systems, local challenges, and cultural contexts are integrated into academic work. In doing so, the study seeks to illuminate the relationship between research practices and epistemic justice, contributing to broader debates on decolonising higher education in Africa (Shahjahan et al., 2022; Widayat et al., 2025).

The significance of this research lies in its potential to bridge the gap between global academic standards and local intellectual traditions. By mapping current trends in mathematics research, the study highlights areas where decolonisation efforts are emerging and identifies gaps that hinder inclusive, contextually grounded scholarship. The findings aim to inform institutional policy, curriculum design, and research strategy, ultimately fostering a more equitable and culturally relevant framework for mathematics research in Nigeria.

Accordingly, this study is guided by the following research questions:

1. What is the current focus of mathematics research in universities in Ogun State, and how culturally relevant is it?
2. To what extent does mathematics research in Ogun State universities incorporate indigenous knowledge and practices?
3. How inclusive is mathematics research in addressing the diverse needs of local communities?
4. What is the overall alignment of mathematics research outputs with decolonisation principles?
5. What strategies can be implemented to strengthen the decolonisation of mathematics research in Ogun State universities?

By addressing these questions, the study aims to contribute to the re-imagining of mathematics research as a vehicle for epistemic transformation, cultural affirmation, and sustainable national development within the broader African higher education landscape.

Literature review

Theoretical Framework: Postcolonial Theory

This study is anchored in Postcolonial Theory, which provides a critical lens for examining how the legacies of colonialism continue to shape systems of knowledge, identity, and institutional practice. Postcolonial theorists such as Edward Said (1978), Gayatri Spivak (1988), and Homi Bhabha (1994) argue that colonialism extended beyond political domination to encompass epistemological control. Through this process, Western knowledge systems were elevated as universal and superior, while indigenous epistemologies were marginalised or erased.

In the field of education, postcolonial theory exposes how the curriculum, pedagogy, and assessment frameworks remain embedded within Eurocentric traditions that prioritise Western ways of knowing. These legacies manifest in the continued dominance of English as the medium of instruction, the marginalisation of African intellectual traditions, and the perception that Western scientific rationality is neutral or objective. Postcolonial scholars call for the reclaiming and revaluation of indigenous and local knowledge as a means of achieving epistemic justice (Santos, 2014; Ajani & Luthuli, 2025). Within the context of mathematics education, postcolonial theory enables an interrogation of how Nigerian universities may inadvertently reproduce Eurocentric paradigms through their research agendas, curriculum design, and publication practices. It invites reflection on key questions such as: whose knowledge is considered legitimate, how it is produced and validated, and what socio-political purposes it serves. By applying this theoretical framework, the study critically explores both the structural and epistemological dimensions of mathematics research in Nigeria, revealing how institutional norms and colonial epistemes intersect to sustain unequal knowledge hierarchies.

Decolonising Mathematics Education

Mathematics has long been perceived as a universal and culturally neutral discipline, a view that recent scholarship increasingly challenges. Scholars such as Kilpatrick, Hoyles, and Skovsmose (2019) assert that mathematics is not detached from culture but is deeply influenced by the social, linguistic, and historical contexts in which it is taught and learned. The dominance of Western pedagogical traditions has led to the exclusion of African mathematical knowledge systems from the classroom, thus reinforcing a monocultural conception of the discipline.

Decolonising mathematics education, therefore, requires the deliberate disruption of these assumptions of universality and neutrality. It involves recognising that mathematical knowledge is culturally situated and that African societies have long histories of mathematical reasoning embedded in daily life. Zaslavsky (1999) documents how mathematical concepts are reflected in African cultural artefacts, architecture, craftwork, trade, and symbolic systems. However, these indigenous contributions are often excluded from formal mathematics curricula, reinforcing the perception that legitimate mathematics originates only from the West. Language is a crucial element of this decolonisation process. Naidoo (2021) observes that the reliance on English as the sole language of mathematics instruction in Nigeria creates barriers to comprehension, alienating learners from the subject. Incorporating indigenous languages in mathematics teaching enhances understanding, contextual engagement, and learner confidence. Hence, decolonising mathematics is not merely a curricular reform; it is a transformative epistemological project that re-situates mathematics within learners' lived experiences and restores its cultural meaning.

Indigenous Knowledge Systems and Mathematics

Indigenous knowledge systems constitute the cumulative wisdom and practices that communities have developed over generations to interpret and navigate their natural and social environments. Within mathematics, these systems encompass diverse forms of counting, measurement, pattern recognition, spatial reasoning, and problem-solving that are expressed through everyday practices such as farming, construction, textile design, and trading (Kadonsi et al., 2023). Gerdes (1999) demonstrates that geometric principles can be observed in African artefacts and design patterns, which can serve as valuable pedagogical tools for teaching modern mathematical concepts. Similarly, Setati and Adler (2001) illustrate how mathematical ideas embedded in African languages such as Sesotho can enrich formal mathematical instruction and stimulate culturally responsive teaching.

Integrating indigenous mathematical knowledge into research and pedagogy, therefore, promotes relevance and accessibility. Venketsamy (2024) argues that contextualising mathematics within learners' cultural frameworks not only improves engagement but also affirms identity and belonging. Zidny et al. (2020) add that this integration bridges the gap between academic theory and lived experience, producing mathematics that is both intellectually rigorous and socially meaningful. Such an approach aligns with the broader decolonial project, which seeks to democratise knowledge and ensure that African epistemologies are recognised as legitimate foundations for scientific and mathematical thought.

Cultural Relevance and Inclusivity

The concept of cultural relevance emphasises the inclusion of learners' social and cultural backgrounds in curriculum design, pedagogy, and research. Abdulrahim and Orosco (2020) assert that culturally relevant teaching makes learning more meaningful by connecting mathematical ideas to real-world experiences familiar to students. When mathematics reflects learners' environments, languages, and practices, it enhances conceptual understanding, strengthens motivation, and cultivates a sense of ownership over knowledge. Inclusivity extends the notion of cultural relevance by ensuring that education accommodates the needs of all learners, including those from historically marginalised groups such as rural students, girls, and learners with disabilities. Pera (2015) highlights that inclusive mathematics research must engage with questions of access, equity, and representation. This requires moving beyond abstract theorisation to address concrete issues such as local economic planning, agricultural modelling, and resource distribution.

Graham (2020) reinforces this argument by urging mathematics researchers to challenge the assumption of Western universality and instead to generate knowledge that is both globally recognised and locally meaningful. The integration of cultural relevance and inclusivity in mathematics research not only enriches academic inquiry but also contributes to social transformation by ensuring that research outcomes address the real needs of diverse communities.

Mathematics Research in Nigerian Universities: Current State

In Nigeria, mathematics research remains predominantly aligned with theoretical and Eurocentric traditions, reflecting broader postcolonial patterns in African higher education. Universities often prioritise research in pure mathematics, computational modelling, and abstract theoretical work, with relatively limited engagement in applied or community-based research. While such research upholds academic rigour, it frequently lacks direct relevance to local socio-economic development (Olawale, 2025).

In Ogun State, this pattern is particularly evident. Although some universities have begun to explore mathematics education and applied research, few have incorporated indigenous knowledge or decolonial perspectives into their outputs. This limited scope reflects institutional inertia, where research evaluation systems and funding mechanisms continue to reward alignment with Western academic norms rather than local problem-solving. As a result, mathematics research often remains disconnected from community realities and national development priorities. Existing studies in Nigerian mathematics education have primarily focused on teaching strategies, curriculum design, and learner performance (Ajani & Rathilal, 2025). However, there remains a notable gap in the literature regarding the decolonisation of mathematics research itself—that is, how research agendas, methodologies, and epistemologies can be reoriented toward African contexts. This study seeks to address that gap by examining the extent to which mathematics research in Ogun State universities reflects principles of decolonisation, cultural relevance, and epistemic justice.

The reviewed literature establishes a compelling rationale for this study. Postcolonial theory provides a powerful lens for interrogating how colonial legacies shape mathematical knowledge production, while emerging scholarship on decolonisation and indigenous knowledge underscores the potential for transformation through local relevance and inclusivity. However, evidence from Nigerian universities reveals persistent Eurocentric dominance and limited integration of African epistemologies. This underscores the urgency of examining institutional practices, research outputs, and epistemic orientations in order to advance mathematics research that is socially grounded, culturally meaningful, and globally relevant.

2. Method

This study employed a descriptive mixed-methods design, integrating quantitative and qualitative approaches to achieve both breadth and depth in the analysis of mathematics research outputs. The mixed-methods strategy enabled a holistic understanding of how mathematics research conducted within Ogun State universities aligns with, or diverges from, decolonisation principles and practices. *Research Design*

A descriptive research design was adopted to allow for a systematic, empirical examination of existing mathematics research outputs, capturing prevailing trends, focus areas, and thematic orientations. The study utilised an explanatory sequential mixed-methods approach (Creswell & Plano Clark, 2018), which involves two distinct but complementary phases. In the first phase, quantitative analysis was conducted to provide a broad overview of the research landscape. This involved categorising and quantifying outputs based on focus areas—such as pure mathematics, applied mathematics, mathematical modelling, and mathematics education—and assessing the extent to which these works addressed decolonial themes such as inclusivity, indigenous knowledge, and cultural contextualisation. In the second phase, qualitative analysis was employed to deepen understanding of the patterns revealed in the quantitative phase. This entailed a close reading and interpretive analysis of

selected outputs, guided by thematic analysis (Braun & Clarke, 2006), to uncover how cultural, linguistic, and socio-political factors influence research practices in mathematics. The qualitative phase provided nuanced insights into the underlying epistemological orientations shaping mathematics research in the selected universities. This design was particularly suited to the study's aim of bridging empirical description with critical interpretation, thereby illuminating not only what patterns exist but also how and why they persist within the broader discourse of decolonisation in higher education.

Population and Sampling

The target population consisted of mathematics research outputs, both published and unpublished, produced between 2014 and 2024 within three universities located in Ogun State, Nigeria. This decade-long timeframe was selected to capture contemporary shifts in the research landscape, including possible influences of global decolonisation discourses and national education reforms. A purposive sampling strategy was used to ensure the inclusion of diverse research categories and institutional contexts. From each of the three universities, fifteen (15) research outputs were selected, giving a total of forty-five (45) documents. The sample included journal articles, conference proceedings, master's dissertations, and doctoral theses. The inclusion of both published and unpublished work was crucial for providing a more comprehensive representation of the knowledge produced across academic and postgraduate platforms. The principle of information richness guided purposive selection—that is, choosing outputs most likely to yield insights into decolonisation, cultural relevance, and contextual application within mathematics research.

Inclusion Criteria

To ensure analytical consistency and relevance, research outputs were required to meet the following inclusion criteria:

- Research focus: The study must fall within recognised fields of mathematics, including pure and applied mathematics, mathematical modelling, statistics, or mathematics education.
- Publication type: Eligible materials included peer-reviewed journal articles, conference papers, or postgraduate theses/dissertations available in institutional repositories or public databases.
- Relevance to decolonisation: The research was required to show at least some alignment with decolonial themes—such as cultural contextualisation, use of indigenous knowledge, linguistic inclusivity, or community responsiveness.
- Time frame: Only outputs produced or published between 2014 and 2024 were included to capture recent developments in the field.

Data Collection

Data collection involved both manual retrieval and digital searches. Institutional repositories and university libraries were systematically searched using keywords such as mathematics education, indigenous knowledge, local problem-solving, applied mathematics, and decolonisation. Online academic databases, including Google Scholar, JSTOR, and institutional websites, were also utilised to access publicly available outputs. Each selected document was screened against the inclusion criteria. A structured data extraction matrix was then developed to record key variables, including publication year, research focus, methodological orientation, and explicit or implicit engagement with decolonisation themes. The matrix facilitated systematic organisation of both quantitative and qualitative data for subsequent analysis.

Data Analysis

Quantitative analysis was conducted using descriptive statistics to summarise the frequency and distribution of research categories across institutions. Tables and charts were produced to illustrate patterns in research focus (e.g., pure vs applied mathematics), thematic orientation, and temporal trends over the ten years. For the qualitative component, thematic analysis followed the six-phase framework of Braun and Clarke (2006), which includes familiarisation with the data, generation of initial codes, theme identification, review, definition, and reporting. Codes were inductively derived from the content of research outputs, focusing on indicators of decolonisation—such as engagement with indigenous epistemologies, responsiveness to local problems, and inclusive pedagogical approaches. A cross-case analysis was then performed to compare findings across the three universities, highlighting institutional similarities, divergences, and unique approaches to decolonial mathematics research. This comparative analysis provided a basis for drawing broader conclusions about the epistemic orientation of mathematics research in Ogun State.

Ethical Considerations

The study adhered to established ethical standards for research involving secondary data. Formal permission was obtained from institutional repositories prior to accessing unpublished theses and dissertations. All data were handled with strict confidentiality, and findings were reported in aggregated form to prevent the identification of specific authors or institutions. Furthermore, academic integrity was maintained through accurate referencing of all research outputs and scholarly sources. Since the study involved analysis of existing materials rather than direct human participation, ethical risks were minimal. Nonetheless, due diligence was exercised to ensure transparency, respect for intellectual property, and compliance with institutional review protocols.

Limitations

While the study offers valuable insights into the decolonisation of mathematics research in Ogun State, several limitations are acknowledged:

1. Geographical scope: The study focuses on only three universities within a single state; therefore, the findings may not be generalisable to all Nigerian or African higher education institutions.
2. Data availability: The reliance on published and archived research outputs excludes informal or classroom-based innovations that may embody decolonial principles but are not documented in academic repositories.
3. Access constraints: Some institutional repositories restricted access to unpublished theses or dissertations, potentially narrowing the dataset and limiting the representativeness of the findings.

Despite these constraints, the study provides a robust foundation for understanding emerging patterns in mathematics research. It sets the stage for future, more expansive investigations into decolonising STEM disciplines across Africa.

3. Findings

The qualitative analysis of forty-five (45) research outputs drawn from three universities in Ogun State provides a nuanced picture of mathematics research in the region. The findings reveal a field still largely shaped by Eurocentric epistemological orientations, yet showing nascent movements towards cultural relevance and contextual responsiveness. The results are presented under four interrelated themes, supported by quantitative distribution patterns that illuminate institutional variations.

1. Dominance of Eurocentric Research Focus

Across all three universities, the majority of research outputs—approximately two-thirds—were situated within traditional domains of pure mathematics, abstract theoretical models, and computational simulations. Such work reflects the long-standing emphasis on universal mathematical principles over context-specific or applied problem-solving. Institutions B and C displayed the highest concentration of Eurocentric research, with 46.7% and 60% of their outputs, respectively, categorised as pure mathematics. This dominance mirrors earlier findings that African mathematics research often reproduces Western paradigms in both topic selection and methodological orientation (Olayemi & DeBoer, 2021; Iyamuremye et al., 2021). While the pursuit of theoretical rigour contributes to global scholarly discourse, the relative absence of research addressing local socio-economic or developmental issues suggests an ongoing epistemic dependency. The findings, therefore, underscore the continuing influence of colonial knowledge hierarchies in shaping what counts as legitimate mathematical inquiry (Maldonado-Torres, 2007; Opstaid, 2019).

2. Limited Integration of Indigenous Knowledge

The integration of indigenous mathematical systems and locally grounded knowledge was notably limited across the sample. Few research outputs engaged with mathematical ideas derived from indigenous practices such as traditional architecture, agricultural cycles, local measurement systems, or market-based calculations. For instance, none of the analysed outputs examined indigenous counting systems, ethnomathematics in local crafts, or context-specific problem-solving frameworks rooted in community experience. This absence aligns with Gerdes' (1999) and Setati and Adler's (2001) observations that indigenous mathematical thought remains marginalised in formal academic discourse. The findings also highlight the structural barriers—such as curriculum rigidity, publication norms, and research funding priorities—that continue to privilege Western epistemologies over local intellectual traditions. Consequently, the knowledge produced remains detached from the lived realities and cognitive frameworks of local learners and practitioners.

3. Emerging Cultural Relevance

Despite these limitations, a small but significant cluster of research outputs, particularly within mathematics education departments, demonstrated efforts to make mathematics more culturally responsive. Examples included studies investigating the pedagogical value of using indigenous languages in mathematics instruction, or research exploring the incorporation of learners' cultural contexts into the teaching of mathematical concepts. Such initiatives, though relatively few, represent important attempts to bridge the gap between abstract

mathematical theory and local knowledge systems. They also resonate with Naidoo's (2021) argument that the use of indigenous languages and culturally situated pedagogy enhances learner engagement and conceptual understanding. These emerging examples suggest a growing recognition among some researchers of the need to make mathematics education more inclusive, relatable, and socially meaningful.

4. Inclusivity and Local Challenges

Research focusing explicitly on inclusivity and community-based problem-solving was limited. Few studies engaged with issues affecting rural or under-resourced schools, gender disparities in mathematics participation, or barriers facing learners with disabilities. Most outputs overlooked the application of mathematics to community challenges such as agricultural planning, urban development, resource management, or environmental sustainability—areas where locally grounded mathematical models could make tangible contributions. Nevertheless, a small subset of research outputs did examine questions of equity within mathematics education, addressing topics such as classroom participation, assessment fairness, and curriculum adaptation for diverse learners. These studies, although in the minority, signal a potential shift toward more socially responsive and inclusive forms of mathematics research. They indicate that an emerging discourse of educational equity is beginning to take root, offering pathways for future inquiry and institutional reform.

Quantitative Distribution of Publications

The quantitative analysis further clarifies institutional differences in research orientation. Institution A exhibited a relatively diverse research portfolio, with 26.7% of outputs addressing community issues and 20% situated within mathematics education. Institution B's research profile was more traditional, dominated by pure and computational mathematics (46.7%) with limited applied engagement (20%). Institution C, by contrast, produced exclusively theoretical and computational work, showing no evidence of locally contextualised or decolonial research. Overall, these findings illustrate that mathematics research across the three Ogun State universities remains predominantly Eurocentric, with limited but emerging areas of culturally relevant and inclusive inquiry. The quantitative and qualitative evidence together underscore the urgent need for policy and institutional interventions to encourage decolonial, community-focused, and contextually grounded mathematics research.

Table 4.1: *Overview of Publications by Institution*

Institution	Pure Mathematics	Applied Mathematics	Mathematics Education	Total Publications
A	2	10	3	15
B	7	8	0	15
C	9	6	0	15

Focus on Local Challenges

The following table shows the proportion of publications addressing local challenges, highlighting the institutions that have made efforts in this area.

Table 4.2: *Focus on Local Challenges*

Institution	Publications addressing Local Challenges	Total Publications	Percentage
A	4	15	26.7%
B	3	15	20.0%
C	0	15	0.0%

The table below shows the number of publications addressing decolonisation efforts across the institutions.

Table 4.3: *Decolonisation Efforts*

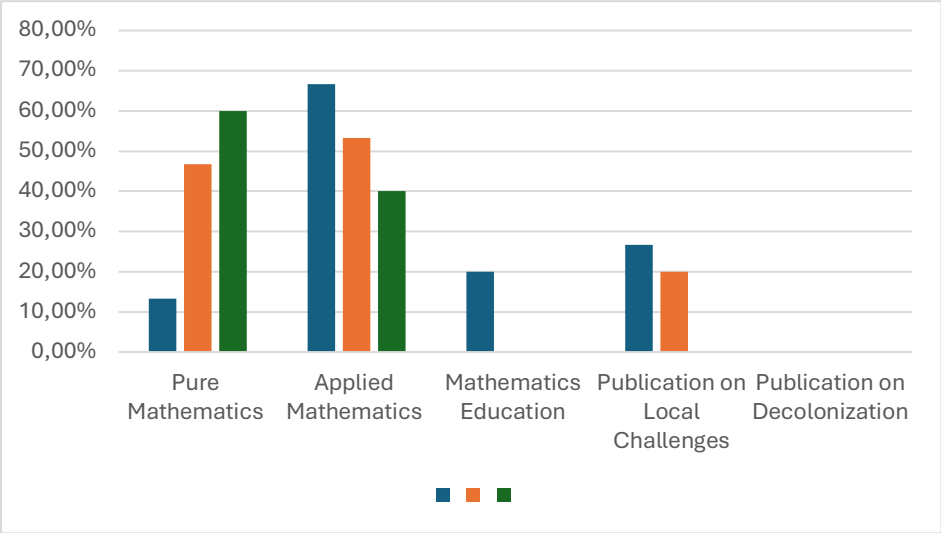
Institution	Publications Addressing Decolonisation	Total Publications	Percentage
A	0	15	0%
B	0	15	0%
C	0	15	0%

Table 4.4: *Comparative Research Focus*

Research Category	TASUED (%)	OOU (%)	FUNAAB (%)
Pure Mathematics	13.3%	46.7%	60.0%
Applied Mathematics	66.7%	53.3%	40.0%
Publication on Local Challenges	26.7%	20.0%	0.0%
Publication on Decolonisation	0.0%	0.0%	0.0%

Graphical Representations

Bar Chart*: Distribution of Publications by Category*



Discussion

The findings from universities in Ogun State reveal a dual landscape marked by the persistence of Eurocentric orientations and emerging, though limited, attempts to contextualise mathematics research within local realities. The discussion is structured around four critical insights derived from the data. The distribution of research outputs (Table 4.1) indicates that pure mathematics and abstract theoretical work dominate across all institutions—most prominently at Institutions B and C, where 46.7% and 60% of the outputs, respectively, were classified as pure mathematics. This pattern supports earlier critiques that Nigerian mathematics research continues to privilege theoretical contributions over locally responsive or problem-solving approaches (Olayemi & DeBoer, 2021; Iyamuremye et al., 2021). While such work aligns with international expectations of academic rigour and global scholarly standards, its limited responsiveness to immediate socio-economic challenges perpetuates colonial hierarchies of knowledge (Maldonado-Torres, 2007; Opstaid, 2019).

Institution A, however, exhibited relatively greater engagement with community-based or applied research, with 26.7% of its publications addressing local issues, compared with 20% at Institution B and none at Institution

C (Table 4.2). This difference suggests a modest but growing awareness of the importance of context-driven research in mathematics. Nevertheless, such engagement remains peripheral to the dominant research culture. The absence of locally focused research at Institution C is particularly concerning, as it illustrates how mathematics research risks becoming detached from the lived realities of the communities it is meant to serve (Lerman, 2019).

The most salient finding is that none of the three institutions produced research explicitly grounded in decolonisation principles (Table 4.3). This omission reflects the entrenched marginalisation of indigenous knowledge systems within Nigerian higher education (Osibodu, 2024; Ngubane & Makua, 2021). Despite ongoing global debates on decolonising curricula and knowledge production (Burgess et al., 2022; Shahjahan et al., 2022), mathematics research in Ogun State remains overwhelmingly Eurocentric, with minimal evidence of epistemic transformation. This persistent gap underscores the need for systemic and institutional reform to align research priorities with decolonial and socially responsive imperatives. Institution A also demonstrated a comparatively diverse research portfolio, with 20% of its outputs focusing on mathematics education (Table 4.4). This subfield provides a valuable avenue for embedding culturally relevant pedagogies and experimenting with indigenous approaches to mathematics teaching and learning (Naidoo, 2021; Abdulrahim & Orosco, 2020). Although such efforts remain marginal compared with dominant abstract research traditions, these innovative initiatives represent meaningful entry points for advancing decolonisation within mathematics research.

Overall, the findings reveal an apparent misalignment between mathematics research practices in Ogun State and the broader goals of decolonisation. Institutional research agendas remain tethered to Eurocentric paradigms, while engagement with local contexts, languages, and indigenous epistemologies is limited. Without deliberate structural and policy-level interventions, mathematics research risks reproducing epistemic inequalities and perpetuating dependency on Western knowledge systems (Handoyo et al., 2022; Ndlovu & Woldegiorgis, 2024; Widayat et al., 2025). To move towards a more equitable and contextually grounded mathematics research culture, several practical strategies are proposed:

- Establish dedicated funding mechanisms to incentivise research that addresses community-specific and locally relevant challenges.
- Promote interdisciplinary collaboration between mathematicians, education specialists, and indigenous knowledge practitioners.
- Introduce decolonisation benchmarks within departmental and national research evaluation frameworks to monitor progress.
- Expand research in mathematics education that connects curricula to indigenous languages, cultural practices, and learners' lived experiences.

Collectively, these strategies would enable mathematics research in Nigerian higher education to evolve from an abstract, externally oriented discipline to one that contributes directly to social transformation and epistemic justice. This study has several limitations that should be acknowledged. First, the analysis was restricted to three universities in Ogun State, which may limit the generalisability of the findings to other Nigerian or African contexts. While these institutions provide valuable insights into mathematics research trends, a broader sample across multiple states could provide a more comprehensive picture. Second, the dataset relied primarily on documented research outputs such as journal articles, conference papers, and theses. Informal or unpublished innovations—such as classroom practices, community-based projects, or oral knowledge exchanges—were not captured, potentially narrowing the scope of decolonisation practices identified. Third, access to specific institutional repositories was constrained, and some relevant outputs may not have been digitised, leading to potential gaps in the dataset. Finally, the study focused on content analysis of research outputs rather than on interviews with academics or policymakers; as such, it does not capture the perspectives of researchers themselves regarding barriers to or motivations for decolonisation.

The findings of this study hold important implications for policy, pedagogical practice, and future research:

Policy Implications: Institutional research policies should deliberately foreground decolonisation by embedding indigenous knowledge systems, cultural relevance, and inclusivity within research funding priorities and evaluation frameworks. National higher education bodies, such as the National Universities Commission (NUC), could establish benchmarks requiring mathematics departments to demonstrate how their research engages with local contexts and contributes to societal development. Such measures would ensure that research outputs not only meet global standards but also respond to national and community needs.

Pedagogical Implications: Curriculum design in mathematics education should purposefully integrate indigenous knowledge systems—such as traditional counting methods, architectural patterns, and market-based problem-solving approaches—to enhance contextual and cultural relevance. Furthermore, language policies should encourage the use of indigenous languages in mathematics teaching and learning, as evidence indicates

that this approach improves both comprehension and learner engagement (Naidoo, 2021). Such linguistic inclusivity also promotes epistemic access and learner confidence.

Research Implications: Future research should employ qualitative methods, particularly in-depth interviews with academics and researchers, to explore institutional and individual barriers to embedding decolonisation within mathematics research. Additionally, comparative studies conducted across multiple provinces or African countries could reveal broader regional patterns, thereby contributing to continental efforts to decolonise STEM disciplines and promote knowledge equity.

Conclusions

The study analysed the mathematics research outputs of the three universities located in Ogun State, Nigeria, to evaluate their compliance with the principles of decolonisation. The outcome of the research shows that the research community is still predominantly influenced by the European paradigm, which gives precedence to pure mathematics and abstract modelling rather than contextualised research. The research culture was observed to be very limited in the areas of applied mathematics and mathematics education, and there was little evidence of systematic engagement with indigenous knowledge or the use of explicit decasualization agendas. The lack of research focused on decolonisation illustrates the need for a change in the structure of research priorities, funding models, and evaluation mechanisms. The institutions should become the active players that facilitate the conduct of research that is culturally relevant, inclusive and adaptive to the specific problems of the Nigerian communities. Indigenous epistemologies and inclusivity can be integrated into Mathematics research. Thus, Mathematics research can be more effective in contributing to national development and participating in the global debates on epistemic justice. On the other hand, the decolonisation of mathematics research in Nigerian universities can no longer be seen as an academic exercise but rather as a critical step towards knowledge production that mirrors local realities, empowers communities, and confronts the colonial legacy in higher education that is already deeply rooted.

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