



MEDIA AND POLICY REPRESENTATION OF MATH EDUCATION IN GHANA AND NIGERIA

Research Brief

WHAT THIS RESEARCH IS ABOUT

Indigenous communities in Ghana and Nigeria practiced diverse forms of mathematics for thousands of years before the dominance of Western mathematical traditions. Examples of Indigenous mathematics include the geometric precision of Adinkra symbols, the binary coding structure inherent in Nigeria's Ifa divination system, and traditional games such as *Oware* and *Achi*, which demonstrate counting and pattern recognition (Yaro et al., 2026).



Ghanian Adinkara symbols



Oware players in Kumasi, Ghana

Ghana and Nigeria's educational systems have been greatly impacted by colonization. Before formal education was introduced, mathematics was used in Nigeria for farming and trade. Education in pre-colonial Ghana was mostly informal and rooted in cultural practices. Following independence from colonial rule, both Ghana and Nigeria prioritized mathematics education as essential to nation-building and economic development (Yaro et al., 2026). Since then, both countries have implemented curriculum reforms and educational policies that position mathematics as a key driver of global competitiveness.

Despite independence, the legacies of colonization continue to shape how mathematics is taught in Ghana and Nigeria. Many African Indigenous mathematical practices remain excluded or undervalued within formal education systems, despite the historical and cultural significance.



Integrating African mathematical practices into formal education can foster culturally responsive mathematics education.



WHAT YOU NEED TO KNOW

Ghana and Nigeria have undergone significant nation-building and education reforms post-colonization. Although mathematics is often viewed as "culture-free," culture, policy, and history shape it. Education policies directly influence mathematics education, while media narratives shape attitudes towards math. An analysis of Ghanaian and Nigerian media and policy documents revealed six key storylines on the perceptions of mathematics education. Key storylines included mathematics as a driver of national development; a gatekeeper to STEM fields; a tool for advancing gender equity; and an arena influenced by international policy agendas. This brief calls for a shift in math teaching and offers several recommendations.

WHAT THE RESEARCHERS DID



The researchers examined how mathematics is taught and perceived in Ghana and Nigeria by analyzing media publications and educational policy documents. The media outlets were chosen for their widespread influence in Nigerian and Ghanaian media landscapes. Policy documents were selected based on their relevance to mathematics education and national education priorities.

1. **What mathematics storylines exist in media and policy documents in Ghana and Nigeria?**
2. **What historical experiences are reproduced in these storylines in Ghana and Nigeria?**

Similar storylines were combined to create broader themes, while some were eliminated because they appeared infrequently in the document or were outside of the scope of the study.

The following theoretical frameworks were used in the study:

Storylines: The social structures, narratives, or known stories that people use to understand and make sense of an interaction or experience.

Positioning theory: Explains how people use language and storylines to position themselves and others within social interactions.

Post-Colonial theory: Examines how the effects of colonization continue to influence knowledge, culture, power, and social systems. The researchers used this theory to understand how dominant narratives may privilege particular forms of mathematical knowledge while marginalizing others.

WHAT THE RESEARCHERS FOUND

The researchers identified **six dominant storylines** that shape perceptions of mathematics in Ghana and Nigeria.

International Organizations Use Results-Based Financing

International funding agencies often tie financial support for African countries to standardized outcomes, which can limit the autonomy of policymakers to design curricula that reflect community needs and unintentionally promote Western-centric educational models.

Mathematics for National Growth and Development

Media reports revealed that governments and educational authorities in Ghana and Nigeria promote mathematics as an area of study essential for supporting economic growth and developing critical infrastructure.



International agencies can reinforce **neo-colonialism** when external actors shape national education priorities (Tikly, 2016).

WHAT THE RESEARCHERS FOUND

Mathematics Functions as a Gatekeeper to STEM

Mathematics often acts as a gatekeeper, shaping access to higher education and career pathways. In Ghana and Nigeria, passing mathematics is often required for university entry and pursuit of STEM and business careers (Yaro et al., 2026). However, this emphasis can create barriers for learners whose strengths lie in other disciplines or ways of thinking.

Teaching reforms can be informed by research and successful practices from other countries. However, they are most effective when adapted to local experiences and educational contexts (Yaro et al., 2026).

Mathematics is Abstract and Difficult

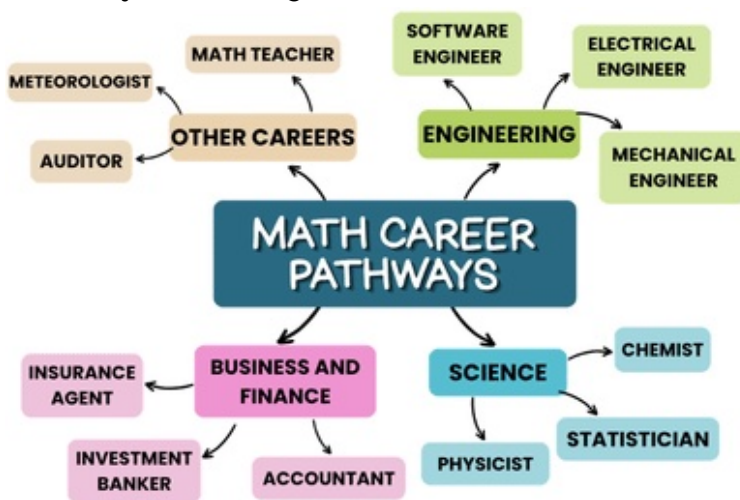
Students in Ghana and Nigeria often perceive mathematics as difficult and disconnected from everyday life. These perceptions can increase mathematics anxiety, decrease confidence, and prevent students from pursuing STEM subjects and careers.

Media narratives often attribute these perceptions to mathematics instruction that emphasizes formulas and examination performance over real-world applications. There are growing calls in Ghanaian and Nigerian media to integrate Indigenous knowledge and connect teaching to students' cultural contexts to decolonize mathematics and make it more engaging.

Mathematics As a Tool For Advancing Gender Equity

Gender gaps in mathematics remain a global concern. Ghanaian and Nigerian media storylines highlight that the governments in both countries have implemented initiatives, such as mentorship programs, to increase girls' participation in mathematics and STEM disciplines (Yaro et al., 2026).

Ghana's Ministry of Education requires teachers to foster gender equity by providing equal leadership opportunities, encouraging participation, and offering fair feedback to all learners (Ministry of Education, 2017).



Instructional Practices Affect How Children Learn Mathematics

This storyline emphasizes that students often find mathematics intimidating because teachers use ineffective teaching strategies that focus on memorization, which limits meaningful engagement and deeper understanding.

Media and policy documents call for more diverse math teaching strategies, stronger connections to students' lived experiences, and the use of creative assessments to better support students' (Modern Ghana, 2021, para. 3).

WHY THIS MATTERS



Mathematics is not “Culture-Free”

Mathematics should be understood as culturally grounded rather than culture-free. Mathematics is influenced by history, public narratives, policies, colonial legacies, and global development agendas. When the agendas of international agencies overlook local contexts and priorities, they can reinforce *soft imperialism* in mathematics education.



Soft imperialism: The subtle influence of powerful countries or international organizations on another country's policies, or education without direct political control.

Mathematics as a Gateway

Positioning mathematics as a gatekeeper to STEM fields can reinforce deficit narratives and create barriers for students whose mathematical thinking is rooted in Indigenous or community-based knowledge systems. Instead, math should be presented as a gateway to opportunities that is inclusive of diverse knowledge systems.



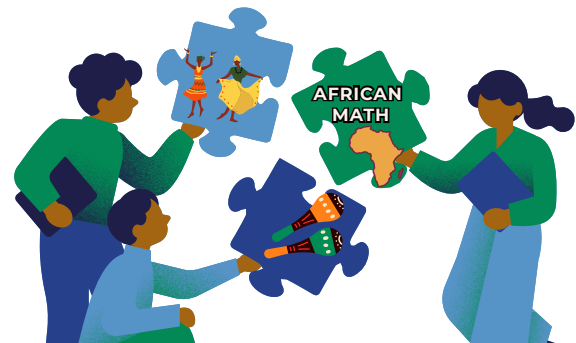
Valuing multiple ways of knowing makes math inclusive.

Canadian Context

Nigeria and Ghana represent the two largest African immigrant groups in Canada (Statistics Canada, 2023). Canadian classrooms are becoming increasingly diverse, highlighting the need for culturally responsive mathematics teaching that promotes equitable learning opportunities. Understanding the storylines surrounding mathematics can support culturally inclusive teaching for immigrant and refugee students.

Decolonizing Mathematics Learning

Math education can be decolonized by integrating Indigenous knowledge and ethnomathematics into classroom practices (Yaro et al., 2026). This approach would benefit all students by promoting multiple ways of thinking, strengthening cultural awareness, and fostering more inclusive classrooms.



Gaps

Absent from these storylines is a discussion of Indigenous and Afrocentric mathematical practices. Further research is needed to examine how African Indigenous mathematics is represented in media and policy and how these knowledge systems can be integrated into mathematics curricula.

RECOMMENDATIONS

Ministry of Education, Educational Authorities, and Policymakers

- Revise curricula to recognize Indigenous African mathematical knowledge systems and promote more inclusive teaching practices.
- Implement initiatives that encourage girls to participate in math and support teachers in addressing gender gaps.
- Collaborate with community organizations, universities, and cultural experts to co-develop resources that promote Afrocentric knowledge systems.



Teachers

- Connect mathematics learning to students' lived experiences and cultural contexts by using real-world examples and incorporating African mathematical practices.
- Adopt an asset-based perspective that recognizes students' cultural knowledge as a strength rather than a barrier to learning.
- Foster female students' interest in mathematics by addressing barriers.

Researchers

- Explore teaching approaches that draw on African mathematical knowledge to inform mathematics instruction.
- Examine math storylines across diverse contexts and compare them with Sub-Saharan African storylines.

WHAT CAN BE DONE IN THE CANADIAN CONTEXT

Educational Authorities and Teacher Regulatory Bodies

- Integrate Indigenous, African, and other mathematics approaches into the curriculum.
- Develop policies to promote girls' and underrepresented students' engagement with math.
- Integrate culturally responsive and gender-inclusive training into undergraduate teacher education and certification standards.

Community Members

- Learn about African games and identify mathematical practices within your own community and culture.
- Promote positive views of mathematics by challenging gender stereotypes and Eurocentric assumptions.

Teachers and Settlement Workers

- Recognize that math is not culture-free and value diverse mathematical thinking.
- Teach mathematics using real-world activities and Indigenous African games (e.g., Achi).
- Develop homework clubs and after-school activities that integrate the experiences of Sub-Saharan African immigrant students.

REPRESENTATION OF MATH EDUCATION IN GHANA AND NIGERIA

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ABOUT PRAN

PRAN is a partnership of universities, community-based organizations, and government organizations interested in the experiences of Sub-Saharan African immigrants and refugees (SSAIs) in Canada. PRAN members are posing new questions and approaches grounded in non-Western ways of knowing to develop valuable evidence-based resources to support SSAIs to thrive in Canada. PRAN is co-funded provided by SSHRC & PRAN partners. www.pran-network.ca



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