Impact of Culturally Responsive Teaching on Mathematics Lessons among Underrepresented Learners as Perceived by Teachers

Olorunsola Oriola NIYI
Federal University of Education Kontagora
Niger State
niyisola@gmail.com
+2348037583903

Abstract
This study explores teachers' perceptions of culturally responsive teaching (CRT) and its impact on Mathematics lessons among underrepresented students. As educational systems strive to address equity, diversity, and inclusion in Mathematics, CRT has emerged as a promising instructional framework that acknowledges and incorporates students' cultural backgrounds into the teaching-learning process. Using a descriptive methods approach, the study examines how Mathematics teachers in Kontagora LGA understand, value, and implement CRT strategies in diverse classrooms, and how these practices relate to student performance. The sample size for the study was 212 teachers drawn from primary and secondary schools across Kontagora LGA of Niger state. Data was collected using a questionnaire tagged "Culturally Responsive Teaching of Underrepresented Mathematics Teacher's Questionnaire". The instrument was validated by experts and its reliability index was 0.88. Findings revealed that teachers perceive CRT as an effective means of supporting academic success among marginalized student populations and to identify specific strategies that contribute to improved Mathematics learning. The study recommended amongst others that School administrators and policymakers should invest in ongoing professional development focused on culturally responsive teaching strategies, specifically within the Mathematics curriculum.
Keywords: Culturally Responsive Teaching, Mathematics performance, Underrepresented

Word Count: 185

Introduction

Culturally Responsive Teaching (CRT) is far more than a mere instructional technique; it is a profound educational philosophy that asserts that for learning to be truly effective, it must serve as a bridge connecting the schoolroom to the student's world. This pedagogy is built on the foundational belief that a student's cultural knowledge, prior experiences, and frames of reference are not obstacles to be overcome but are, in fact, the most powerful assets upon which to build new learning (Abdalla & Moussa, 2024). In a nation as magnificently diverse as Nigeria, with its over 250 ethnic groups and myriad languages, traditions, and worldviews, the adoption of CRT moves from being a pedagogical choice to an educational imperative (Majebi & Oduolowu, 2021). The Nigerian classroom is a microcosm of this national diversity, and CRT provides the framework to transform this potential challenge into its greatest strength.

The evolution of CRT is rooted in the work of scholars like Gloria Ladson-Billings and Geneva Gay, who articulated a vision of education that empowers students intellectually and socially by using cultural referents to impart knowledge (Lakhwani, 2023). Ladson-Billings proposed a model based on three pillars: a commitment to academic success, the development of cultural competence, and the fostering of sociopolitical consciousness. Geneva Gay further refined this into a practical pedagogy that validates and affirms students' cultural identities through curriculum, instruction, and classroom climate.CRT translates to an educational approach that actively counters the lingering colonial legacy which often positioned Western knowledge systems as superior to indigenous ones (Cambaya & Sariana, 2025). CRT offers a path to decolonize the classroom, affirming that a child's Yoruba, Igbo, Hausa, Kanuri, or Ijaw heritage is a source of intellectual wealth, not a deficit to be corrected.

Applying the principles of CRT to Mathematics education in Nigeria is particularly crucial, as Mathematics is often wrongly perceived as a culture-neutral subject. The reality is that the contexts of word problems, the emphasis on individual speed over communal deliberation, and the very history of Mathematics as taught often alienate Nigerian students (Ayanwoye et al., 2025). CRT in Nigerian Mathematics would involve disrupting this myth of neutrality by celebrating the mathematical genius inherent in Nigerian cultures such as the geometric precision of *Uli* and *Adire* patterns, the computational logic of traditional markets (*barka da sune*) where mental arithmetic and profit calculations are practiced daily, or the architectural principles behind

traditional round huts and communal spaces. Teaching statistics through the analysis of local population data, exploring probability through familiar games like *Ayo* or *Ludo*, and teaching geometry through the study of Nigerian art and craft make learning instantly more relevant and accessible. It values the mental Mathematics strategies a child learns from a market-trader parent as highly as the formal algorithmic method taught in the textbook (Ayanwoye et al., 2025).

The theoretical foundations of CRT are powerfully aligned with the Nigerian social fabric. Lev Vygotsky's sociocultural theory, which posits that all learning is mediated through social and cultural interaction, explains why a Nigerian child learns best when concepts are presented within a familiar cultural context (Niyi et al., 2024). The classroom becomes a true learning community, reflecting the communal ethos of Nigerian societies like the *Igbajo* in Yorubaland or *Umunna* in Igboland, where knowledge is traditionally built collectively. The concept of "Funds of Knowledge" directs Nigerian teachers to look upon the households of their students not as lacking resources, but as repositories of vast cultural and cognitive wealth. A child from a fishing community in Bayelsa understands concepts of volume, buoyancy, and sustainability. A child from an agricultural family in Jos understands ratios of seeds to yield, seasonal cycles, and area calculation (Awofala & Fatade, 2023). Constructivism tells us that these pre-existing schemas are the foundation upon which all new knowledge must be built. Therefore, for a Nigerian teacher, CRT is the practical application of these theories: it is the act of weaving the rich, textured tapestry of Nigerian cultures directly into the curriculum to create a learning environment that is both academically rigorous and culturally sustaining, ensuring that students not only succeed in Mathematics but also retain a strong and proud sense of their identity (Garba, 2024).

The term underrepresented students refers to groups of learners who face systemic barriers that limit their access to and success in education, often resulting in significant academic disparities (Jacob & Dike, 2023). These students are marginalized by overlapping socioeconomic, cultural, and geographical challenges. A major group includes geographically and socio-culturally disadvantaged children, particularly in northern states such as Niger, where school attendance rates are much lower than in the southern regions. Economic hardship and socio-cultural norms that discourage formal schooling further deepen this educational gap (Monjaras-Gaytan & Sánchez, 2023). Girls and female students are also disproportionately affected, especially in northern Nigeria, where more than half of all girls are out of school. Despite national gender equality policies, many families still prioritize education for boys over girls. Children from low

socioeconomic backgrounds face additional challenges, as limited financial resources, lack of educational materials, and minimal parental support often hinder their academic progress (Garba, 2024). Students with disabilities, including those with physical impairments, visual or hearing challenges, autism, or Down syndrome, also remain marginalized, although recent efforts aim to make education more inclusive for these learners. Children in conflict-affected areas, particularly in the North-East, experience significant disruptions to their education due to violence, school closures, and damaged infrastructure, leaving millions in urgent need of emergency educational support. This complex reality highlights the pressing need for inclusive, context-sensitive strategies to bridge educational gaps and improve outcomes for these underrepresented groups across Nigeria.

These challenges are not borne equally across the Nigerian population. They disproportionately affect underrepresented and marginalized groups, exacerbating existing social inequalities. Students in rural communities face a double jeopardy: they suffer from all the systemic issues in an amplified form, with even fewer qualified teachers, more dilapidated infrastructure, and less access to educational resources like textbooks or technology compared to their urban counterparts (Bullock et al., 2021). Children from low-income communities are often forced out of school or into under-resourced public schools, their mathematical potential stifled by economic pressures and the lack of a supportive learning environment at home. Girls in Mathematics face additional socio-cultural barriers, including gendered stereotypes that deem the subject a male domain, a lack of female role models in STEM, and, in some regions, societal pressures that prioritize early marriage over prolonged education (Hanna, 2002). Furthermore, learners with special needs remain the most neglected group; the Nigerian education system is overwhelmingly ill-equipped with the resources, trained personnel, and inclusive policies to cater to their learning requirements, effectively shutting them out of mathematical literacy entirely. This systemic failure to provide equity in Mathematics education not only wastes immense human potential but also actively perpetuates cycles of poverty and underdevelopment.
In the Nigerian context, underrepresentation in Mathematics classrooms is not merely about who is present in the class, but about who is actively participating, succeeding, and being encouraged to see themselves as mathematically capable (Toromade et al., 2024). It manifests in the glaring disparities in achievement and participation rates between demographic groups. The factors driving this underrepresentation are deeply intertwined with Nigeria's socioeconomic and cultural

fabric. Socioeconomic factors are perhaps the most powerful determinant. Poverty limits access to quality schools, private tutoring, textbooks, and a quiet place to study and children into labour, directly competing with school time (Uzoka & Igwe, 2015). Cultural factors play an equally critical role. English as the language of instruction becomes a significant barrier for many children whose first language is indigenous, causing them to struggle with mathematical concepts not because they lack logical reasoning, but because of linguistic incomprehension (Oyeleye, 2025). Furthermore, as discussed, certain cultural norms can discourage girls' participation in STEM fields. The international discourse on Mathematics education, led by organizations like the International Commission on Mathematical Instruction (ICMI), has long shifted from a focus solely on excellence to a dual focus on excellence and equity (Hanna, 2002). The United Nations Sustainable Development Goal 4 (Quality Education) explicitly targets eliminating gender and wealth disparities in education. Global research has conclusively shown that equity in Mathematics education is not a zero-sum game; raising the achievement of the lowest-performing groups through targeted support improves the overall mathematical proficiency of the entire nation (Toromade et al., 2024). Countries that have made strides in this area, such as Finland or Singapore, invest heavily in teacher quality, equitable resource distribution, and inclusive pedagogies. For Nigeria, engaging with this global perspective is crucial. It moves the conversation from blaming students and communities for failure to critiquing and reforming the system that fails them (Oyeleye, 2025). Achieving equity in Mathematics is therefore a fundamental matter of social justice and a critical strategic investment in Nigeria's human capital, economic future, and national cohesion (Uzoka & Igwe, 2015).

Statement of the Problem

In the Nigerian context, underrepresentation in Mathematics is characterized by significant disparities in achievement, participation, and self-perception as mathematically capable among different demographic groups. This inequity is driven by an interplay of socioeconomic factors, such as poverty limiting access to educational resources, and cultural factors and norms that marginalize certain groups like girls in STEM (Awofala & Fatade, 2023). While the global educational discourse has shifted towards a dual focus on excellence and equity, and research confirms that raising the achievement of underrepresented groups benefits national proficiency, the Nigerian system often fails these learners. Culturally Responsive Teaching (CRT) is posited as

a pedagogical approach that can address these disparities by making instruction more relevant and accessible. However, there is a lack of focused research on how teachers, who are central to implementing such strategies, perceive the effectiveness of CRT in improving Mathematics performance among underrepresented secondary school students in Nigeria. The specific practices they find effective, the perceived impact on student motivation and confidence, and the challenges they face in implementation are not well understood, this hinders the development of targeted support and systemic reform for underrepresented Mathematics learners.

Aim and Objectives of the Study

The aim of this study is to investigate teachers' perceptions of the impact of Culturally Responsive Teaching on the Mathematics performance of underrepresented learners and to develop recommendations for its effective implementation.

The specific objectives are to:

1. examine teachers' perceptions of the effectiveness of culturally responsive teaching in improving Mathematics performance among underrepresented secondary school students.
2. identify the culturally relevant instructional practices that teachers perceive as most effective in enhancing students' engagement and achievement in Mathematics.
3. assess teachers' perceptions of the relationship between culturally responsive teaching strategies and students' motivation, participation, and confidence in Mathematics learning.
4. investigate the challenges teachers face when implementing culturally responsive teaching strategies in Mathematics classrooms.
5. recommend strategies to strengthen the use of culturally responsive teaching practices for improving Mathematics outcomes among underrepresented students.

Research Questions

1. How do teachers perceive the effectiveness of culturally responsive teaching in improving Mathematics performance among underrepresented secondary school students?
2. What culturally relevant instructional practices do teachers identify as most effective in enhancing students' engagement and achievement in Mathematics?

3. How do teachers perceive the relationship between culturally responsive teaching strategies and students' motivation, participation, and confidence in Mathematics learning?
4. What challenges do teachers face when implementing culturally responsive teaching strategies in Mathematics classrooms?
5. What strategies can be recommended to strengthen the use of culturally responsive teaching practices for improving Mathematics outcomes among underrepresented students?

Methodology

This study adopted a descriptive survey research design to investigate teachers' perceptions of the impact of culturally responsive teaching (CRT) on Mathematics performance among underrepresented secondary school students in Nigeria. The survey design was chosen because it enables the collection of standardized data from a large group of respondents, allowing for the identification of patterns, trends, and relationships between variables. The study focused on teachers' perceptions since they play a central role in implementing culturally responsive strategies in Mathematics classrooms.

The population consisted of primary and secondary school Mathematics teachers in Kontagora local government of Niger State. A sample of 212 Mathematics teachers was drawn using a random sampling technique. Teachers were sampled from primary and secondary schools within Kontagora Local Government. The sample size was determined using Krejcie and Morgan (1970) sample size determination table, ensuring statistical adequacy for quantitative analysis. Data were collected using a structured questionnaire designed on a 4-point Likert scale (Strongly Agree = SA, Agree = A, Disagree = D, Strongly Disagree = SD). The instrument contained five major sections aligned with the research questions; culturally responsive teaching practices, student engagement, students' performance, challenges and barriers, recommendations for improvement. The instrument was subjected to face and content validity by a panel of experts in Mathematics education and educational research. Suggestions for improvement were incorporated before administration. Reliability was established through a pilot study involving 30 teachers in a nearby school not included in the main study. Cronbach's alpha was computed, yielding a coefficient of 0.88, indicating high internal consistency of the items (Tavakol & Dennick, 2011). Data were analyzed using both descriptive statistics included means, and standard deviations,

which provided insights into the extent of agreement with each item. Weighted means and standard deviations were calculated for each research question, with interpretations based on established cut-off points. The Average Weighted Mean for each item was calculated and interpreted using the following ranges: 3.50–4.00 (Strongly Agree), 2.50–3.49 (Agree), 1.50–2.49 (Disagree), and 1.00–1.49 (Strongly Disagree)

Results

RQ 1: How do teachers perceive the effectiveness of culturally responsive teaching in improving Mathematics performance among underrepresented secondary school students?

Table 1: Culturally Responsive Teaching Practices

SN	Item	SA	A	D	SD	Weighted Mean	Weighted SD	Decision
1	It is important to incorporate examples from students' cultural backgrounds in teaching Mathematics concepts	156	47	9	0	3.69	0.55	Strongly Agree
2	As a teacher I use culturally relevant instructional materials to explain mathematical concepts	73	92	37	10	3.08	0.84	Agree
3	I adapt my teaching strategies to match the learning styles of my students	100	112	0	0	3.47	0.50	Agree
4	I create opportunities for students to share their cultural experiences during lessons	37	129	38	8	2.92	0.71	Agree

The analysis of Table 1, Culturally Responsive Teaching Practices, provides key insights into how teachers integrate cultural responsiveness into Mathematics instruction within the Nigerian context. Findings reveal a strong agreement that incorporating examples from students' cultural backgrounds is essential for teaching mathematical concepts (*M = 3.69, SD = 0.55*). The relatively

low variability indicates a shared belief that connecting mathematical ideas to students' lived experiences enhances both comprehension and engagement in the classroom. There is also moderate agreement that culturally relevant instructional materials are used to explain mathematical concepts (*M = 3.08, SD = 0.84*). The slightly higher variability suggests differences in how consistently such materials are available or utilized, potentially reflecting disparities in teacher training, access to resources, or school-level support. Teachers also expressed strong support for adapting teaching strategies to match students' learning styles (*M = 3.47, SD = 0.50*). This finding reflects a widespread commitment to differentiated instruction, a fundamental aspect of culturally responsive pedagogy aimed at meeting the diverse needs of students. However, fewer teachers reported creating opportunities for students to share their cultural experiences during lessons (*M = 2.92, SD = 0.71*). This lower mean, combined with moderate variability, indicates that while cultural inclusion is valued, opportunities for student-driven cultural dialogue in Mathematics classrooms are less frequently implemented.

RQ 2: What culturally relevant instructional practices do teachers identify as most effective in enhancing students' engagement and achievement in Mathematics?

Table 2: Student Engagement

SN	Item	SA	A	D	SD	Weighted Mean	Weighted SD	Decision
5	Students show increased motivation when Mathematics lessons reflect real-life situations	148	46	0	18	3.53	0.87	Strongly Agree
6	Students participate actively when mathematical examples are linked to their culture	75	119	9	9	3.23	0.72	Agree
7	Students demonstrate more confidence when their cultures are acknowledged in class	101	111	0	0	3.48	0.50	Agree

8	Students ask more questions when culturally relevant strategies are applied	46	158	8	0	3.18	0.47	Agree

The analysis of Table 2, Student Engagement, provides valuable insights into teachers' perceptions of the effectiveness of culturally relevant instructional practices in enhancing students' engagement and achievement in Mathematics. Teachers strongly agreed that students show increased motivation when Mathematics lessons are connected to real-life situations (*M = 3.53, SD = 0.87*). Although the high mean reflects strong support for this practice, the moderate variability suggests that the consistency or quality of implementation may differ across classrooms. Acknowledging students' cultural backgrounds during lessons also received positive responses (*M = 3.48, SD = 0.50*). The relatively low variability indicates a broad consensus that recognizing students' cultural identities fosters greater confidence and promotes active participation, thereby enhancing classroom engagement and learning outcomes. Similarly, linking mathematical examples to students' cultures was positively rated (*M = 3.23, SD = 0.72*), though with moderate variability. This variability may stem from differences in teachers' familiarity with culturally responsive approaches or disparities in the availability of resources that support contextualized instruction. Applying culturally relevant strategies that encourage students to ask more questions demonstrated agreement among teachers (*M = 3.18, SD = 0.47*). The relatively low variability in responses suggests consistent recognition of the role these strategies play in stimulating curiosity and critical thinking, even though the slightly lower mean compared to other items may reflect less frequent or inconsistent application.

RQ 3: How do teachers perceive the relationship between culturally responsive teaching strategies and students' motivation, participation, and confidence in Mathematics learning?

Table 3: Students' Performance

SN	Item	SA	A	D	SD	Weighted Mean	Weighted SD	Decision
9	Culturally responsive teaching has improved students' problem-solving skills	47	156	9	0	3.18	0.48	Agree
10	Students demonstrate better performance in Mathematics tests due to relatable content	82	92	38	0	3.21	0.72	Agree
11	Students retain mathematical concepts longer when taught with culturally relevant methods	55	138	19	0	3.17	0.57	Agree
12	Students achieve better results when learning is connected to real-world applications	166	46	0	0	3.78	0.41	Strongly Agree

The analysis of Table 3, Students' Performance, provides insight into teachers' perceptions of the impact of culturally responsive teaching (CRT) strategies on students' motivation, participation, and confidence in Mathematics learning. Teachers generally agreed that CRT enhances students' problem-solving skills (*M = 3.18, SD = 0.48*). The low variability in responses suggests a consistent belief that culturally aligned instructional methods support students in approaching mathematical problems with greater confidence and competence. The data further indicate that relatable content positively influences Mathematics test performance (*M = 3.21, SD = 0.72*). The moderate variability here may reflect differences in how effectively teachers integrate relatable content into their lessons or variations in students' responsiveness based on diverse backgrounds and experiences. Teachers also expressed that students retain mathematical concepts longer when lessons incorporate culturally relevant methods (M = 3.17, SD = 0.57), highlighting the consistent value of contextualized teaching for improving long-term understanding and retention of mathematical concepts. The strongest agreement was observed regarding the belief that connecting Mathematics learning to real-world applications enhances student achievement (*M*

= 3.78, SD = 0.41). This finding reflects near unanimity among teachers that real-world relevance makes Mathematics more meaningful, engaging, and accessible, leading to improved academic performance.

RQ 4: What challenges do teachers face when implementing culturally responsive teaching strategies in Mathematics classrooms?

Challenges and Barriers

SN	Item	SA	A	D	SD	Weighted Mean	Weighted SD	Decision
13	Lack of adequate culturally relevant materials limits my ability to teach effectively	64	101	36	11	3.03	0.82	Agree
14	Time constraints prevent me from integrating culturally responsive approaches in every lesson	74	73	65	0	3.04	0.81	Agree
15	There is insufficient training for teachers on culturally responsive teaching methods	35	131	46	0	2.95	0.62	Agree
16	Some parents do not understand the importance of culturally responsive teaching	73	120	19	0	3.25	0.61	Agree
17	Large class sizes make it difficult to implement personalized, culturally relevant strategies	102	82	28	0	3.35	0.70	Agree

The analysis of Table 4, Challenges and Barriers, highlights the key obstacles teachers encounter when implementing culturally responsive teaching (CRT) strategies in Mathematics classrooms within the Nigerian context. A major challenge identified is the lack of adequate culturally relevant materials *(M = 3.03, SD = 0.82)*. The moderate variability in responses

indicates that while many teachers consistently experience this limitation, some have better access to resources, likely influenced by school location or funding levels. Time constraints also emerged as a significant barrier (*M = 3.04, SD = 0.81*), suggesting that the pressure to cover the curriculum often limits teachers' ability to integrate culturally responsive approaches consistently. Another critical issue is the insufficient training on CRT methods (*M = 2.95, SD = 0.62*), underscoring the need for more professional development programs to build teachers' competence and confidence in applying culturally responsive strategies effectively. Teachers reported limited parental understanding of the importance of CRT (*M = 3.25, SD = 0.61*). The relatively low variability in this response reflects strong agreement that improved communication and sensitization of parents could enhance support for culturally aligned instructional practices. The most pressing barrier reported is large class sizes (*M = 3.35, SD = 0.70*), which make it challenging to provide personalized and culturally relevant instruction, thereby reducing opportunities for interactive and differentiated teaching.

RQ 5: What strategies can be recommended to strengthen the use of culturally responsive teaching practices for improving Mathematics outcomes among underrepresented students?

Table 5: Recommendations for Improvement

SN	Item	SA	A	D	SD	Weighted Mean	Weighted SD	Decision
18	Professional development programs should be organized for teachers on culturally responsive pedagogy	101	101	10	0	3.43	0.58	Agree
19	Schools should provide resources for integrating culture into the Mathematics curriculum	92	102	18	0	3.35	0.63	Agree
20	Teachers should collaborate to share culturally relevant instructional practices	82	103	27	0	3.26	0.67	Agree

21	School leadership should recognize and encourage culturally responsive teaching efforts	93	100	8	11	3.30	0.77	Agree

The analysis of Table 5, highlights several strategies that teachers believe could strengthen the use of culturally responsive teaching (CRT) practices to improve Mathematics outcomes among underrepresented students. The results revealed that organizing professional development programs focused on culturally responsive pedagogy received the highest support *(M = 3.43, SD = 0.58)*, indicating strong consensus among teachers on the importance of equipping educators with the necessary skills and knowledge for effective CRT implementation. Similarly, the provision of adequate resources for integrating cultural elements into the Mathematics curriculum was highly endorsed *(M = 3.35, SD = 0.63)*, suggesting that while teachers value this strategy, variability exists due to differences in resource availability across schools. Collaboration among teachers to share culturally relevant instructional practices also emerged as a key recommendation *(M = 3.26, SD = 0.67)*, reflecting the need for peer support and professional learning communities to enhance culturally responsive teaching strategies. Teachers highlighted the importance of leadership support and recognition of CRT efforts *(M = 3.30, SD = 0.77)*. The slightly higher variability here suggests that while some schools actively promote and support CRT, others may lack strong administrative commitment.

Discussion of Findings

The findings suggest that while teachers generally appreciate and apply elements of culturally responsive teaching, there is room for growth in promoting active cultural participation and ensuring equitable access to culturally relevant instructional resources across Nigerian secondary schools. The findings also emphasize that culturally responsive instructional practices, particularly those connecting Mathematics lessons to real-life experiences and acknowledging students' cultural contexts are perceived as highly effective in promoting student engagement and achievement which is tandem with findings by Ayanwoye et al. (2025). Consistent with Oyeleye's (2025) findings, the variability in application of teaching practices highlights the critical need for

continuous professional development to achieve consistent and effective use of these strategies in all classrooms.

The perception that culturally responsive teaching improves student motivation, participation, and Mathematics performance aligns with findings from Cambaya and Sariana (2025). While some variability is evident, particularly in the application of relatable content, the consistently high ratings highlight the importance of embedding cultural relevance and real-world connections into Mathematics instruction within the Nigerian educational context. Findings indicate that improving Mathematics outcomes for underrepresented students in Nigeria requires a multifaceted approach, combining professional training, adequate resources, teacher collaboration, and proactive leadership support to ensure the sustainable integration of culturally responsive teaching practices.

Conclusion

This study concludes that while Mathematics teachers in Nigeria perceive Culturally Responsive Teaching (CRT) as crucial for improving motivation and performance among underrepresented learners, its effective implementation is hampered by inadequate training and resources. Therefore, achieving equitable Mathematics outcomes requires commitment to ongoing teacher support, curriculum adaptation, and resource provision to translate pedagogical agreement into consistent classroom practice.

Recommendations

Based on the findings of this study, the following recommendations are proposed to strengthen the use of culturally responsive teaching (CRT) practices in Mathematics classrooms for underrepresented secondary school students in Nigeria:

1. Regular professional development programs should be provided to equip teachers with culturally responsive strategies, including how to integrate local contexts, real-life examples, and students' cultural backgrounds into Mathematics instruction.
2. Schools and education authorities should ensure the availability of culturally relevant instructional materials and teaching aids that connect Mathematics to students' lived experiences.

3. The national Mathematics curriculum should explicitly promote culturally responsive pedagogy, while policies should encourage flexibility for teachers to contextualize learning without compromising assessment standards.
4. Teachers should collaborate through professional learning communities to share CRT practices, while schools should involve parents and local communities in supporting culturally grounded Mathematics learning.

References

Abdalla, H., & Moussa, A. (2024). Culturally responsive teaching: Navigating models and implementing effective strategies. *Acta Pedagogia Asiana, 3*(2), 91-100. https://doi.org/10.53623/apga.v3i2.432

Awofala, O. A. A., & Fatade, O. A. (2023). Nigerian students' poor performance in Mathematics: Who do we blame? *Nigerian Online Journal of Educational Sciences and Technology, 5*(1), 1-12. https://nojest.unilag.edu.ng/article/view/1713

Ayanwoye, O. K., Olofin, S. O., Salami, O. O., Omotoye, O., Akinwamide, C., Ayodeji, M., Ojo, A. A., & Monalisa, L. (2025). Culturally responsive geometry instructions in secondary school: Perspectives of in-service Mathematics teachers. *The International Journal of Diversity in Education, 26*(1), 1–25. https://doi.org/10.18848/2327-0020/CGP/v26i01/1-25

Bullock, J. H., Morgan, J. E., & Warner, W. J. (2021). Motivations and Challenges of Underrepresented Students Enrolled in Post-Secondary Agricultural Education Program: Community through Diversity. *Journal of Agricultural Education*, *62*(3), 185–201. https://doi.org/10.5032/jae.2021.03185

Cambaya, E. J. D., & Sariana, L. G. (2025). The influence of culturally responsive Mathematics instruction and students' sense of belonging on their attitude towards Mathematics. *International Journal of Research and Innovation in Social Science (IJRISS), 9*(5), 1550-1568. https://doi.org/10.47772/IJRISS.2025.905000123

Garba, A. (2024). Effects of ethno-Mathematics instructional approach and problem-based learning strategy on students' interest, achievement and retention in geometry in Benue State, Nigeria. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *15*(2), 65–89. https://doi.org/10.61841/turcomat.v15i2.14685

Hanna, G. (2002). *Towards gender equity in Mathematics education: An ICMI study*. Kluwer Academic Publishers.

Jacob, E. E., & Dike, J. W. (2023). EthnoMathematics and culturally responsive pedagogy in Mathematics learning. *Journal of Education in Developing Areas (JEDA) Special Edition, 31*(3), 1-12.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities**.** *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Lakhwani, M. (2023). Culturally responsive pedagogy: Exploring parent perspectives on American education. *Journal of Interdisciplinary Studies in Education, 12*(2), 178-188. https://www.ojed.org/jise/article/view/4299

Majebi, O. I., & Oduolowu, E. A. (2021). Correlational study of culturally-based instructional strategy and cognitive competencies on problem solving, speaking and listening: An Evidence in Oyo State Nigeria. *International Journal of Emerging Issues in Early Childhood Education, 3*(2), 28-41. https://doi.org/10.31098/ijeiece.v3i2.564

Monjaras-Gaytan, L. Y., & Sánchez, B. (2023). Historically underrepresented college students and natural mentoring relationships: A systematic review. *Children and Youth Services Review, 149*, 106965. https://doi.org/10.1016/j.childyouth.2023.106965

Niyi, O. O., Akpokiere, R. U., & Salihu, H. (2024). Implementation of indigenous language policy for basic science and Mathematics in Niger State, Nigeria: Challenges and prospects. *British Journal of Psychology Research, 12*(3), 23-31. https://doi.org/10.37745/bjpr.2013/vol12n32331

Oyeleye, B. O. (2025). Issues and prospects of equity and inclusion in the Nigerian education system. In *Educational thoughts, policy and practice: A multidisciplinary approach*. Faith International Printers and Publishers, Zaria.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2***,** 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Toromade, A. O., Orakwe, C. U., & Okonkwo, C. A. (2024). Equity-centered adaptive learning (ECAL) in Mathematics: Personalizing education for underrepresented groups. *International Journal of Applied Research in Social Sciences, 6*(11). https://doi.org/10.51594/ijarss.v6i11.1693

Uzoka, N. E., & Igwe, R. O. (2015). Quality and equity in Nigerian educational system: A panacea for economic empowerment, development strategy and social justice. In *The IAFOR International Conference on Education*. The International Academic Forum.