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# **Decolonising the curriculum in schools**

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## **Abstract**

The focus for this paper is anti-racist work in the national curriculum at primary and secondary school phases based on the context of English schooling. Anti-racism is defined as action steps whereby racial discrimination is minimised in the process of inclusion (Brown, 2021). Collaboration and exchange in Science, Technology, Engineering and Mathematics (STEM) developments, native and indigenous peoples' struggles against socio-environmental impacts can be discussed with children, with links made between racial and climate injustices. Critical Race Theory stresses that positive action since racial equity is most likely to happen when there the interests of those in power converges with those with less power. Through discussions with colleagues, student teachers, class teachers and children, I aim to tell the truth in these speech situations, communicative and dialogical acts. This highlights the undistorted and transformative potential of praxis which links theory and action within reciprocal relationships. From an anti-racist lens, critical race theory highlights that surface level meanings hide deep structural conflicts.

Tate captures well the dynamic of Critical race theory (CRT) when he describes it as “an iterative project of scholarship and social justice” (1997, p. 235). CRT emerged among a group of North American legal scholars, to explain how racial subordination persists within a system of ‘equal rights.’ They objected to the dominant academic and popular conception of racism. CRT accepts that within the context of the West, there is a dominant, mainstream view that places white people and whiteness at the centre. “*The heart and soul of the anti-CRT outburst is this anxiety of the changing protagonists in the story of American history*” Laats (2021). Critical theories are shaped by beliefs and values, privileging some over others. Reflexivity is essential here and as a teacher educator in this research, I challenge and question the established narrow and prescriptive UK national curriculum and

encourage a re-thinking of content. Using the theory of interpretivism and critical race theory's storytelling tool, a historical and cross-cultural model of mathematics aims to have positive outcomes of my work. We need to move away from an industrial view of mathematics and education, towards one based on helping children address the global challenges we face including inequalities, inequities, poverty, racial, social and climate justice issues. Wilson (2020) states: "*A real challenge is ...balancing the teachers' role in raising awareness of social justice issues through maths with empowering learners to be able to do something about these injustices.*"

### **Introduction**

The relevance of this research is situated in my professional journey. After ten years as a secondary school mathematics teacher, in city comprehensives in Nottingham, Bristol and Norwich, I moved into university teaching where I have worked with primary and secondary school student teachers. During my work in schools, I noticed how engaged pupils became when learning about the historical and cross-cultural roots of mathematics. As a result, over the last 15 years, I always include a session on 'historical and cross-cultural roots of mathematics' for PGCE secondary mathematics student teachers.

In Summer 2020, my PGCE mathematics students collaboratively wrote lesson plans on topics such as 'Tower of Hanoi', 'Sudoku', 'Game AYO', 'Yoruba numbers' and 'Chinese Tangrams'. In addition to this session and following the death of George Floyd and the global protests, I shared 'White Privilege' (McIntosh, 1989) and Smith and Lander (2011) on student teacher's views of ethnicity. My students discussed issues of diversity, racism, the national curricular and reflected on ideas for their own classroom practice. I was impressed by the rich discussion and their knowledges of the history of the civil rights movement, the Native American experience and history of colonialism.

The importance of this research stems from my parental influences in childhood which prioritised education. My father, Bhag Singh, graduated in mathematics from Punjab University in India, arrived in UK in the late 1960s, and worked as engineer for 58 years. His high expectations for me to go to university have been a key to my

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professional journey. My mother, Surinder Kaur, was a clever woman despite being denied schooling in a rural Indian village in the 1950s. In the UK, she worked for almost 40 years, with a strong Sikh faith and belief in service (Punjabi word - 'seva'). My parents worked multiple shifts and had a strong work ethic. My mother worked multiple shifts and was paid the minimum (paltry) wage. Despite the setbacks and barriers, she remained a strong Asian immigrant woman who was resolute in her mission to do the best for her children. I am dedicated to equal opportunities for all, making society fairer, and celebrating diversity as a strength.

### **Relevant literature on the issues**

Singh (2021) focuses on Fanon's emphasis on the industrial hierarchy of 'intelligence' and its' dehumanisation, with an education system producing inferiority and superiority. In school mathematics, there is a focus on instrumental reasoning which underpins management, corporate and governmental thinking. Following the murder of Stephen Lawrence and the MacPherson Report which highlighted institutional racism, Dr. Ajegbo provided a foreword to the 'Curriculum Review: Diversity and Citizenship'. This DfES (2007) publication included a list of 24 recommendations of 'Education for diversity' in English schools.

Bhambra et al. (2018, p. 2-3) refute that there is one definition of 'decolonising' and that it is inherently pluralistic with 'contested... and multiple character'. There are common elements, one of which is to "offer alternative ways of thinking about the world". The decolonising the curriculum movement has fostered support and action for change in schools and universities but has also met with pushback from the UK government. Decolonising the curriculum is about seeing and appreciating the world by ensuring that the views and voices of marginalised groups are heard and appreciated. Such an approach benefits all members of society.

The language of education policy reinforces the notion that 'mathematics is performative' through the repetitive use of the word 'rehearsal' in the recent government publication 'Research Review series: mathematics' (Ofsted, 2021). This places emphasis on a test-

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culture of education and one in which children 'perform' on assessments. This review has been criticised by The Association of Mathematics Educator and Teachers (AMET) for inaccuracies, leading to a complaint against Ofsted (ATM, 2021). The joint ATM (Association of Teachers of Mathematics) and MA (Mathematical Association) Primary Group have produced a practical guide for the classroom practitioner in responding to the 2021 Mathematics Ofsted Research Review (2021, p. 3):

*“In writing this response, we have engaged with the review and considered how the recommendations might translate into positive mathematical experiences for early-years and primary-aged children. Our hope is that this document stimulates thinking by educators and leaders about the nature of mathematics learning and teaching in their settings, and can act as a springboard for further practitioner research.”*

The prescriptive curriculum disempowers teachers and undermines their professionalism. The product is a narrowing of the curriculum and instrumentalism (Welch, 2009). The new reforms of the Core Content Framework (DfE, 2019) for initial teacher education courses, reinforce the transmission approach to pedagogy by its use of language. We can see this is the plethora of statements, for example: ‘Students should learn that...’ and ‘Students learn how to...’. Teachers and higher education providers are currently being urged to respond, through a public consultation, to the governments’ ITT Market Review (DfE, 2021) that views education as a business model rather than a life-long development. The current UK national curriculum for mathematics aims to ensure that all pupils:

*...become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.*

DfE (2021, p.99)

The national curriculum states that all students should have ‘memorised their multiplication tables up to and including the 12s by the age of 9’. Boaler (2015, p. 1) states:

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*“...many classrooms focus on math facts in unproductive ways, giving students the impression that math facts are the essence of mathematics, and, even worse that the fast recall of math facts is what it means to be a strong mathematics student...these ideas are wrong and it is critical that we remove them from classrooms, as they play a large role in the production of math anxious and disaffected students.”*

When taking mathematics questions under time pressure, stressed students cannot access facts they know (Beilock, 2011). The poet Michael Rosen, has formed a group in the UK to highlight the damage of policies in schools and the numbers of primary age children who now walk to school crying, caused by over-testing (Garner, *The Independent*, 2014). Mathematics anxiety has now been recorded in students as young as five years old (Ramirez, et al., 2013). When students are stressed, such as when they are taking mathematics questions under time pressure, the working memory becomes blocked and students cannot access math facts they know (Beilock, 2011; Ramirez, et al., 2013). Such experiences may turn students away from mathematics. Boaler (2015) remembers her own daughter starting the times three table memorisation and testing at age five in England, coming home and crying about mathematics. If we pressurise students to recall facts at speed, we will not erase the widespread anxiety and dislike of the subject that pervades the US and UK (Silva & White, 2013).

To reform mathematics teaching, we need to put less emphasis on examinations. I use a critical mathematics education lens (Ernest, 2021) to theorise a central idea of governmental policy driving a top-down approach to whole-school leadership, which in turn, has a rippling and hierarchical effect on departmental ethos. The consequences are a current system of education that embodies a business-like approach. Most people use algorithms in ICT and media without need for technical understanding and so mathematics serves as a social filtration device (Ernest, 2021).

Mathematics tests are a critical filter for entry to almost all higher education and professions. Ernest (2021) likens school mathematics as distillation process where children go into the assessment system and come out as either professionals (the mathematical elite), skilled, unskilled or the unemployed underclass. Those who are successful at mathematics are viewed to have overall success through improved life

chances. Numeracy is taught through primary school mathematics. Ollerton (2012) addresses the importance of teaching the interconnectedness of mathematics topics and the benefits of collaborative problem-solving for pupils. In my own experience, mentors have discussed the disconnect between school problem solving which is assessed individually in examinations compared to that in work environments where employees are expected to find solutions in teams.

### **Outlining, explaining and justifying the research design**

I have applied for ethical approval for a qualitative research project. It is anticipated that the research design will involve a partnership state school, initial teacher education university colleagues, student teachers, school-based class teachers, pupils, and parents in Yorkshire, aiming to address the following questions:

- 1. How can mathematics teachers decolonise mathematics national curriculum in England?**
- 2. What are the implications, for student teachers and partnership school colleagues, embedding anti-racist and decolonial practices in teaching?**
- 3. Why is it important to bring decolonial practices and anti-racist perspectives to children's learning of mathematics?**

In terms of context and participants, student teachers and school-based colleagues will be invited to participate due to interest in broadening their practice in the school curriculum since they may have not had any prior training in anti-racist practices. The development and implementation of our collaboratively created anti-racist curriculum with their pupils will require ethical clearance from school, university and written consent from student teachers, school-based colleagues, pupils, and their parents / guardians / carers. In the next section of this paper, I address the epistemological, theoretical and methodological issues of this study.

Through an anti-racist lens, participants will have ownership of innovative approaches and a practical enterprise of an inclusive

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curriculum. More recently, Brooks (2021) highlights Scottish teachers given guidance on decolonising the curriculum, including a package with advice on how to discuss race and normalise diversity within lesson subjects. Further, Adebisi (2021) discusses the demand from students for different types of curricula in the context of decolonising university law.

As Ollerton (2012) notes that as teachers we must connections between mathematics topics, when teaching children. This makes mathematics an ideal focus for decolonial approaches in terms of highlighting the interconnectedness of humanity. Possible national curriculum topics include:

- a. **Number** – origins of number, number systems around the world (Yoruba - African, Indian, Egyptian, Roman, Urdu and Arabic), Hindu and Chinese derivation of zero, base 20, Fibonacci and other mathematicians
- b. **Algebra** – Arabic origins, trade, finance – money, currency, taxes
- c. **Shape, Space and Measure** – art, tessellations, symmetry, Rangoli patterns, cathedral and Islamic designs, geometry, Celtic knots, Roman Mosaics, Egyptian pyramids and 3D, Vedic square and design, African patterns, Chinese tangrams, mazes
- d. **Data and Statistics** – critical maths education, gender inequality, literacy rates around the world, world statistics, population census, probability games around the globe – origins of chess, Towers of Hanoi
- e. **Problem-solving** – global warming, climate change, economy, politics, biodiversity and extinction, environment, natural resources, deforestation, recycling, technology  
chemistry, science and geography, sea levels and floods, forced migration, mining precious metals, STEM, ethics, ecosystems, pesticides, agriculture and farming, animal testing and pandemics.

Through planning of these topics, we can see links to critical mathematics education (Ernest, 2021) and realistic mathematics education (Kathotia, O'Brien & Solomon, 2021), for cultural and social

justice reasons. As Ernest (2021) states, we should discuss the ethics of teaching mathematics by using real world examples such as Covid, global warming, pollution of the environment, health, and mortality figures from around the world, statistics on gender and race inequalities.

Two sets of online resources created by staff and students at York St. John encompass ideas for films, books, podcasts, videos and research from a wide variety of school subjects were shared with Primary undergraduates in November 2021, and Secondary postgraduates in December 2021 as part as part of two Diversity conferences and a workshop on decolonial practice in education. Student feedback from these two conferences include the following comments:

***A lot of strategies and information regarding children from different ethnic minorities.***

***I have come away with a lot of strategies that I would implement in my teaching.***

***It has given me a deeper understanding of each group of people/children, and this has enabled me to think of ways to support them more effectively***

***...very useful and formative session, we are always aware of these topics but we need to push this and educate our students so they can carry it on in their journeys***

***In Music, we did a lesson on the slave trade to give context and an introduction to the origin of blues. I try to say "enslaved people/persons" rather than "slaves". thinking about the language I use. Advice on this told me that slave isn't an identity, rather a circumstance***

***This is showing me that I'm definitely not doing enough! I don't think diversity is really addressed in my lesson plans at all***

***Thank you Manjinder, loads to think about and packed full with excellent resources.***



Working with the schoolteachers and leaders, we will challenge the top-down and colonial approach that knowledge is transmitted in one direction. By providing children with opportunities to do their own research, facilitated by teachers, they create poetry and stories in a mutually beneficial learning experience. Cross-curricular links can be made to travel and geography. Also, using questions on, for example, the topic of Symmetry in the mathematics national curriculum, we can teach Roman mosaics to make connections to the history curriculum, enabling consolidation and a deeper level of understanding:

There is a plethora of resources available for primary and secondary school children on relating to Black History on, for example, BBC Bitesize website. The mutual enrichment of different knowledges and cultures is an important side of decolonising the curriculum so exploring more culturally diverse examples is key to the project. In STEM developments, the 'ecology of knowledges' (Santos, 2018, p. 371) is intrinsic to a holistic view with contributions from Black and minority ethnic people, such as Katherine Johnson and Ramanujan, to support classroom conversations.

The development of mathematical ideas, practices, concepts, and content from around the world will be a process of creating narratives about topics and planning lessons. For example, mathematical mazes are ancient and appear many times in history. According to ancient legend, Daedalus constructed the so called "Cretan Labyrinth" in Knossos, to house the legendary Minotaur. The Minotaur was a fearsome creature, half man and half bull killed by Theseus in the famous legend in which he escapes using a ball of string provided by Ariadne. Such stories and contexts can act as a 'hook' for children's learning, making connections between mathematics and history.

The decolonial approach is linked to critical mathematics education in terms of the holistic engagement with the social and cultural aspects of topics. As teachers, we do not need to rely on hammering drills and principles because children learn through stories and discussions about mathematicians and their work. By teaching world history from international perspectives, we will provide a western-based curriculum that is diverse and benefits all learners. We will tackle the myth of

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'learning loads of new content' since the process of deconstructing and reframing the national curriculum will give teachers the confidence as knower of complexities behind STEM developments to be more innovative and to take ownership of their own classes.

In Sikhism, a person is involved in human problems and society. Such a person lives with a mission and works for the emancipation of all. A true Sikh works for individual human rights, the environment, and justice for all (ARC, 1995). We are entering a new age, the rainbow is made of an infinite set of colours (Khela, 2021) and social justice should be at the heart of any university (Bhopal, 2021) By addressing social justice issues, we give mathematics education a holistic and global approach. For mathematics, this is crucial as we live in cultures as the subject is feared by many, causing anxiety (Boaler, 2015). Contributions from Black and minority ethnic peoples enriches the curriculum, across school subjects, to make learning interesting and engaging. Through this global approach we can teach people not to judge others by their skin but by their achievements. For example, Fibonacci numbers are named after the Italian mathematician Leonardo of Pisa, In his 1202 book, he introduced the sequence to Western European mathematics, although it had been described as early as 200 BC in Indian mathematics work by [Pingala \(3<sup>rd</sup> / 2<sup>nd</sup> century BCE\)](#) on patterns of Sanskrit poetry formed from syllables of two lengths.

Kodikara (2021) talks about her secondary schooling in the 1990s, where there was no learning about the British occupation, the British Empire slavery and colonisation. It is almost 500 years of the British colonising 23% of the world's population and those effects are still crippling today's societies. I learned about my own ancestral family's British history through conversations with relatives and self-study and therefore it is important that we make this compulsory education for all. Part of British history is slavery with Britain enslaving 3.1 million Africans; this education about slave traders is necessary, timely and relevant. We need to understand the justice issues between countries and why some are poor, having poor health systems and are in debt. Talent and creativity live everywhere, and we need to understand the background of these countries.

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The University of York's seminar on anti-racism (Jayawickrama, 2021) highlighted the need to be equal partners in the Global South, previously colonised countries and in the Global North. Collaborative thinking is based on survival and human flourishing where teachers are curriculum makers and co-creators of knowledge. This links to Japanese lesson study ideas in mathematics teaching (Swan *et al.*, 2015). Collective effort comes from creative collaborative solutions from below (Mbembe, 2016). According to Ubuntu, racism and colonialism diminish the racist and the colonialist. There is no 'other' in Ubuntu. Instead, we see the 'other' as not a threat but as a thinking knowledge-producing subject for social, economic, and environmental justice.

### **Epistemological, theoretical and methodological issues**

In this section, I align epistemologies, theories, approaches and strategies. Social constructivism is a theory of knowledge (epistemology). When teaching a Year 8 class, I was asked by a boy, "Miss, was mathematics discovered or invented?" My **philosophical assumptions** are that knowledge, including mathematics, is socially constructed. Mathematics has developed through time and is a language created by humans over thousands of years. I take a social constructivist approach, aligning with critical mathematics educators, viewing the subject as ethics- and value-laden (Ernest, 2021). Mathematics embodies aspects of the good, the ethical values of **openness** and **democracy**. We have ways of seeing theories, concepts and methodologies and represent the world through these tools. Truth is created by human acts. As a researcher, I view myself and other participants, as travellers on intersecting journeys rather than miners or extractors of knowledge.

This project is a historical and cross-cultural model of mathematics education which integrates different knowledges and practices together to develop the national curriculum. Content and curriculum where topics are grounded on a historical-epistemological stance which looks at mathematics as a dynamic and cultural development with knowledges and practices at national and global levels. Developments in STEM are epistemological. Social processes are central to the school topics in the primary and national curricular such as Number, Algebra,

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Geometry and Statistics where children's mind maps can encourage connections between these areas.

Adebisi (2021) poses 'What world emerges from an epistemic project based on colonial matrices of power – racism, sexism and nature?' 'Answer: More control over land'. Coloniality of power allows us to think through how the colonized were subjected to exploitation of all their resources and to a hegemony of Eurocentric knowledge systems (Alcoff, 2008). The knowledges beyond epistemic European were disqualified (Dube, 2009). Thinking in terms of the Amerindian *Pachamama* - the Mother Earth is a living system - may open the gates to the return of suppressed epistemologies such as those inscribed in Mandarin, Arabic or Aymara that were relegated to tradition from the conception of time and culture - that culture and time only started at the beginning of a colonialism. As Attenborough (2021) states, humans are part of nature and thus must live in harmony with the natural life if we are to survive. He has highlighted the need for all nations to work together, without this border thinking. *We need to learn from and with the epistemic South to promote an ecology of knowledges.*

Structuralism ([Heydebrand, 2001](#)) is an intellectual tendency that seeks to understand and explain social reality in terms of social structures. We can challenge these underlying structures so those who are disadvantaged by power can be emancipated. We know that reality is shaped by social, political, cultural, and other beliefs and values, and from a critical race theory perspective, these beliefs and values privilege some views of reality whilst under-representing others. Views are influenced by race, gender, and class (Kandal, 1995) and the complex ways in which oppression and disadvantage run across intersections of these.

Micro-processes of everyday life are inhabited by power; knowledge and truth are an effect of this power. By taking a critical approach to research, we recognise the partial and situated nature of knowledge, language discourse and social affairs which shape institutional practices and identities. For example, Guttstein (2012) uncovers the relations of injustice under the surface of societal arrangements and practices through mathematics teaching using the **statistical**

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**correlations between race and stop and search by police.** This transforms students' attitudes and achievements.

Decolonisation of school mathematics is a challenge which needs to be explored through the philosophy of mathematics education and the way the subject is portrayed. It is bound within the cultural contexts and values of its makers (Ernest, 1991a). The views of mathematics as a positivist subject are contradicted by critical mathematics educationalists. Ernest (2021) highlights mathematics as ethics-laden, for the betterment of students and democratic society. This affects mathematics and practice through the *professional ethics of mathematicians and mathematics teachers, ethics of mathematical applications and pure mathematics, and ethical impact of mathematics on society.*

For some mathematicians and philosophers, the claim that pure mathematics is ethics- or value-laden is problematic, however, from a social constructivist position, must be both as a human product. Pure mathematics embodies aspects of the good. Validity in mathematics requires display of means of verification (proof, calculation) publicly and openly. Mathematics grows through pure research based on a working mathematicians' virtuosity. *Growth of knowledge and culture improves human flourishing* and is thus intrinsically good. My philosophical stance is that this research is here to do good.

My values are promoted in this investigation through democracy and community. Since ethics is about justice, equality, fairness, law, and inclusivity, I shall need to gain Informed consent through the ethics application form. It is important to problematise everything, for example having a discussion on anonymity in the context of participants choosing their names and having no denial of their background and culture. This ethics approval will be a dialogical process, involving talking to a panel. I will require the cooperation of gatekeepers such as headteachers, governors, local authority, parents and carers and pupils and so seek permission from the community. Recording lessons has ethical implications of listening to and being sensitive to children's experiences. Hearing the voices of people from disadvantaged and

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marginalised groups is part of the process of this anti-racist and decolonial practice in education.

There will be no coercion to make people take part and participants will be given choice for follow-up contact details and interviews. The rapport of harmonious relationships on the insider and outsider continuum is like a pendulum encompassing empathy and kindness. There may be participants who wish to contribute to the research off-the-record. As an insider in this cooperative enquiry, I also an outsider of the high school environment and so need to consider my positionality and associated challenges, in terms of being aware of relationships and my reflexivity.

I also draw from the related 'participatory action research' that Bradbury (2021) discusses as including 'powerful love', bringing the feminine into action research, considering how knowledge is created outside higher education / academia and how we need to bridge this gap by co-creating knowledge as a collective. Freire (1972) engages in participatory action research for social justice and community development, highlighting that collective knowledge and actions are necessary for transformation. Knowledge is created with people and not transmitted to them which is the shift towards a decolonial practice of bridging the dialogue between all participants, from the bottom-up. We raise conscious awareness of the masses to improve people's lives with human inquiry based on energy and practical opportunity for impacting practice.

Conceptual strategies in Critical Race Theory include storytelling and counter-narratives that challenge dominant narratives, empower marginalised groups and are central to informing action. Gillborn (2006) argues that such counter-narratives shift the grounds of debate and present analyses that turn dominant mainstream assumptions on their head. We can use storytelling in teaching mathematics with respect to the historical and cross curricular roots. This integrated strategy supports the planning of the mathematic topics in a story-telling nature, akin to critical race theory. We can learn through stories and discussions, with feedback from children, mentors / class teachers and student teachers to be analysed. I choose to tell rich and credible stories in the complexity of this social world (O'Reilly, 2012).

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**Concluding remarks**

I aim to interpret and explain the complex and highly contextualised phenomena of decolonisation of the national curriculum for anti-racist teaching. Multiple analyses and resulting interpretations are integrated into a coherent, compelling, well-organised and adequately supported account provided by critical race theory and anti-racism in educational theory and praxis. Critical theory offers a flexible approach to enquiry with inter-and multi-methodological approaches which can be changeable and adaptable. We will interweave observations, interviewing, data and thematic analyses. Richly textured accounts of complex social phenomena and narrative techniques will be used to make arguments. By constantly revisiting my own preconceptions and interpretations around the experience, I shall consider reflexivity. I am more interested in being true, real, trustworthy, practical, genuine, and authentic rather than in the research's validity and generalisability.

Critical race theory puts racism at the centre of analyses by rejecting and deconstructing patterns of oppression and exclusion. Data analysis will be done through a descriptive-interpretative approach, looking for differences and connections within the curriculum work. We will plan, teach, learn, and reflect to inform a multi-layered understanding of how the development and implementation of this curriculum develops. The research design will involve exploring and interlinking data from different stages and from different perspectives of the participants. Data collated through one method will be linked to other sources, for example, lesson observation notes will be connected to conversations with participants. Exploration of different layers of experience will be linked through different school subjects.

By including broader and more global perspectives in schools, we can teach philosophical and social developments in science, technology, engineering, and mathematics for holistic engagement. By teaching pupils to see mathematics as ethical, we teach critical citizenship to future *politicians and business leaders* such that it socially and politically empowers students (Ernest, 2021). We can work towards curriculum content and topics which look at mathematics as a dynamic and cultural development. Mathematics has everything to do with a new revolutionary world order which is urgently needed as humanity faces

the existential crisis of climate change. Our hopes for the future depend on learning the lessons of the past, teaching ethnomathematics (Skovsmose, & Vathal, 1997), realistic mathematics (Kathotia, O'Brien & Solomon, 2021) and critical mathematics education practices.

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