Decolonising secondary Maths initial teacher education in England

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Abstract

In England, a crisis in teacher recruitment and retention is negatively affecting the teaching of Maths. This is particularly damaging for children from working class, global majority and low-income households – qualifications in Maths being important in the employment market and for some Degree level subjects. The current shortage is framed by a proliferation of school-based Initial Teacher Education (ITE) pathways outside of Higher Education (HE) and a recent Market Review of HE-based ITE that signalled the introduction of a centrally prescribed ITE curriculum.

This article draws on research into a mature HE-based secondary Maths Post Graduate Certificate in Education (PGCE) programme in a 'superdiverse' city in the West Midlands of England to offer insights into an alternative partnership approach. Through analysis of data from focus groups and semi-structured interviews, the paper utilises theories of decoloniality and critical pedagogy to argue that current policymaking, rooted in coloniality, underpins the current crisis. Key findings show how HE-based ITE, in partnership with schools and informed by critical pedagogy and an interest in the public good, has infrastructural advantages over school-based programmes. In this case, partnership as an organic, networked collective significantly benefits students and the local communities they come from.

Key words: Decolonial Theory, Maths Teaching, Initial Teacher Education.

Introduction: terminology
In this article we use the lenses of decoloniality and critical pedagogy to provide insights into the current situation in Initial Teacher Education (ITE) for Secondary Maths in England, drawing on research into a PGCE course in a post-92 University in the West Midlands. Our aim is to contribute to the debate and inform future policy on ITE in relation to the effectiveness of HE-based (specifically Maths) ITE. The paper will provide insights into how an ITE course can challenge systemic inequities that privilege some bodies over others and define excellence as responding to (minoritised) community needs. In doing this, we adopt a theoretical focus that speaks to the experiences of students from global majority and working-class backgrounds.

In this article, we use the term 'global majority' in problematising deficit language categorisations related to race. While we realise that terminology in this area is contested, the providence of this term influenced our decision to use it as it aligned to the context of our study. Rosemary Campbell-Stephens first coined the term in her work on a black-led leadership programme in the schools-sector in London between 2003-2011, as a move towards 'liberating and empowering' language use. Campbell-Stephens elucidates her definition of the term, which currently represents 80% of the world's population, as:

'a collective term that… encourages those so called to think of themselves as belonging to the global majority. It refers to people who are Black, Asian, Brown, dual-heritage, indigenous to the global south, and or have been racialised as 'ethnic minorities' (Campbell-Stephens, 2009, 322).

This term also signals a direct link between Britain's colonial past and the racism experienced by teachers in British educational institutions currently (Gillborn 2008). We also prefer the term 'actor' rather than 'participant' as we feel it positions people in a vocal and empowering way as opposed to a potentially passive positioning.

Policy context
We start with an overview of the UK policy context in which recruitment and retention of Maths teachers has become especially problematic in secondary schools and further education colleges (NFER 2023, AoC 2022). Concerns about Maths education in England (as distinct from other UK countries) have been heightened by unfavourable international comparisons of attainment through the OECD's Programme for International Student Assessment (Gibb 2015). Strongly influenced by a competitive global market economy, current government policy sees low levels of numeracy and poor Maths skills as "a direct drag on UK productivity" (Heywood cited in National Numeracy 2018, 10). England's low attainment in Maths has been a trigger for repeated policy initiatives founded on a view that Maths is fundamental to a productive future workforce (BIS 2016, Smith 2017). For example, in April 2023, Rishi Sunak, UK Prime Minister, called for a "change (in) our anti-Maths mindset… to boost growth", and a: "change our education system so it gives our young people the knowledge and skills they need – and that our businesses need – to compete with the best in the world" (Prime Minister's Office 2023). This paper will elucidate how policy in response to this marketised context has strengthened racialised education structures that disadvantage students from global majority communities.

In the last decade and as part of an emphasis on a 'knowledge-rich' approach to school curricula (DfE 2021), there has been increased specification of content in Maths, influenced by educational metrics from East Asian comparators, particularly Singapore and Shanghai. 'Mastery' and 'teaching for mastery' have become 'dominant in the marketplace for mathematics teacher professional development in England' (Boylan & Adams, 2024, 254). Centralised policy interventions such as this have been made possible by a reshaping of the English education landscape contingent on marketisation, the championing of free schools and academies (Ball 2008, 2009) as local schools are pitted against each other in recruiting students and staff. Echoing developments in other parts of the global policy landscape (e.g. in Australia, see Rowe and Skourdoumbis 2019), ITE in England also faced increased provider competition. A range of different routes into teaching (e.g. *Schools Direct*, *Teach First*) largely external to HE, based in schools and centred on school-led networks continue to 'deliberately challenge the role of universities in teacher education' (Furlong 2012, 31).

Market competition and regulatory control of HE providers underwent a step-change with the Higher Education and Research Act 2017. The Act was introduced with a commitment to "extend access to higher education" and to "level the playing field" with the Office for Students (OfS) as a central regulator. A key aspect of this marketisation was the introduction of a data infrastructure that enabled the "appropriation of student data for purposes of accountability assessment… reinforcing metric practices of performance comparison, evaluation and ranking that… reframe HE as a competitive market" (Williamson 2019, 2796).

The Market Review of ITE launched in January 2020 – despite many objections from HE providers (e.g. University of Oxford 2021) – evidences the government's determination to

prescribe ITE curricula. To address the recruitment issue, the government introduced financial incentive schemes such as the 'Maths Golden Hellos' in 2014-15 and more recently, 'Early Career payments' for Maths teachers (DfE 2019a). Concrete evidence of the positive impact of these schemes is, however, lacking (DfE, 2019b). In addition, indications of the negative racialised impact of market reforms appear to have been ignored. An ongoing concern with the quality of Maths learning and teaching (Ofsted 2008, 2012) fuels the crisis in the recruitment and retention of teachers as, in the UK, 'exit rates are far more severe' than in other subjects (Sibieta 2020, 5). One consequence of this is that schools in disadvantaged areas are less likely to have qualified Maths teachers, leading to the deployment of such staff to teach 'year groups where the external stakes are high: GCSE, A-Level and GCSE retakes' (Allen and Sims 2018, 5, NFER 2023).

The course this paper focuses on draws students from global majority backgrounds and/or low-income households, that is, from communities whose existing disadvantage market-driven policies appear to have compounded. In ethnically diverse urban settings such as the one this study centres on not only is it less likely for schools to have qualified Maths teachers, but under-representation is an additional vexed issue. According to Tereshchenko et al (2020, 9) on average only around 10% of staff in West Midlands schools are from global majority backgrounds. The same study provides insights into the retention issue, identifying how teachers from global majority backgrounds often moved school or left teaching due to overt or covert racism: feeling their career progression was being thwarted, seeing others promoted above them and/or the 'toxicity' of their working environment. While there is evidence of "the low achievement of some ethnic minority groups" (Demie and See 2023, 1), this context points up the importance of recruiting (and retaining) teachers from global majority backgrounds while also highlighting the failure to date of policy to increase representation (e.g. DfE 2018). This paper argues that a market-driven focus on performance metrics has exacerbated a nation-wide under-recruitment of students from global majority backgrounds. Further, it proposes that ITE courses that take account of systemic racism in UK education in their recruitment practices and balance entry qualifications with broader considerations and a decolonised curriculum, present the best possible solution to these issues. It concludes that HE ITE is best placed to provide the holistic programmes needed to counteract the racialised impact of existing market-driven policies.

Rationale for study and research questions
The rationale for the study is multifold. First, it is premised on challenging the school-based modes of delivering ITE as favoured by UK government policy for the last decade and half. It contends that HE-based ITE in partnership with schools is better placed than school-based routes to recruit, nurture, develop and ultimately retain teachers in the profession. A key difference between school-based ITE programmes and HE provision is that school-based ITE involves more or less total immersion within the school workplace from the start. HE provision is more arm's-length, centring on an HE environment that offers theoretical insights and reflection external to school settings, complemented by periods of 'placement' within schools. In both types of provision, students are supported by mentors. In this course though, many of those mentors were course alumni and from the same backgrounds as the students they mentored. This was another feature orientated towards the tackling of any issues arising related to race or racism.

In the case of our study's superdiverse city in the UK, this is also about providing Maths teachers who positively represent the backgrounds that the children come from, i.e. Black and Asian heritages. Secondly, the study demonstrates how taking a decolonial approach to ITE and utilising critical pedagogy ensures that a much more inclusive ITE curriculum is

provided that offers extended support to counteract the key issue identified in the literature of the overt and overt racism students may face in schools and in turn supports and retains racially minoritised student teachers.

One of the key foci for this study was the recruitment of minoritised student teachers: an exploration made necessary by a context in which successive policies addressing diversity in the teaching workforce have seemingly failed. Demie and Huat See (2023, 3) identify a 'growing mismatch between the ethnic diversity of the pupil population and that of the teachers in their schools' and link this to underachievement in Black and Asian children. Drawing on a range of evidence, Sharp and Aston (2024, 4) provide further detail: '60% of schools in England had an all-White teaching staff in 2021/22' and pinpoint a key issue as 'the low acceptance rates of ethnic minority applicants onto ITE programmes compared with their White peers'. In addition, they find that retention for black and brown teachers is also 'significantly lower' than that of their white counterparts despite being 'over-represented among applicants who want to make teaching their career' (35). Drawing on multiple data sources, Worth et al (2022, 4) provide further insights into career progression for the students from these backgrounds and conclude that people from most ethnic minority groups and at most stages of their careers are 'less likely to progress to the next stage compared to their white counterparts.'

We wanted to explore the features of the PGCE course that impacted on and improved retention and completion of future Maths teachers from global majority backgrounds. With our knowledge of the demographics of the course, the research question we started with was:

> *How did the Maths ITE team address issues of under-representation in and through pedagogical approaches?*

The ITE team explicitly espoused critical pedagogical approaches in their focus group and this seemed to provide a strong axiological foundation that, additionally, was supported by theories relating to the decolonisation of the Maths ITE curriculum. After the data gathering, this led us to move towards a conceptual framework that combined the complementary lenses of critical pedagogy and decolonial theory. Listening to actors' voices, we found that a decolonial framework was useful in analysing the responses as this would properly foreground the voices of an ethnically diverse cohort. This approach also helped us to understand how an ethic of care practised worked to support and retain the student teachers in sometimes unsympathetic school placements. At this point, to take account of the ethnic diversity of the cohort as a significant feature and to reflect the schools where many of the student teachers were placed and went on to work in, we reformulated the research question to incorporate these insights:

> *How did the course respond to the current market-driven landscape of Secondary Maths ITE in England to address global majority under-representation through recruitment and pedagogical approaches?*

After presenting an overview of literature relating to Maths ITE with a focus on the experiences of student teachers from global majority backgrounds, we explain our underpinning theories and outline the research design. We then present our findings and analysis and open a discussion of how this HE-based provision, as an example of Maths ITE, challenges school-based routes in the wider ITE policy context.

Race, recruitment and retention in Maths ITE
In the UK context, Benson (2019) refers to an increase in teachers from widely diverse backgrounds as presenting positive opportunities for intercultural learning. Benson also identifies how these teachers' experiences of racism are likely to impact on retention and

proposes that school communities need to 'provid(e) a useful avenue for developing institutional diversity policy and diversity training in ITE' (2019, 9) through mentoring support.

Tereschenko et al (2020, 14) also see the retention of staff from global majority backgrounds as being affected by their relations with White staff:

> teachers were happiest in those schools where they felt valued, respected, had autonomy, connection with, and support from, colleagues and senior leaders, and clear paths for career progression.

Both Glassow (2024) and Gossoway (2024) enrich this picture, seeing appraisals and performance-based accountability as impacting negatively on staff retention and in Glassow's words on "the attrition of teachers in socioeconomically disadvantaged or 'hard-to-staff' settings" (2024, 276).

This literature foregrounds a critical gap in policymaking regarding Maths recruitment and retention of staff from these backgrounds: we propose that affective and spatial/embodied understandings of the lived experiences of global majority student teachers in ITE are vital in addressing the root causes of these issues.

Affective experiences and Maths student teachers
From a decolonial perspective, 'lived experience' signifies how the past haunts the present and shapes it in multiple ways (Kaur, 2023). With reference to negative past experiences, lived experience comprises both 'the now' and how 'the now' conjoins with and/or creates a (positive) rupture with the past. This conceptualisation communicates the attritional qualities of experiences of everyday racism, not least in education and how it may remain unacknowledged by teachers in White spaces. Kaur's (2023) research centres on the experiences of four women from global majority backgrounds in an urban neighbourhood in the West Midlands of England. Kaur's work illuminates their positive educational memories and the key role of teachers as 'spatial facilitators' outside of the formal curriculum. Kaur suggests that in some instances 'educational space was more than a colonising process; it was a space that began to feature more meaningful connectivity with student identities which affected how they thought and related to their environments' (2023, 15-16).

The affective impact of schooling experiences generally seems to be intensified in Maths as a subject, suggesting a deep entanglement with intersecting socially constructed identity markers. When framed by race, affective responses would seem to take on even greater significance for student Maths teachers or early career teachers (ECTs). McLeod's (1992) work established a theoretical model of the affective domain in Maths teaching and learning that foregrounded three main inter-connected aspects: beliefs, attitudes and emotions. More recently, Pipere and Micule (2014) considered such affective influences as contributing to a dynamic set of life-long relationships with Maths. The literature suggests a repetitive cycle in which negative prior experiences influence student decisions on whether or not to become Maths teachers. The teaching of Maths by non-specialists may contribute to this cycle.

Policy interventions that prescribe a universalised approach are an additional problematic factor. Teaching for 'mastery in Maths' has its precursors in the UK context, including in the early 2000s, the National Numeracy Strategy (DfES, 1999). Brown et al. (2004) comment on how while this gave teachers a discourse that was useful, it also hindered the development of critical perspectives on the Maths classroom. In many ways, this presages the current context when they warn about the dangers of centralised policy constraining the development of Maths teachers' localised practice 'through ever more visible surveillance instruments' (Brown et al

2004, 22). Consequently, they propose a shift of focus in Maths education research towards local, individual and collective understandings. Implicit in this is the suggestion that support for Maths teachers needs to be informed by classroom practice connected to local collective networks and supportive relationships.

The future development of Maths teacher education
Literature stressing the importance of partnership is extensive (e.g. Edwards and Mutton, 2007; Furlong et al., 2006). Darling-Hammond writing from the highly racially segregated US context (2006), identifies the importance of HEIs nurturing 'close, proactive partnerships with schools' (Darling-Hammond, 2006, 1) in a 'mutual transformation agenda (2006, p. 3).

While coming from the US context, these points relate directly to this study focused on an HE-led course sustained through partnership with numerous schools. As we will see however, there are significant tensions between partnership arrangements and the pressures created by a marketized ITE architecture. There is also extensive literature (e.g. Hobson et al., 2009; Cunningham, 2007) on the importance of mentoring, noted by Benson (2019) as a key tool in increasing the retention of staff from global majority backgrounds. We will go on to argue that the axiological underpinnings of these features rather than the features themselves provide the key to understanding how they impact on completion and retention and how critical pedagogy and decolonial perspectives are necessary adjuncts in superdiverse contexts.

Setting the theoretical scene: decolonial theory
The demographic profile of students at Coppleton City University (pseudonym) being around 50% global majority background and a similar proportion coming from low-income households together suggested a theoretical orientation able to explain phenomena rooted in the lived experiences of this demographic. Responding to this, we fixed upon a combination of decolonial theory and critical pedagogy to provide a conceptual framework that we believed could help us make sense of the data and become a stimulus for productive/necessary change.

Critical pedagogy responds to this context, being founded on a recognition of the deep structure of classism and racism (Delgado and Stefancic 2017). Critical pedagogy (as interpreted by, for example, Freire (1995), hooks (1994) and Giroux (2011)) asserts the dignity of the learner and fosters a critical consciousness of how education can be used to challenge social inequalities. As we will detail, the course also counters the realignment of individualised subjectivities that neoliberalism proposes, in its orientation around 'an identification with a collective and emancipatory political subject' (De Lissovoy 2018, 202).

Critical pedagogy and decoloniality share an insistence on the need for hope and the need to imagine other possible futures and ways of being and knowing in the world (Bagga-Gupta 2024). But there are other ways in which decoloniality can be viewed as a necessary complement to critical pedagogy. Accusations that critical pedagogy, rooted as it is in Critical Theory, is western-centric, has failed to recognise this and risks silencing indigenous, decolonial and subaltern thought (Spivak 1988) support complementarity. Proponents of critical pedagogy recognise this. For example, Monzo and McLaren (2014, 519-520) acknowledge the importance of a heightened consciousness of the epistemic subject:

> 'part of today's epistemological subalterity requires among critical educators the recognition and remembering of a history of oppression that has resulted in new forms of knowing and seeing, an episteme of resistance resulting from the need for survival amidst poverty, hunger, alienation, war, anger, pain and humiliation…'

While there are voices espousing radical decolonial thought that question who has benefited from what is perceived to be the Eurocentric (white) tradition of criticality (e.g. Harney and

Moten 2013), others see Critical Theory as sharing practices of critique, resistance, struggle and emancipation with indigenous knowledges (e.g. Smith 2001, 228). Like Fujino et al. (2018, 71), we acknowledge that 'universities are built upon cultural structures, epistemologies, and assumptions that retain characteristics of the colonial project' and seek a generative combination of critical pedagogy and decolonial thought in our recognition that, as McArthur puts it, decolonisation is a 'core struggle of this age' (McArthur 2022, 1682). Decolonial theory connects a rich seam of perspectives on the lived experiences of black and colonised people from around the world (e.g. Thiong'o 1986) with a more recent body of theoretical work on colonialism, postcolonialism and decoloniality (e.g. Harney and Moten 2013, Mbembe 2017, 2019). Within this, what is meant by coloniality is important. Ndlovu-Gatsheni (2013, 38) presents it as a cultural residue:

> Coloniality… refers to long-standing patterns of power that emerged as a result of colonialism, but that define culture, labour, intersubjective relations, and knowledge production well beyond the strict limits of colonial administrations.

Expanding this, Mbembe sees colonialism as engendering patterns of thought and systems of organisation that result in:

> 'This scission of humanity into 'useful' and 'useless'… with utility being essentially measured against the capacity to deploy a labour force' (2016, 12).

It is this objectification and categorisation of people(s) into those of inherent worth and those of none that colonial thought rests upon and that connects with patterns of subjectification prevalent within neoliberalisation. This 'scission', deemed political and economically essential in imperial contexts, also enabled the establishment of the current neoliberal economic and political order operationalised through marketisation that continue to drain material and intellectual resources from the Global South through the logistics of coloniality (Hickel et al 2022).

Mbembe sees colonialism as the establishment of a systemic and cultural patterning of relations in which one social group objectifies and exploits others – usually within a matrix of economic gain (2016). This perspective enables engagement with intersectional theory (Crenshaw 1989) acknowledging social class and gender amongst a range of potential categories of Other. Mbembe's perspectives on the postcolony see the overt violence of colonial rule being replaced by an ideological regime of violence (2001, 102) maintained through a set of authoritative ideas and values that he refers to as the *commandement*:

> The *commandement* seeks to institutionalise itself, to achieve legitimation and hegemony… The signs, vocabulary and narratives (it) produces are… invested with a surplus of meanings that are not negotiable…. The basic goal is not just to bring a specific political consciousness into being, but to make it effective (2001, 103).

Mbembe's recent work insists on the necessity of redefining what we mean by democracy: rejecting the abstraction of (Western-centric) universalism in favour of promoting 'a relation of co-belonging and sharing' that he calls 'the in-common' (2019, 40).

The direct relevance of decolonial theory to this UK study is clarified by Danewid's article (2019) on the 2017 Grenfell Tower fire. Danewid positions the fire in a West London residential housing block that killed eighty-six people, most from global majority backgrounds, within a history of British colonialism and racism. Her interpretation of the event centres on a re-reading of Empire in which the 'global city' (like the one in which this study is set) has become a 'node of colonial extraction' (Danewid 2019, 16). According to this perspective,

post-Empire, neocolonial power has turned inwards in a governmentality that reflects a mind-set and values derived from coloniality: specifically ideas about race, social class, social status, intelligence – ideas that plug into the meritocratic hegemony that is a feature of market fundamentalism (Sandel 2020) and neoliberalism (Littler 2019). This signals the development of a form of globalised governmentality premised on the management, measurement and exploitation of populations, with education playing a key role in the reification of social division and inequality (Hickel 2016).

Within decolonial literature is a strand focused on education and specifically on HE (e.g. Bhambra et al., 2018). The imperative to decolonise HE curricula has been signalled by data from the Office for Students revealing a significant 'awarding gap' between undergraduates from white and global majority backgrounds (e.g. OfS 2021). This data, alongside statistics revealing the marginalisation of academics from global majority backgrounds (see Bhopal 2020), highlights an 'epistemic injustice' (Fricker 2007) in HE curricula. It has also triggered scholarly activity that foregrounds the everyday lived experience of HE students from global majority backgrounds (Pryce-Miller et al 2023).

Research context & methodology
We approached the Maths ITE course as a 'case' both unique but also 'ordinary' and therefore capable of shining a light on common issues. To explore our research actors' perceptions of the Maths PGCE course including views on the issues of recruitment, course completion and retention, our research design needed to focus on different levels. This necessitated scrutiny of the mix of governance through the interplay of hierarchy, government policy intent, competitive market pressures and the improvisation of local implementation networks – in this case through partnership arrangements.

At the macro level, the HE-based leadership of the partnership and its mediation of externally imposed constraints on course organisation were key areas. At the institutional level (Mirza 2018), in this case in relation to recruitment, we needed to investigate the parameters for accepting prospective students onto the course. A third area looked at pedagogy – the extent to which student biography, prior educational experiences and ethnic background were allowed to inform teaching and learning and assessment practices.

Research Design

The research comprised two phases. Following ethical approval from the Faculty Ethics Committee, to gather a range of views from different stakeholders, we started with students and worked outwards through the teaching team and into the school partnership. In Phase 1, in February 2020, two face-to-face focus groups were held. The first focus group was conducted with nine student teachers from the 2019/20 cohort of Maths PGCE, with seven of them from global majority backgrounds (see Table 1). Alongside this, two observations of ITE sessions took place. The second focus group included three members of the Maths ITE team at Coppleton City University who are all from non-global majority backgrounds: a former headteacher and Maths educator, a former head of Maths, and a Maths educational consultant who continued to work in this role alongside his ITE role. The latter two 'home-grown' team members had both been students themselves on the course. Both focus groups took around one hour and were carried out face-to-face – prior to COVID-19 restrictions being announced.

Phase 2 comprised four semi-structured online interviews in May-June 2020 (during COVID-19 restrictions) across three secondary schools from the West Midlands partnership. Those interviewed included a Maths placement mentor, two heads of Maths, and a headteacher: all apart from the headteacher being from global majority backgrounds.

As well as interview/focus group transcripts, the research data included field notes taken both contemporaneously as well as reflections added immediately following the interviews sometimes emanating from our researcher conversations. All names of actors and settings are pseudonyms.

Table 1. Details of actors and settings

Actors	Stakeholder role	Method
Phase One (ITE context))		
1. Male (Vietnamese)	Maths ITE student	Focus Group 1
2. Female (White British)	Maths ITE student	Focus Group 1
3. Female (Algerian)	Maths ITE student	Focus Group 1
4. Female (Indian)	Maths ITE student	Focus Group 1
5. Female (White British)	Maths ITE student	Focus Group 1
6. Male (Pakistani)	Maths ITE student	Focus Group 1
7. Male (British-Pakistani)	Maths ITE student	Focus Group 1
8. Female (Pakistani)	Maths ITE student	Focus Group 1
9. Female (Libyan)	Maths ITE student	Focus Group 1
10. Male (White British)	HE ITE tutor	Focus Group 2
11. Male (White British)	HE ITE tutor	Focus Group 2
12. Male (White British)	HE ITE tutor	Focus Group 2
Phase Two (schools context)		
13. Male (British-Pakistani)	Maths mentor	Interview
15. Male (British-Pakistani)	Head of Maths	Interview
16. Female (Iranian)	Head of Maths	Interview
17. Female (White-British)	Head teacher	Interview

Focus group and interview questions

In terms of the types of questions asked, FG1 with the Maths student teachers included questions based on personal experiences with Maths education, reasons for choosing the Maths ITE course at Coppleton City University, examples of challenges and support from both the ITE and school placement contexts, extent to which they saw themselves as part of a Maths community network, and personal progression goals. One set of questions focused on exploring racialised aspects of Maths teacher education: 'for those from a global majority background – to what extent do you feel that global majority Maths teachers are under-represented? Why do you think this is? How has that affected your progress and your view of yourself as a Maths teacher?' FG2 included: perspectives on pre-existing barriers; challenges and support mechanisms connected to recruitment and retention; strategies to develop mentoring, networks, and professional development opportunities; and personal approaches and perspectives on the future of Maths ITE. Again, one question focused on a racialised aspect: 'How are the BCU Maths ITE team addressing issues of under-representation in the recruitment and retention of global majority Maths teachers?'

For the Phase 2 school-based interviews, questions included generic questions on personal journeys as a school or Maths leader, views on challenges and support in retaining Maths educators, perspectives on Maths policy, as well as tailored questions according to the specific roles, such as for the headteacher a question on the school community (including global majority representation), and for the Maths leaders and mentors a question around global majority representation: 'to what extent do you feel that global majority Maths teachers are

under-represented? Why do you think this is? How has that affected (or not affected) your career progression?'

We acknowledge the study has methodological limitations. Being unfunded research, we were unable to deploy decolonial research methods e.g. photovoice or case studies of individuals. More studies are needed to continue this critical dialogue.

Data analysis and findings
We began the analytical process by focusing on features in the literature that we saw as connecting with the course context (including recruitment and retention). However, a decolonial approach suggested that, rather than be restricted by a policy focus on recruitment and retention, we needed to identify the qualities and features that we felt were a part of the course's distinctiveness within the Maths ITE landscape.

Influenced by Braun and Clarke's (2023) thematic analysis (TA) approach, we went through a process of detailed textual coding of the focus group, interview, and observation data, and then organised similar themes through colour coding as a way to identify, analyse and draw out key themes or patterns within the data. Within this, our decolonial theoretical approach required us to remain conscious of our researcher subjectivity. Braun and Clarke's distinction between little q and Big Q researchers was useful in this regard, with them referring to the latter as adopting reflexive, non-positive TA approaches which 'embrace researcher subjectivity as a resource for research' that 'view the practice of TA as inherently subjective, emphasize researcher reflexivity, and reject the notion that coding can ever be accurate—as it is an inherently interpretative practice, and meaning is not fixed within data' (2023, 2).

As two white researchers using the theoretical lenses of decoloniality and critical pedagogy, we were also mindful of the need to advance an 'active, anti-racist, anti-colonial' positionality (Mackinlay and Barney 2014) and within this 'to ask a different set of questions and re-imagine educational research, practice, and policy' (Shahajan 2011, 199). This requires an examination of our whiteness, or in Freire's (1995) terms, our 'conscientização' and a mindfulness of Kovach's (2015) injunction that non-indigenous researchers commit to ongoing work to examine whiteness and power, with this work rooted in the desire to decolonise both the mind and the heart. Mindful that the research is small-scale, we foreground students and staff's lived experiences (Wong et al 2021) to contrast with the de-valuing of empirical data and diminution of the affective aspects of teaching and learning that characterise government orthodoxies. This, we believe, alongside a critical perspective on the structures that influence course delivery, offers an original contribution to knowledge.

Our analysis began with insights into issues affecting recruitment and retention but positioned these in relation to the global majority cohort. The combination of critical pedagogy and decolonial theory enabled a perspective capable of taking in both structural features and lived experience related to ethnicity and facilitated an analysis of the relationship between them. Whilst we had several interconnected themes, for this article we have chosen two superordinate themes to focus on. Responses to policy (Theme 1) emerged as a key theme because structurally the course is so different from prevalent school-based routes. Critical pedagogies to support diversity in the Maths teaching workforce (Theme 2) suggested itself as the second main theme because it focused on the pedagogical practice and underpinning values of the course. Within these themes we identified sub-themes that enabled a more granular analysis. These included: policy mediation (Theme 1a), disrupting Newly Qualified Teacher (NQT) policy (Theme 1b), teaching as a collective (Theme 2a), and pedagogies of hope (Theme 2b). In what follows we present findings and interpretation alongside each other.

Theme 1a: mediating ITE Maths policy in the partnership

Various aspects of the data evidence the course team's skilled mediation of the complex interplay of centralised versus local pressures of governance in the marketized ITE landscape – an environment that has signally failed to address the under-recruitment and low retention rates of global majority teachers. Coloniality here could potentially be seen to reside in the *commandement* of market-orientated provision that pits different institutions and pathways against each other and in which admissions staff, being conscious of performance metrics, recruit mainly or only highly qualified students without questioning how qualification profiles may be shaped by systemic racism. This results in a cycle in which students from global majority backgrounds are under-recruited (despite their over-representation as applicants). The course team challenged this through a radical deviation from standard recruitment practices. While the highly selective, two-year pathway in the UK called *Teach First*, requires the achievement of a first degree of a high standard, this course team actively recruited 'non-traditional' students:

> *They come with very weak subject knowledge. Many of them have English as a second language and their written skills… [can] create major problems with them writing assignments at HE Level 7… Some have been labelled as failing in Maths at school…*

As such, the course can be interpreted as positioned in a space *produced* by coloniality but its deliberate engagement with the "useless" identified by Mbembe (2016) seeks to subvert the colonial *commandement*. Course recruitment here challenges the deficit labels attached to these student teachers as 'high-risk' for the institutional metrics of retention and longitudinal educational outcomes that carry such weight in a marketized setting. The principle underpinning this connected with a longer term, collective view on the part of staff of Maths ITE as a socially situated endeavour: the course being seen as a gateway to a development of skills and knowledge contingent on joining an existing course community embedded in local schools. This extended beyond the end-point of the course and into the first few years of teaching as stated by one of the ITE team:

> *I see (our) role as a kind of conduit between research and practice, rather than it just being a year's PGCE course. So it's about seeing what other people do in their research… and thinking how do we take that academic research and apply it in schools?… it's almost like a 5-year transition in which you continue to work with people beyond their initial training period.*

The course team indicate the HEI as the site of 'powerful knowledge' (Mincu and Davies 2021) in its role as purveyor of the theory underpinning practice. A proliferation of one-year ITE courses is critiqued here. The course mediates policy through a blurring of boundaries between course completion and ECT years, between ITE and continual professional development. Whereas the schools-based apprenticeship model is conceptualised as fostering the requisite skills for teaching in a twelve-month period complemented by two years of mentoring via the Early Career Framework (ECF), this PGCE sees five years as more realistic. This reconstitutes a colonial set of temporal parameters related to becoming a teacher, accommodating a much longer developmental period with no rigidly defined end-point. This open-endedness is illustrated by the following excerpt from an alumnus, now a Head of Maths:

> *I've brought everything from that ITE course into the department and they still support me, 13 years on, with resources and recruitment.*

We see this as a privileging of local practices of solidarity across the partnership that balances the local needs of students and partner schools. In addition, the course disrupts the temporality

of institutional accountability as costed and measured 'outputs' in ITE. The development of individual students into confident and competent teachers is temporally differentiated: some student teachers take longer and require more support than others to complete the course journey, the ECT year and to be retained in the job.

The mentoring role is a new structural feature of the Early Career Framework (ECF). In this PGCE, however, it has become established as a complementary input of the ITE curriculum: a situated 'node' in the wider partnership network. According to the PGCE team, the mentor role worked effectively because most mentors were *"homegrown"*. While the mentor was expected to *"really take an interest in [the student teachers] and some responsibility"* (ITE staff), s/he sat within the wider structure taking a whole-school approach to support. This allowed for the collegial and public interest values instilled in the students to be passed on to other members of staff within their departments. Where student-teachers were placed in schools with no alumni as mentors, the ITE team saw it as their responsibility to "*develop the teachers and mentors in Maths departments*" foregrounding a disregard for institutional boundaries. Additionally, student placement was rooted in individual need:

> *We take great care in putting [students] in the right school for them… but also with the mentor that we think would work well with them. We very rarely send them by themselves, so they would go in supportive groups of 2, 3 or 4 student teachers and again we choose very carefully those teams of trainees* (Maths PGCE team).

This can be interpreted as a dialogical orientation towards localised public good that is illustrative of decolonised and anti-racist practice. An ethic of care surfaces repeatedly in the data and here exemplifies the relational pedagogy championed by the course team. It contrasts with a neoliberal subject-positioning of individuals as accountable for their own progress and success. We see in this a rejection of the compulsion under market conditions to recruit selectively; it evidences 'a *relation of care…* recognising and accepting vulnerability… the point of departure of every ethical elaboration whose aim, in the last instance, is humanity' (Mbembe 2016, 175).

This broader relation of care contributes to stability and a supra-institutional public good: the recruitment and retention of Maths teachers and, according to the headteacher interviewed, to 'improving' results:

> *We weren't able to have a fully staffed Maths department until we started to work with (University) and it's the only reason we've been able to staff our Maths department with good quality Maths teachers… that's allowed us to have some stability in Maths and our results are improving… without (University) I don't know how we would have continued to recruit into Maths…* (Headteacher)

The course team's belief in and commitment to the student teachers also extends to the communities that they come from. The cohort at the heart of the study comprised more than 90% students from global majority backgrounds. Many of these came from the communities served by the partnership schools:

> *You know I grew up in this area… the other week I was standing outside the pharmacy… and a child looked at me and said, 'Sir how are you?'… she told her mum that I was her Maths teacher and she was happy to see me… I live off that recognition… the children know that you are local and brought up just like them… when I'm teaching children I can meet them at their level.* (Ismail, Maths Mentor).

Critical pedagogy and decolonial educational practice recognise background as a vital starting point in learning and the foundation from which further learning can take place rather than as a source of deficit assumptions. The student actors connected biography to their purposes in undertaking the course:

> *I wanted to become a Maths teacher a long time ago... I come from a family of eight, from a poor background, and we lived in a 2-bedroom terraced house... So the priority after school was to go out and make some money. For the first 20 years of my life I worked and… (now) I'm in a good position and I thought now I'm going to go and become a teacher.* (Ismail, Maths Mentor).

Recruiting student teachers who come from backgrounds shared by the children in their classes not only offers the advantage of creating role models (Gershenson et al 2022) but as a member of the local community, Ismail can tap into the socio-cultural understandings that enable authentic reciprocal encounters and contribute to a self-sustaining architecture of community development. This acts as an unrecognised form of appraisal – underpinned by affective connections and shared lived experiences – providing an affirming alternative to the performance-based appraisals that, according to Glassow (2024) exacerbate attrition.

Theme 1b: Disrupting NQT Policy
Longstanding partnership relations provided a foundation for a disruption of Newly Qualified Teacher (NQT) policy through intensive and sustained on-course support complemented by a temporally differentiated post-course input. The course team talked of "living in their schools", emphasising a long-term commitment to supporting student teachers, NQTs and other Maths teachers in an all-inclusive "symbiotic" network of Maths practitioners. The course team highlighted the impact of budget cuts:

> *because of the pressure from the Government on school budgets we're asking mentors to continue to educate our students with no money and no time - it's absurd…. this Government is starving schools and has been for the last 10 years.* (Maths PGCE team)

As an element of neoliberal market policies, responsibilisation (Peeters 2019) is the transfer of responsibilities from the state to social actors. This has shifted the responsibility for ITE onto competing institutions within the market positioning them as self-interested rather than inter-related within a broader field of the public good. When budget cuts were seen to affect schools' ability to invest in training, the partnership relation was threatened by a view, supported by the market *commandement,* that the awarding institution (in this case the HEI) is tasked with producing fully-fledged 'professionals':

> *they treat NQTs like the finished product… they don't buy into their role in training them.* (Maths PGCE team)

The distinct pathways of school-based as opposed to HE-based provision create the conditions in which either schools take the responsibility of training their staff or they expect this to be undertaken by the HEI. There is a structural flaw here: a market-driven policy of standardisation that stipulates a one-size-fits-all duration for ITE that is deaf to a grass-roots understanding that a one-year course only provides the beginning of the student teacher's journey. In the partnership however, quality inhered in nurturing student Maths teachers through their NQT years. These longitudinal relations rehumanise current NQT policy and this is illustrated by Fahad, an alumnus and the Head of Maths at a partner school. He spoke of being labelled as a 'failing NQT' in his school placement which almost led him to give up

teaching entirely. However, post-course support from the ITE team enabled him to stay in post and ultimately to become a HoD. This experience impacted on his support for his own staff:

> *In 2008, I was told by the school that… I would fail my NQT year… I went to 3 interviews and I didn't get a job… and then got the fourth job… the ITE team showed me what my strengths were and got the best out of me… so I tell my staff: get to know your students and then work according to their needs… and I encourage teachers to go and have conversations with students, that's the way trust is built.* (Fahad - Head of Maths – Partner school)

We see in the passage above, the feeding forward of the relation of care fostered by the course. This relation of care, integral to critical pedagogy, can be viewed as an expression of decolonised practice. The ITE staff saw their role with NQTs as providing the support that financially squeezed schools were ill-equipped to provide:

> *It's not that schools don't want to support their NQTs and grow their own, they haven't got the time… The expectation [is] that [students] will arrive and "hit the ground running". There's not the finances to enable the support…. also, there's probably not the expertise in schools either in supporting people.* (Maths PGCE team)

It's important to note here that although the Early Career Framework stipulates two years of structured mentor support for ECTs (DfE 2019c), the time for mentoring support is unfunded. As such, the headteacher we interviewed saw support during the transition from student year to ECT as crucial. She commented on the symbiotic qualities of the partnership:

> *I think that word partnership is absolutely what it has been… we've been fortunate enough to work with (Coppleton City University) but I feel that we've also contributed and helped (the university) where we can…*

The schools' contribution here was in taking on student teachers, while the extended support of the HE team made this a valued recruitment process for the school. The Head teacher also found the values of the course team refreshing in a competitive environment characterised by institutional self-interest. What this illuminates is that through ongoing professional relationships with Maths departments, Maths mentors and senior school leaders in partner schools, the PGCE team had established a course reputation for providing successful Maths teachers.

Theme 2a: Learning to teach as part of a collective
The collective identity of the cohort emerged as having a powerful impact on student teachers' experience. The consciousness of having a shared background was a motivating force for many of the students alongside the belief of the staff:

> *The commitment that we bring to the course is brilliant... and they've taken on some of us who other unis wouldn't have taken a chance on…. they saw something in us and as such they get the best out of us because they were prepared to take that chance with us.* (Anya, student teacher)

The use of a decolonial lens here involves rethinking student-teachers' 'subject position'. Rather than conceptualising them as individuals competing within a neoliberal Academy at the gateway of a standardised schools sector, they can be viewed as practitioners who are both products of a postcolonial system that attempts to reproduce a distinct set of power relations and potential agents of the decolonisation of that system. This foregrounds the importance of

being part of a collective and moving into an existing community. Anya's sense of the collective consciousness of the cohort was exemplified by talk of them being a 'family', a theme that emerged across all three participant focus groups, evidencing a sense of interconnectedness throughout the early stages of their career and beyond:

> *...in most of the schools, the Maths departments are mostly from this uni so they know how it works and how important it is to help new students…. it's like a family.* (Abdi, student teacher)

> *straightaway as I started the course, it had this family-like feeling and that's what hooked me onto it…* (Ismail, Maths mentor)

> *So, we are seeing our students and ex-students… and we're in schools all the time… so it's like going home to our families.* (ITE Team)

The passages above illustrate how a shared collective identity supports students to navigate HE and school spaces in ways that mean they too can then become 'spatial facilitators' (Kaur, 2023) for young people of different backgrounds. This collective ethos is miles away from the self-interested careerism that ostensibly underpins pathways such as *Teach First* (Elliott 2018).

Theme 2b: Pedagogies of hope
Focused on hope, the final subtheme maps across both critical pedagogy and decolonial theory as both are orientated towards realising 'hopeful presents and futures' (Bagga-Gupta 2024, p.419). Critical pedagogical approaches eschew labelling students and aim to (re)build their self-confidence and self-belief with a view to bringing about material change in their lives in the social world. One PGCE staff member emphasised his belief that: "all kids can learn and all kids want to learn". This egalitarian assumption rejects the meritocratic *commandmente* of school-based cultures of assessment orientated around 'ability' and the self-interest of competitive marketized relations. This was a belief resurfaced in the interviews with the school mentors:

> *The majority of teaching is controlled by how you act with the children and how they react to you… if you spend time building relationships with the children… it doesn't matter how difficult the child is, if you get to know the child you can then teach them… it's about being approachable… I never shut my door, I encourage students to come and ask me questions.* (Ismail, Maths teacher / mentor)

Ismail's approach here evidences a commitment to "exploring how and why particular social and cultural groups of persons occupy unequal political positions of access to social structures", with an implicit acknowledgement that traditional deficit-centred definitions are "ideologically aligned" (Bishop, 2014, 53).

The PGCE team echoed this Freirean, values-based approach seeing themselves as "architects of hope"*,* their practice reaching beyond individual students and rejecting the othering of communities on the basis of race and/or class. As such, they positioned partner schools as assets within local communities that the course sought to strengthen and saw themselves as supporting their students to "become 'change agents'" – in other words, to interrupt the negative cycles originating in social conditions that can limit educational achievement. In the words of one interviewee:

A lot of the trainees on the course, myself included, are not academically bright but what we have… is an understanding of where some of these students are coming from and how to relate to them - because they don't care about how much you know until they know how much you care…. (Head of Maths, secondary school).

Seen like this, through a relation of care, this example of Maths ITE is a vehicle for bringing about social change.

Concluding Thoughts

Our paper presents empirical evidence showing how, despite a government preference for school-based networks regulated through markets and steered through centralised policy, local HE-based praxis can offer socially and educationally transformative provision. Concurring with Pipere and Micule (2014) our analysis foregrounds the importance of affect: the experience of solidarity within a collective underpinned the sustenance and growth of the student teachers' relationships with Maths. As such, our findings challenge the primacy of selective recruitment as cohering with the interests of students and communities from global majority backgrounds. They illuminate how a community of Maths teachers and students that extends across institutional boundaries against the grain of schools' competitive relations can address issues of representation and retention. In our data what is original is the contention that the affective environment provides a foundation for Maths teaching that outweighs the importance of subject knowledge on entry.

The implication from literature that existing policy structures have racialised outcomes is clear. Our analysis adds that remedying this involves practice that operates against market logics and that HE ITE, being external to schools as competing institutions, and organised according to the values detailed above, is better placed to meet student needs while also addressing recruitment and retention issues. Building on Tereschenko et al (2020) who see retention and promotion fostered by supportive relations and autonomy, our analysis suggests that a marketised structure that atomises the 'delivery' of Maths into competing pockets of provision works against this. The course's radical reconfiguring of the temporality of becoming for maths teachers is a key finding and another factor in its success bucking national trends in recruitment and retention. It disrupts the orthodoxy of the standard one-year course by extending longitudinal support beyond HE classrooms and across partner schools.

Our data also suggests that Glassow (2024) and Gossoway's (2024) perspectives on how appraisals and performance-based accountability contribute to poor retention of teachers in 'hard-to-staff' settings" is an example of a racialised structural failing in school-based ITE policy. Our analysis sees supportive HE ITE, networked across the market terrain, as being better able to coordinate individualised support.

Finally, our analysis positions ethnicity centrally in ITE. Decolonial perspectives add to Brown et al's (2004) reservations about centrally prescribed universal approaches like 'mastery', seeing them as inherently normative and thereby racially discriminatory. Locally orientated provision has to offer broader, differentiated approaches. Our analysis suggests that Benson's (2019) point that enhancing diversity policies and training in schools can address retention issues underestimates the pressure of market performance that only ever positions ethnicity as an extraneous consideration rather than as central to teachers' experience and identity. The ITE course we researched with its longitudinal and supra-institutional support structures employed practices that dealt effectively with both issues.

This article provides an example of a course offering a positive alternative in the current centralised and market-driven landscape of Secondary Maths ITE in England. Subverting discriminatory market logic in order to address global majority under-representation through its anti-racist recruitment and pedagogical approaches, the course's axiological focus presents a powerful challenge to current neoliberal market orthodoxy. It also suggests teacher educators have a responsibility to engage with and commit to the powerful lived experiences of global majority students in order to catalyse change.

Acknowledgements

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