Exploring the life histories of black women's early career academics in the Science, Technology, Engineering and Mathematics (STEM) fields within UK higher education institutions.

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<u>Declaration</u>

I, Peace Akuwudike, confirm that the work presented in this thesis is my own. Where information was derived from other sources, I guarantee this has been indicated in the thesis.

Signed:————————————————————

Abstract

This life history-based thesis examines the experiences of six black women early career academics in the STEM field within UK higher education institutions. This thesis explored how the informant's life stories have been shaped by the intersections of race, gender and neo-liberal discourses. It further locates the informant's life stories within broader social, political and historical context in which these experiences occurred.

The life stories of these black women early career academics uncover persisting inequalities based on race and gender differences and the ways in which these informants navigate these unique challenges within UK higher education institutions. It uncovers how these informants' identities and subjectivities continue to be shaped by their participation in the STEM field within UK higher education institutions. As this thesis examines the informant's life stories through the theoretical lens of CRT, decolonial thought, coloniality of gender, racial neoliberalism and Bourdieu capital theories. The findings suggest that the informant's life histories demonstrate how the UK higher education institutions are implicated by race, gender and neo-liberal discourses and how this shapes the STEM field. Thus, it important for relevant stakeholders to consider the racialised and gendered structures and systems within UK higher education in light on the changing demographic of STEM students and academic staff.

This study is important because it highlight the intersectional inequalities based on race and gender which has not be addressed in previous policy discourses and equality charters. By addressing this issue, there would be increased diversity in

STEM field that results in increased research output, products and services useful in

society.

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List of abbreviations

Abbreviations	Meaning
STEM	Science, Technology, Engineering and Mathematics
CRT	Critical race theory
USA	United States of America
BFT	Black Feminist Thought
JACS	Joint Academic Coding Systems
CRAC	Careers Research and Advisory Centre
BME	Black and Minority Ethnic

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Glossary

BME: This term refers to Black and Minority Ethnic groups. In other words, non-white people.

Capitalism: This is an economic system, based on the private ownership of the means of production and their operation for profit. As one of the central characteristics of capitalism is wage labour, this provides bibliographical knowledge and aids in the exploration of black women's nuanced experiences in the global workplace and how this gives rise to key issues including gender pay gap.

Colonialism: This refers to how the experiences of non-white people were shaped by western domination and control and the negative effects of this historical event (See chapter three).

Coloniality of gender: This term highlights the ways in which global gender norms and roles were shaped by western colonialism and patriarchy. This has further disrupted the gender roles in non-western society and enforced male dominance within these non-western cultures.

Conceptualisation of Success: This refers to how black women in the STEM field define and perceive success and advancement in their careers despite the impact of structural inequalities, systemic racism, and institutional barriers.

Counter-narratives: This refers to the stories and narrative accounts of people of colour used to challenge the hegemonic narratives, stereotypes and prejudice held by the dominant race within broader society.

Critical incident: A significant event and experience in an individual's life that has profound impact on their education and career trajectory particularly in relation to identity formation and career aspirations. For this thesis, critical incidents refer to the instances in which informants received information from family and community concerning the importance of education for one's social mobility and how this awareness shaped their aspirations and motivations to pursue STEM career.

Critical Race Theory: This theory provides an analytical framework that explores how the experiences of people of colour are shaped by race and racism within institutions and social structures in multi-cultural society.

Decolonial thought: This term refers to the long-standing effects of colonialism on people of colour. It challenges Eurocentric, standards, values and epistemic knowledge.

Diversity: This refers to a range of people in the workplace and the celebration of their differences based on race, gender, class, age, nationality, sexuality, and disability.

Equality: This refers to the fair treatment and equal opportunities given to people regardless of their social identity including race, gender, and class.

Equality, diversity and inclusion policies: This includes policies and organisations that protect the rights of ethnic minority individuals promoting policies that empower, support and prioritise the needs of black women early career academics in the STEM field within the UK higher education institutions (See chapter two and seven).

Gender Bias: This is a broad discourse that explores prejudiced actions or thoughts based on the gender-based perception that women are not equal to men in rights and

dignity. This provides a bedrock to explore black women's nuanced experiences, particularly with a cultural capital theoretical background. It also gives room to address key linchpin concepts in relation to the study (See Chapter two).

Gender Inequality: This refers to discrimination based on gender while emphasising male dominance in society (See Chapter two).

Gender Pay Gap: There is burgeoning scholarship concerning the 'gender pay gap' within the extant literature. The gender pay gap refers to the differences in pay between men and women. Prior literature has highlighted that women are paid less than men despite possessing similar qualification, experience, and skills. In some cases, women are doing more work than their male colleagues. (See chapters: six, seven and eight).

Imposter Syndrome: A psychological phenomenon where individuals doubt their own abilities and accomplishments, despite evidence of their competence, which is commonly, experienced by Black women scholars within the UK higher education institutions.

Inclusion: This refers to a work setting in which diverse groups of people are fairly treated and valued by their employer.

Interpretivism: This is a philosophical concept that suggests that reality is subjective, multiple and socially constructed. This suggests that reality is relative and based certain individualised social and historical context. This is a qualitative study that draws on the interpretivist philosophy that has shaped the choice of research method and data analysis technique (See chapter one and four).

Intersectionality: An analytical framework that highlights the overlapping nature of social identities including race, gender, and class. This theory highlights the ways in which black women face multiple oppressions based on their race, gender, and class membership (See chapter seven).

Life History approach This refers to a qualitative method in which the researcher examines the life stories of individuals within the broader social, economic, political, and historical context in which these experiences occurred. This methodology was deployed to explore the lived experiences of black women early career academics in the STEM field within the UK higher education institutions to ascertain their success stories as well as challenges in navigating institutional racism and unconscious bias within the academy.

Marginalisation: This refers to the negative treatment an individual or group receive based on certain protected characteristics including, race, gender, class, sexuality, religion, nationality, and disability. Marginalisation is the negative treatment black women receive that further excludes them from information, opportunities and networks that are useful for their advancement within the academy.

Micro-aggressions: This refers to the subtle, often unintentional, discriminatory actions and comments that perpetuate stereotypes and bias against Black women.

Narratives: This refers to the stories and narrative accounts of the informants. For this thesis, this includes the stories of six black women early career academics in the STEM field within the UK higher education institutions. These stories provide insight into the lived experiences of the informants in this study.

Neo-liberalism: This term refers to policies that promote the transfer of power from the government to the private sector. It also refers to the laws guiding free-market capitalism (See chapters one, two, and five).

Occupational Segregation: Occupational segregation is the distribution of workers across and within occupations, based upon demographic characteristics such as gender, race/ethnicity, culture, nationality, sexual orientation etc. These demographic characteristics often intersect in the concept of this study. This provided background knowledge on careers that black girls and women are typically encouraged to embrace/pursue; and how that can affect their experiences in fields where they are under-represented. (See chapter two).

Racial neoliberalism: This term refers to the uneven distribution of wealth, resources and opportunities based on racial hierarchies. This underpins the long-standing effects of colonialism present across cultures that were previously colonised by the British empire.

Racial Inequality: This study draws on the discourse on racism to explore inequality particularly in the education system and the corporate world. It addresses key socio-economic and cultural factors, such as racial disparities in access to education (particularly, higher education), employment, discrimination in higher education and high income earning; all of which overwhelmingly affects minority groups. However, this enables the narrowing in, on black women's experiences in STEM Fields. Racial Inequality can be seen in social actions, practices, or political systems that support the expression of prejudice or aversion in discriminatory practices (See chapter two).

Representation: This concept refers to the fair and accurate portrayal of individuals from diverse backgrounds particularly based on race and gender identity within the academic and professional contexts. For this thesis, it refers to issues of invisibility and hyper visibility of black women in STEM fields (see Chapter six and seven).

Self-Reflexivity: This addresses the examinations of one's beliefs and how that affects life choices.

Social mobility: The movement of individual, families, and groups from one social class membership to another. For this thesis, the informants reported desiring success in their respective STEM discipline for their upward social mobility.

Stakeholders: Individuals, organisations, or institutions that have a vested interest in the issues addressed in the thesis, including policymakers, academic staff and higher education institutions.

STEM (Science, Technology, Engineering, and Mathematics): An acronym representing the academic disciplines of science, technology, engineering, and mathematics. For this thesis, this acronym is focused on the experiences of black women early career academics in STEM fields within UK higher education institutions.

Support Networks: This refers to formal and informal systems of support, including mentoring programmes and peer networks, developed to help Black women in STEM field overcome challenges and succeed in their academic and professional pursuits.

Systemic racism: This refers to the unequal treatment of an individual or a group based on their membership of a particular ethnic group arising from systems, structures and institutions that are well established in society.

Unconscious Bias: This concept is often explored in the discourse of social psychology, which studies the mind and behaviour, whilst interacting with other people. It explores individual personality and how that impacts on interpersonal relationships, and group behaviour. Gestalt psychology is a branch of social psychology that provides a foundation for understanding perception. The theory emphasises that the whole of anything is greater than its parts; that is, the attributes of the whole are not deducible from analysis of the parts in isolation. In the context of this study, this provides a significant linchpin for understanding how black women's micro/individual experiences can be determined by macro stereotypes, often attributed to the race and gender. This is largely explored and understood specifically in the context of other individuals, who are not of the race and gender and sometimes other black women, not being able to reconcile blackness and femaleness with certain achievements, accolades and milestones. This contributes to the negative experiences that black women may face in the corporate world and higher education.

WAEC: This is an acronym for West African Examinations Council. This examination is taken by senior secondary school children to determine their career path in West Africa.

Chapter One

1.0   **Introduction**

This thesis is concerned with issues of representation, narrative, and the experiences of black women in the Science, Technology, Engineering, and Mathematics (STEM) field within UK higher education institutions. By examining the narrative accounts and life stories of the six black women early career academics in the STEM field within UK higher education institutions, this study highlights the ways in which the UK higher education institutions are implicated by race, gender and neoliberal discourses. This uncovers how these black women early career academics identities and subjectivities are shaped by their participation in the STEM field within UK higher education institutions.

Drawing on the theoretical lens of CRT, decolonial thought, coloniality of gender, racial neo-liberalism and Bourdieu capital theory. This study uncovers how the informant's life stories are shaped by race, gender and neoliberal discourses and how these informants navigate unique challenges of structural inequalities and systemic racism within UK higher education institutions. By centring the black women early career academics 'voices' and 'life stories', this study highlights the need for relevant stakeholders to consider reviewing the racialised and gendered structures and systems of oppression that marginalises black women in light of the changing demographic of STEM students. This study is timely because there are increased scholarly interests in the experiences of black women in the STEM field. This intersectional study highlights the race and gender disparity in the STEM field within UK higher education institutions.

This study examines the multiple factors including lack of mentors, less opportunities for networking and feelings of exclusion that shape the race and gender STEM gap in UK higher education institutions and the labour market. Due to the increased interest in widening participation for girls in STEM field. This study is focused on the intersectional issues including race and gender discrimination that shapes young black girl's aspirations to study STEM subjects. In addition, this study considers the enduring challenges faced by black women in pre and post doctorate levels within UK higher education institutions.

Drawing on the use of life history method, this study uses life history approach to explore the subjective realities of broader systematic and institutional barriers that shape black women's experiences in pursuing STEM subjects. This research gives insight on the 'success stories' as well as challenges that black women face in their career trajectories.

Prior scholarship has been largely US-centric in exploring the race and gender disparities as well as the role of systematic racism within USA higher education (McGee and Bentley, 2017; Charleston *et al.*, 2014; Ireland *et al.*, 2018; Alfred *et al.*, 2019; Dickens *et al.*, 2021). This study moves beyond the USA body of work and the burgeoning scholarly interest in the experiences of black women scholars within UK higher education institutions. This study contributes to the building a body of knowledge

Bhopal (2020; p.700) argues that BME academics are positioned as 'outsiders' in the UK academy and black groups suffer the most disadvantage in the academy within the BME groups. Black groups are least likely to achieve a first class or 2:1-degree

classification at undergraduate level and they are least likely to pursue postgraduate research degrees (Reay, 2018). Black women are most likely to suffer both an ethnic and gender pay gap in comparison to their white colleagues. Statistics shows that black women are paid 26% less than their white colleagues with similar education, experience, and qualifications (Daufin, 2017, p.57). Despite the advances in policy making including the Race Relations Amendment Act 2000 and the Equality Act 2010, black women and other ethnic minority individuals continue to experience overt and covert forms of racism that impede their advancement in the UK academy (Bhopal and Pitkin, 2020; p.530). This study explored the experiences of black women in the STEM field within the UK context.

This chapter covers the research rationale, research questions, study objectives, motivations for the study, research significance, contributions to knowledge and the limitations in this study. This study examines the ways in which race, gender and location could potentially shape the experiences of black women early career academics. This is a relatively new area that has been under-explored in prior literature. Following the work of (Arday and Mirza, 2018; Bhopal and Pitkin, 2020; Joseph-Salisbury, 2019), this study uses a conceptual tool including life history and critical race theory to give voice to marginalised groups in society. Findings in this study contribute to the body of anti-racism scholarly work in UK higher education institutions.

1.1 Background

This life history-based study aims to examine the experiences of black women early career academics in the STEM field, highlighting how the intersections of race, gender

and location shapes the career trajectories of black women early career academics in the STEM field within UK higher education institutions. The term 'STEM' field encompasses all disciplines essential for a highly technological economy, have garnered significant attention globally, with universities and governments, including the UK, striving to attract learners to these fields (House of Lords, 2012; Brown *et al.*, 2011). Despite variations in the definition of STEM across countries, it typically includes disciplines such as engineering, biochemistry, mathematics, and computer science, aimed at fostering skills vital for problem-solving, communication, and innovation (Brown *et al.*, 2011).

Diversity within STEM is widely recognised as essential for fostering new insights, creativity, and better science (Nielsen *et al.*, 2017). The collaboration of diverse minds and experiences is viewed as pivotal for scientific progress (Haraway, 1988; Gibbs *et al.*, 2014). Additionally, organisations with greater diversity have been shown to achieve higher levels of profitability (Ferdman and Deane, 2014; Bohnet, 2016), underlining the importance of inclusivity within the STEM fields.

However, despite the recognised contributions of STEM field to wider society, black women remain largely under-represented in the UK STEM field, comprising less than 2% of the workforce (Royal Society, 2020). Furthermore, they are disproportionately disadvantaged in terms of academic achievements, career progression, and pay compared to their white counterparts (McGee and Bentley, 2017; Pew Research Center, 2021). This can be attributed to structural inequalities and institutional barriers that hinder the educational trajectories of Black and other ethnic minority individuals,

further perpetuating disparities in ethnic representation and diversity within the STEM field (McGee and Bentley, 2017).

Prior literature has attributed the underrepresentation of black women in the STEM field to the racial stereotyping and lower teacher expectations that shape young black girls' aspirations in the STEM field (Archer et al, 2015). This issue causes young black girls to select social science courses rather than STEM subjects throughout the academic pipeline (Archer et al, 2015; Willingham and Cole, 2013). Archer et al (2016) argue that these challenges persist despite the efforts made by the government to widen participation for girls in the STEM field particularly in post-secondary education. Moreover, the dominance of white, middle-class, and male identities within physical sciences further exacerbates the lack of diversity in STEM fields (Dancy *et al.*, 2020).

Black scholars are positioned as outsiders within spaces including UK higher education institutions, traditionally reserved for elite white men due to institutional racism that persists within these institutions (Bhopal and Pitkin, 2020; Rollock, 2019). The term 'institutional racism' can be defined as the collective failure of an organisation to provide an appropriate and professional service to individuals due to their colour, culture and ethnic origin. This can be detected in the processes, attitudes and behaviours that lead to prejudice, racist stereotyping, ignorance, and thoughtlessness that disadvantage ethnic minority groups (Macpherson, 1999).

Black academics continue to face covert and overt forms of racism despite the advances in policy making and equality initiatives (Bhopal and Pitkin,2020). Furthermore, the career progression of black academics is hindered due to these persisting issues (Bhopal and Pitkin, 2018). A University College Union (2019) report

shows that BME academic staff earn less than their white colleagues and are least likely to be promoted to senior positions. Within this group, BME academics face a 9% ethnic pay gap compared to their white colleagues while black academics are paid 14% less than their white colleagues. This shows that ethnic pay gaps and promotion disparities demonstrate the extent to which institutional racism and structural inequalities shapes the career trajectories of black academics within UK higher education institutions (University College Union, 2019).

This study draws on a theoretical blend including critical race theory, racial neo-liberalism, decolonial thought, coloniality of gender and Bourdieu theory of capitals as a theoretical lens to explore black women early career academics' experiences within UK higher education institutions.

The counternarrative aspect of CRT was useful in highlighting the 'voices' of marginalised groups affected by systemic racism and structural inequalities (Gillborn, 2006). This CRT perspective provided an analytical framework to examine the informants narrative accounts through the theoretical lens of decolonial thought, coloniality of gender and racial neo-liberalism. By highlighting how racial inequalities are perpetuated through systems of power and privilege, CRT underscores the need to address systemic racism in the STEM field within UK higher education institutions. In addition, Bourdieu's theory of capitals gives insight into the role of class in shaping education and career trajectories, emphasizing the interplay between social, cultural, and economic resources in perpetuating inequalities (Courtois and O'Keefe, 2019).

Racial neoliberalism is relevant to this study because it uncovers the complex relationship between race and capitalism in contemporary western society (Kundnani,

2021). This theoretical framework uncovers the racialised hierarchy in the distribution of resources and opportunities within UK higher education institutions. It helps demystify the concept of meritocracy within the UK higher education institutions and provides evidence for the link between racial inequality and globalisation (Kundnani, 2021).

The neoliberal reforms in higher education, characterised by marketisation and privatisation, have further exacerbated inequalities, particularly for early career academics, including black women (Ball, 2012; Courtois and O'Keefe, 2019). The precarious nature of academic employment, intensified by the COVID-19 pandemic, has disproportionately affected black women, who are over-represented in low-paid and temporary roles (Siddique, 2020). Consequently, the pandemic has exacerbated existing challenges faced by black women in the STEM field, further limiting their opportunities for career advancement and mentorship.

By employing a life history influenced approach, this study seeks to highlight the complex interplay between wider social structures and individual experiences, shedding light on the systemic barriers faced by black women early career academics in the STEM field within UK higher education institutions. Through an intersectional lens, this research aims to contribute to the growing body of anti-racism scholarly work, advocating for policies and interventions that promote inclusivity and equity within STEM and higher education.

1.2 Research problem

This study aims to examine the life histories of black women early career academics to identify the ways in which race, gender and location shape their experiences of

black female academics in the STEM field within UK higher education institutions. Arguably, black women suffer the most disadvantages in the academy as they are members of multiple oppressed groups (Crenshaw, 1991; p.1242). Black women identities overlap as they are women, from minority ethnic groups and mostly working-class background (Crenshaw, 1991). Indeed, Boliver (2016; p.248) argues that racism and sexism persist in the academy despite the general perception of this sector to be a liberal and progressive field. For example, Rollock (2019) argues that black women face racist bullying and harassment that hinders their advancement in the academy. Furthermore, there are fewer numbers of black women in the STEM field to disrupt the barriers they face within the academy. Also, there remains limited literature on the experiences of black women early career academics in the UK higher education institutions let alone the STEM field. Much of the literature is focused on the attainment gap between BME students and white students (Claridge *et al.*, 2018; Panesar, 2017; Bunce *et al.*, 2021) and more recently some work has explored the experiences of BME senior academics (Bhopal,2015) and black female professors (Rollock, 2019). There is scant literature on the lived experiences of black women in the STEM field within the UK higher education institutions. Prior scholarship has been largely USA-centric with much focus on the race and gender disparity in the USA higher education institutions. However, this study addresses a gap in the literature by employing relevant theories including CRT, decolonial thought, coloniality of gender, racial neo-liberalism and Bourdieu capital theory to uncover the ways in which the informant's identities, experiences and subjectivities are shaped by race, gender and neoliberal

discourses. In addition, it reveals how these informants navigate unique challenges within UK higher education institutions.

On a policy level, the Equality Act 2010 places a general responsibility on universities to consider eliminating harassment, victimisation and discrimination from these institutions in order to foster good relations and advance equal opportunity (Jolly *et al.*, 2022). The UK higher education institutions must consider these aims while making decisions as education providers and employers as well as reviewing policies, designing services, and commissioning those services to others (Jolly *et al.*, 2022). Despite the advances in policy making including the Race Relations Amendment Act 2000 and the Equality Act 2010, these policies have been submersed in tales of rhetoric rather than specific policy driven action (Bhopal and Pitkin, 2020). Despite the presence of these policies, universities have not tried at making penetrative changes that will reduce structural inequalities and institutional barriers within the UK higher education institutions. Thus, universities are freed from following the statutory obligations regarding race equality. The effects are seen in the ways BME academics continue to experience overt and covert forms of racism despite the existence of these policies (Bhopal, 2020). For example, BME academic staff receive lower pay on average and are less likely to benefit from permanent/open-ended contracts of employment (Bhopal and Pitkin, 2020). BME staffs are most likely to move to overseas higher education in search of better opportunities due to the disadvantages they face in the UK higher education sector (Bhopal, 2020).

BME students are least likely to graduate with a first class or 2:1 degree from university and they are less likely to be employed six months after graduation in comparison to

their white peers (Bhopal and Pitkin, 2020; p.531). Statistics shows that 67.7% of BME students achieved a first class or 2:1 in comparison to 80.9% of white students (Advance HE, 2019). There is a 13.2% attainment gap between white and BME students (Advance HE, 2019). These statistics are stark, and this shows the wider structural inequalities and institutional barriers BME students face at undergraduate and post graduate levels of education which prevents them from excelling in their education trajectories in comparison to their white counterparts. Consequently, there are fewer numbers of BME staff in senior positions to argue for the experiences they face in the academic pipeline. Also, Black women are concentrated in certain female dominated disciplines in post-1992 institutions.

This study uses conceptual tools, including the life history method and Critical Race Theory, to provide new insights into the experiences, identities, subjectivities, and narratives of black women's early career academics in relation to the challenges they face in STEM fields within the UK higher education institutions. These conceptual tools of Critical Race Theory (CRT) and life history method helps democratise the academy and highlight the voices of marginalised groups namely black women within the academy as seen in the empirical chapters five, six and seven.

1.3 Research aim

This study examined the life histories, experiences, identities, and subjectivities of six black women early career academics in STEM fields within UK higher education institutions.

1.4 Research objectives

The objectives of this study are:

- To examine the experiences of black women early career academics in STEM fields within UK higher education institutions.

- To examine how issues of race, gender and location shape the experiences of black women early career academics STEM fields within UK higher education institutions.

- To examine how these black women early career academics, conceptualise success and advancement in their career.

1.5 Research Question

This section covers how the research question emerged and my personal motivations for carrying out this study. Research questions play a key role in the research process that includes establishing a link between the literature review and the data collected and it helps identify the most suitable research design and methods used to answer the research questions (Bryman, 2016). It is important to explain the evolution of three key research questions guiding this study. Drawing on CRT and life history methods, this thesis is focused on giving voice to marginalised groups namely black women within the academy through counter storytelling to disrupt hegemonic and oppressive mechanisms that perpetuate inequality within UK higher education. This study is timely following the increased interest in anti-racism work in schooling, higher education, and wider social structures. The study focuses on the experiences of black women who are a minority group within the presently neoliberal and colonial UK higher education setting (Solórzano and Yosso; 2001). The epistemological underpinnings for this study are subjective based on the nature of qualitative data collected. These informants'

accounts are subjective and based on multiple realties rather than from the positivist perspective of one singular and objective reality (Bryman, 2016; p.30).

Drawing on the theoretical lenses of CRT, decolonial thought, coloniality of gender, racial neoliberalism and Bourdieu capital theory, this study highlights the informant's life stories and uncovers the ways in which UK higher education institutions are implicated by race, gender and neoliberal discourses. Statistics state that there are less than 2% of black women in the STEM field within the UK higher education institutions. McGee and Bentley (2017) attribute the shortages of black women in the STEM field to lower teacher expectations and racial stereotyping that further hinders young black girls' aspirations in STEM fields. Key focus is also placed on the experiences of early career academics, considering that there are burgeoning scholarly interests on the levels of precarity that early career academics experience following the neo-liberal reforms in the UK higher education sector. This precarity in academia, which involves working fixed-term contracts without the assurance of obtaining open-ended and permanent contracts, disproportionately affects women and ethnic minority academics in UK higher education institutions.

The research questions evolved over some months, informed through engagement with prior scholarship on the experiences of black women in the academy and my personal desire to highlight the struggles that black women undergo in their career trajectory. These questions have influenced decisions about both data collection and analytical methods. The three research questions this study sets out to answer are:

- What are the experiences of black women early career academics in STEM fields within the UK higher education system and institutions?

- How do issues of gender, race and location shape the experiences of black women early career academics?

- How do these black women early career academics conceptualise success and advancement in their careers?

1.6 What is my personal motivation for this study?

This is a qualitative research project informed by an interpretivist and constructionist perspective with the conceptual framework including CRT and life history method used to highlight the voices of marginalised groups namely black women in STEM fields. Thus, I am aware that I am required to immerse myself into this research project. This allows me to narrate how my background, experiences, subjectivities, perspectives and attitudes shape my motivation for this study (Cohen et al., 2013). According to Denzin and Lincoln (2011,p.67) 'the researcher is allowed to declare all biases in this study through autobiographical accounts of themselves to the audience. This enables the audience to understand the context of their arguments and interpretations of informants' stories in a study'. Self-reflexivity plays a key role in qualitative research that helps to clarify one's rationale for the study (Valldejuli et al, 2023; Stiles, 1993).

My biography is thus implicated in the motivations and rationale for this study. I am an emerging black female scholar who recently relocated to the UK from Nigeria in 2020 for my doctoral studies. I have always been interested in subjects related to race, inequality, and ethnic studies. These subjects draw on various sociological theories that often fulfil my intellectual curiosity which involves going beyond what is established as existing knowledge. I had previously completed my bachelor's and master's degree in the UK before returning home for work. However, I attended

primary and secondary school education in Nigeria. During my secondary school education, I was taught by well-informed and enthusiastic teachers who had a keen interest in the subjects taught, despite their low-income. This passion was transmitted to the students which led to successful West African Examination Council (WAEC) results. I am one of those students who benefitted from my teachers' diligence and passion, which enabled me to gain good WAEC results. Due to the inadequate services provided by the higher education sector in Nigeria, I chose to study in the UK, which can partly be attributed to my upper-middle-class privilege that was not available to some of my friends who had to study in Nigerian universities.

On my arrival to the UK, I noticed the prior studies shows that there is a 13.2% attainment gap between white and BME students and this is often informed from a deficit perspective on the part of BME students. There is little or no mention of how structural inequalities or low teacher expectations can impact the performance of BME students in the UK. For this reason, there are fewer numbers of BME academic staff occupying senior or leadership positions in the UK (Arday, 2018). For example, there are only 3 BME vice-chancellors and 20 UK born BME deputy vice chancellors compared to the 530 white ones in the UK (Arday, 2018). This shows that there is less support and mentoring that will encourage BME academics to progress through the academic pipeline compared to their white colleagues.

Teachers were more supportive of their students in Nigeria, and they were eager to transmit this enthusiasm to their students despite their poor working conditions. My secondary school teachers used some engaging strategies with their students like

asking questions that needed feedback and they were eager to teach students study skills that were essential for learning at all levels of a student's education trajectory.

While studying in the UK, I have never been taught by a black female professor. Even subjects regarding race and ethnicity are often taught by white professors from an exclusionary standpoint, mainly deflecting the impact of institutionalised racism on ethnic minority individuals, and this is often informed from a deficit perspective. Joseph-Salisbury (2020) argues that teachers and lecturers in the UK need to be culturally aware to provide an inclusive learning space for the diverse students in the classroom. This will further improve the performance of BME students and promote anti-racism in schools and universities.

As a CRT scholar, I draw on the body of anti-racism work and other CRT scholars (Bell, 1995; Bhopal and Pitkin, 2020; Crenshaw, 1991; Delgado and Stefancic, 1998; Gilborn, 2008; Joseph-Salisbury, 2019) who argue that racism is normal in society and not merely an aberration and they further challenge the oppressive mechanisms that perpetuate hegemonic narratives of objectivity, neutrality and meritocracy of the dominant western society. I draw on the intersectionality and counter narrative aspects to unpack the multiple oppressions that black women face in the STEM field within UK higher education as well as giving voice to these black women concerning their lived experiences in the academy

This study is important because recent statistics suggests that there are more BME students studying STEM subjects. Statistics shows that, 50.3% of BME students study STEM subjects compared to 47.3% of white students (Advance HE, 2019). However, BME students are better represented among STEM students studying at

undergraduate and taught postgraduate level which is (26%) and (24.4%) respectively but they are underrepresented in research degrees (18.1%) (Advance HE, 2019). I would like to pursue an academic career in the UK higher education institutions. Thus, I chose this topic to gain insight on the challenges black women academics encounter in predominantly white institutions particularly in the lucrative STEM fields. Drawing on Hill-Collins (1986) black feminist thought, I argue black women hold a unique standpoint to write about their lived experiences considering that black women undergo a perpetual invisibility in policy discourse and mainstream feminism movement (Burns and Chantler, 2011).

Bhopal and Pitkin (2020) argue that much of the literature has focused on gender equality in the global north rather than transnational feminism that takes an intersectional approach to examining the growing inequalities in relation to gender, race, class, nationality, religion and sexuality. Consequently, the emphasis made on gender equality rather than intersectionality increases the numbers of middle-class white women in senior positions while overlooking other women and men of colour in the academy (Bhopal and Pitkin, 2020). The concept of 'womanism' or 'black feminism' has risen as a critique of western feminist movement and to highlight the voices of marginalized groups within these categories of 'woman' and 'black'.

Also, scant research has been done on the effectiveness of these race equality policies. Scholars including (Ahmed, 2009; Bhopal, 2020) argue that equality and diversity policies are like a 'tick box' system for universities as they engage in this agenda in a superficial and non-penetrative manner. Within the context of the COVID-19 pandemic and the present neo-liberal higher education landscape, black women

early career academics have been greatly impacted because they work zero hours, part-time and on temporary contracts. Furthermore, these black women early career academics are more likely to be made redundant with universities unwilling to renew their contracts (Kinikoglu and Can, 2020).

1.7 Research significance

This study highlights the experiences of black women early career academics in STEM fields within the UK higher education institutions, as this is an under researched area within the UK context in the existing literature. Findings in this study can be used to develop mentoring programmes to encourage young black girls' aspirations in the STEM field within UK higher education institutions.

This study advocates for widening participation of under-represented groups in STEM fields within UK higher education institutions. Diversity in STEM will inspire innovation, creativity and better science which will lead to the production of goods and services particularly in areas on renewable energy, stem cell research and remedies for life-threatening illnesses and this will be useful to the public (Palid et al, 2023).

From an economic perspective, diversity in STEM fields will enable UK universities to preserve their competitive advantage by hiring skilled professionals regardless of their background to meet the demands of the labour market as well as producing goods and services useful to the public. Thus, there is social justice case to be made to widen participation for underrepresented groups and further increase the scientific knowledge of these under-represented groups.

1.8 Contributions to knowledge

This section covers this study's main contributions to knowledge in this field of race, equality, diversity, inclusion, social justice in higher education. These contributions include:

I. **Race and gender disparity:** Prior literature has scarcely addressed the intersectional issues of race and gender disparity in STEM fields within UK higher education institutions. This phenomenon is widely USA-centric as it has been explored in the USA higher education institutions. There is scarce literature on the experiences in a UK context; rather much emphasis has been made on widening participation for girls and women in STEM, with no mention of the intersectionality within this feminist discourse that highlights the experiences of black women aspiring to pursue a STEM career.

II. **CRT and life history method:** The combination of CRT and life history method which are largely narrative driven highlights the 'voices' of marginalised groups namely black women within the academy. CRT uses counter storytelling and counter narratives to uncover the impact race and racism has on black women's education and career trajectory. On the other hand, life history uses a genealogy of the context approach to provide the link between informants' present experiences traced back to the broader social, cultural, and historical context in which these experiences occurred (Goodson and Sikes, 2001). Furthermore, life history method provides in depth insight on how informants' personal background impacts their professional aspirations as well as the broader implications of this study. By combining this conceptual framework,

counter narratives are used to challenge the oppressive mechanisms that shape black women's education and career trajectory. Overall, these conceptual tools are used to give voice to under-represented groups that are often overlooked in big datasets.

III. **Inform policy making:** The findings contribute to the body of anti-racism work in higher education that emphasises the need to increase representation of BME academics to senior positions within the academy. These findings are useful to stakeholders including students, staff, university management, policy makers, to further inform policies concerning equality, diversity, and inclusion within the academy. This study highlighted the long standing structural inequalities, institutional barriers and systemic racism that shape black women's education and career trajectory. It advocates for more policies to address the issues of intersectionality within mainstream feminist movements and to further create a more equitable and inclusive academic environment where scholars can survive and thrive regardless of their background.

IV. **Mentorship programmes:** Most informants mentioned that there is under-representation of black women in STEM fields as well as the absence of role models and mentors that could support young black girls' aspirations in pursuing a STEM career. This study highlights the need for mentorship programs to be developed by higher education institutions to support under-represented groups including black women in STEM fields, to further ensure that young black girls are given an equal chance at pursuing their desired STEM careers.

1.9 The structure of the thesis

Chapter one has presented an overview of the research topic, research aims and objectives as well as research questions, motivations for this study, research significance and contributions to knowledge. Chapter two presents two broad themes including 'Mobilisation, globalisation and higher education' and 'Blackness, gender and inequality'. Chapter three addresses the theoretical framework including Critical race theory, decolonial thought and Bourdieu's habitus, cultural capital theory. Chapter four describes the methodological approach, methods, data collection processes and introduces the informants. Chapters five, six and seven are the data analysis chapters, each focusing on the different aspect of informants' experiences in STEM fields within UK higher education institutions. Chapter eight covers the discussion and provides a link between the literature review and findings to answer the research questions. Chapter nine considers the implications, significance of the study, and recommendations for future research as well as conclusions.

Chapter Two

Literature Review

2.0 Introduction

This chapter sets the context of this study and situates the study aims within the extant literature by highlighting a gap that includes the scarce research on the intersections of race and gender disparity in STEM fields within UK higher education institutions. This study examines how race, gender and location shape the education and career trajectories of black women early career academics in STEM. Recently, there has been an increased interest in the issues of equality, diversity, and inclusion within the academy (Bhopal, 2020). Furthermore, anti-racist scholars have highlighted the persistence of inequalities based on race and gender that shape the levels of representation and the number of opportunities available to ethnic minority academics (Arday, 2018). For this study, the intersections of race and gender disparity that often shape the career trajectories of black women early career academics are examined. Black women and other ethnic minority individuals continue to face overt and covert forms of racism that hinders their career advancement within UK higher education institutions despite the advances in policy making concerning equality, diversity and inclusion in the workplace (Bhopal, 2020). As noted in chapter one, there has been scant literature on the intersections of race and gender disparity in STEM fields within the UK context. Thus, this study examines how the intersections of race, gender and location shape the lived experiences of black women early career academics in STEM fields, within UK higher education institutions.

In accordance with the research objectives, the literature review provides a detailed analysis on the experiences of black women early career academics. This chapter is divided in two broad themes including Mobilisation, globalisation and higher education and Blackness, gender and inequality.

The first theme discusses the concepts of mobilisation, globalisation and higher education and how these concepts are interconnected. This is evidenced in the ways in which globalisation has shaped the mobilisation of knowledge and students in higher education beyond the academy. Furthermore, the chapter considers how globalisation has shaped the higher education landscape by increasing the mobility of international students to host countries as well as the challenges that emerge from these international students living in a multi-cultural and diverse environment. This life history-based project uses the genealogy of the context to trace back the present issues of globalisation, student mobility and multi-culturalism in the host countries to historical context of capitalism, neo-liberalism, and colonisation in the previous years. The second theme includes Blackness, gender, and inequality; the intersections of race, gender, and social class shape black women's lived experiences within UK higher education. The conceptual framing of blackness, gender, and inequality in higher education is introduced. The existing literature in this area is outlined, including the ways in which blackness, gender and social class intersect to produce multiple oppressions for black women within the UK higher education system and institutions. The shortages of black women in STEM fields within UK higher education institutions is due to lower teacher expectations and negative stereotyping that impacts their

education and career trajectory and further hinders their progression throughout the STEM pipeline (Archer et al, 2015).

2.1 Mobilisation, globalisation, and higher education

The concepts of mobilisation, globalisation, and higher education are important to understanding the experiences of black women early career academics. It provides the context for understanding the nuanced journeys of black women early career academics in STEM field within UK higher education institutions. These concepts provide a framework in which these black women's experiences can be analysed, giving insight into the motivations, aspirations as well as challenges that black women face in pursuing advancement in STEM fields.

Prior scholarship has identified the link between internationalisation of higher education and neoliberalism as these concepts emerge from globalisation (Bamberger et al, 2019). The concept of 'neo-liberalism' emphasises individualism, personal responsibility, the supremacy of the market, competition, rational choice, the global knowledge economy that shape the framing of education for individual economic gain (Zajda, 2020). These were recurring themes in the informant's narrative accounts concerning their motivations and aspirations in pursuing STEM fields. These informants recollected the messages they received during childhood about the importance of education for increasing one's social mobility (see chapter five). This can be traced back to the aftermath of 'colonialism' also known as 'coloniality' meaning the longstanding effects of colonialism on attitudes, perspectives and values in previously colonised societies (Maldonado-Torres, 2007). Thus, the messages

informants received during childhood about the importance of education can be traced back to the colonial legacy of the British empire including global inequality, racism and neoliberalism (Davidson and Shire, 2015). I would argue that, the informants were socialised to become neo-liberal subjects striving to accrue capitals similar to the white British elites to secure their own elite status (Ayling, 2015).

The longstanding effects of coloniality on previously colonised countries could be evidenced in the migration patterns of international students leaving their home country to pursue further education in a foreign country because of the benefits including world recognised degree, cutting-edge research opportunities and diverse cultural experiences (Zajda, 2020). This phenomenon is made possible through globalisation that promotes limitless horizons and borderless opportunities that shapes students' aspirations to seeks knowledge and empowerment beyond their home country (Zajda and Rust, 2020).

These overlapping concepts including mobilisation, globalisation, neoliberalism and internationalisation of higher education comprises of a complex and multifaceted nature which is continuously changing across time and place (Bamberger *et al.*, 2019). These concepts provide an analytical framework in which the unique experiences of black women early career academics in the STEM field within UK higher education institutions can be analysed. The link between these overlapping concepts including mobilisation, globalisation and internationalisation of higher education is that students, knowledge and resources are moving beyond geographical borders for the main purpose of profit making (Zajda, 2020).

This phenomenon is relevant to the study aims, most informants were socialised and became neo-liberal subjects based on their family upbringing and expectations (see Chapter five). These neo-liberal ideals can be traced back to the effects of coloniality of attitudes, values and norms in previously colonised countries. It is important to not the difference between 'colonialism' and 'coloniality'. Colonialism refers to the to political and economic relation in which the sovereignty of a nation depends on another nation. On the other hand, Coloniality refers to the long-standing patterns of power as a result of colonialism that shapes culture, labour, intersubjective relations and knowledge production beyond the strict limits of colonial administration. This relates to the informant's narrative accounts because, most informants re-echoed cultural values shaped by coloniality (see Chapter five, six and seven). By examining the informants narrative accounts through this conceptual lens, it uncovers the interplay between race, structure, agency and global power relations.

2.1.1 Mobilisation

Mobilisation, a concept encompassing the adaptability of people, resources, and ideas for movement, serves as a cornerstone of this discussion (Cox, 2014). Previous studies by Ostergaard-Nielsen (2003), Smith (2020) have defined mobilisation as the orchestrated gathering of resources and individuals to achieve specific goals. In higher education, these ideas have been harnessed to widen educational access, meet the dynamic demands of the labour market, and drive research and innovation targeting socio-economic issues. Consequently, within the higher education context, mobilization pertains to the movement of students, academics, and educational resources across international borders for educational pursuits (Cox, 2014).

Crucially, this notion of mobilisation is intrinsically linked to internationalisation – a term denoting the promotion of cross-cultural understanding and collaboration within the realm of higher education (Stein, 2021). This distinction between internationalisation and globalisation is pivotal. While globalisation embodies the interconnectivity and interdependence of nations and cultures on a global scale, internationalisation specifically emphasises fostering cross-border connections and partnerships in higher education. This study establishes a link between internationalisation and the research aims. It uncovers the movement of students, scholars, and academic resources across international borders. Furthermore, this shapes the experiences of black women early career academics in STEM fields (Bennell, 2020). The concept of 'internationalisation' shapes the informants' education trajectory and uncovers the key role of cross-cultural perspectives and collaborative endeavours in shaping the informants' personal and professional lives (Bennell, 2020).

The contemporary landscape of higher education has witnessed a surge in student mobility across the world, underscoring the growing importance of mobilisation in recent decades (De wit and Altbach, 2021). Factors like the globalisation of economies and the emergence of digital technologies have facilitated widespread accessibility to information and communication. Moreover, universities have adopted internationalisation strategies to bolster their reputations and attract diverse student bodies (Stein, 2021). Within this context, De wit and Altbach (2021) contend that mobilisation in higher education takes various forms including study abroad programs, international student exchanges, joint research initiatives, and collaborative teaching ventures. These endeavours are meticulously designed to foster cross-cultural

understanding, facilitate the exchange of knowledge and expertise, and enhance the overall quality of education (De wit and Altbach, 2021). By mobilising resources and individuals across borders, universities create novel opportunities for learning and collaboration that would otherwise remain untapped.

Mobilisation plays a key role in higher education by attracting international students to these host countries (Dewit and Altbach, 2021). Based on the diversity of these international students, they contribute rich ideas and perspectives to the classroom (Beelen and Jones, 2015). These international students learning alongside the local students play a key role in improving the educational environment and contributing to the social and cultural diversity within the university environment (Choudaha, 2017). However, these international students experience some challenges in the study abroad experience including language barriers, hostility and homesickness. Key focus would be on hostility considering that these international students have a different cultural, religious, and racial identity from the locals in their host countries. The feelings of isolation and hostility from locals can emerge from the differences in language, culture, religion, and race. Thus, it is required for host countries and universities to offer robust support and resources that would enable these international students navigate these challenges. These universities are responsible for not only creating an adaptable academic environment and enable international students to have a sense of belonging to their host communities (Ahn and Davies, 2023).

Technology plays a key role in shaping mobilisation in higher education as reinforced by previous scholars in this area (Beelen and Jones, 2015; Altbach and De Wit, 2016; Choudaha, 2017; Courtois and Veiga, 2020). In this digital era, unprecedented

connectivity and collaboration opportunities have emerged for students and academic staff beyond international borders due to technological advancements (Altbach and De Wit, 2016; Choudaha, 2017). These technological tools, such as online learning platforms, video conferencing software, and social media networks, serve as powerful conduits for facilitating virtual collaboration and knowledge exchange. Such mediums transcend geographic constraints, enabling individuals from diverse locations to work together, share ideas, and contribute to academic discourse (Haleem *et al.*, 2022). Moreover, this technological integration aligns with the broader objectives of my study, resonating with the exploration of how black women early career academics in STEM navigate their academic and professional journeys within UK higher education institutions. By assessing how these digital platforms are utilised by this demographic, the research delves into the way's technology influences their experiences, challenges, and achievements (Wong *et al.*, 2023).

Furthermore, the infusion of digital technologies into higher education goes beyond collaboration, as it has the potential to enhance the overall quality of education. With online resources, students gain access to an extensive array of materials and learning opportunities that transcend traditional classroom boundaries (Haleem *et al.*, 2022).

This aligns with the study aims, which examines how issues of race, gender and location shape the experiences of black women early career academics in STEM fields. Technological accessibility and educational enhancement became the most important factors that enable these informants to navigate structural inequalities and institutional barriers in STEM fields. In summary, the concept of mobilisation plays a

key role in higher education, encompassing the dynamic mobility of students, resources, and ideas across international borders in pursuit of academic excellence.

Recently, the impact of technological advancement has been seen with the growing trends of students choosing cross-border studies and universities actively cultivating diverse academic communities. Furthermore, mobilisation of resources and fostering cross-border interactions enables universities to develop opportunities for learning and collaborative engagement, fostering an enriched educational environment. However, it is important for universities to offer robust support mechanisms for international students because these individuals may struggle to adapt to their new environment and achieve academic success. The intersections of these broad concepts underline the interplay between academic mobility, institutional policies and the broader educational landscape aligning this study's objectives that examine the experiences of black women early career academics in STEM fields.

2.1.2 Globalisation

Globalisation involves the processes of trade and cultural interchange between individuals, businesses, and governments, fostering increased interconnections between these entities. This phenomenon also signifies the amalgamation of cultural, political, and economic dimensions on a global level (Goodwin, 2021). Callaghan (2021) argues that globalisation plays a key role in promoting international business activities by facilitating increased information and communication as well as mobility of individuals and ideas across international borders. The term 'globalisation' emerged in the late 1970s to describe the expanding influence of technology, particularly benefiting industries including high-tech enterprises that leverage its potential within a

global context (Goodwin, 2021). Based on this context, an in-depth insight of globalisation becomes important for higher education institutions. Furthermore, the impact of globalisation in higher education institutions can be seen in the demand for skilled professionals from diverse backgrounds to meet the demands of the labour market which would produce economic benefits on a national level.

Moreover, global challenges such as providing sustainable developmental goals including providing clean water and renewable energy for people in developing countries require collaborative efforts across disciplines and institutions on a global scale (Zakari *et al.*, 2022). The definition of globalisation and its relationship with higher education align with my study aims, as these concepts can be linked to the increased interconnectedness between cultures, societies, and education as well as the informants' experiences (Zhang and Lucy, 2019). Furthermore, the concept of 'internationalisation' closely related to globalisation has gained prominence in the global context of higher education.

Globalisation and the demand for skilled professionals have increased the desire for western educational qualifications across cultures and nations which have led to the increased student mobility to UK higher education institutions (Zhang and Lucy, 2019). For this study, most informants were previously international students who desired to study and work in the UK. Thus, these informants enrolled in UK universities. Furthermore, western higher education institutions widen their influence by establishing international campuses, collaborative degree programs and other cross-border initiatives which align to the study aims of this thesis, which focuses on the

movement of students, scholars, ideas and resources beyond international borders (Brooks and Waters, 2021).

In addition, the integration of digital technologies into higher education, as emphasised by Killick (2017) and Callaghan (2021), enhances the dimension of globalisation in this realm. The significance of technology is relevant to the study aims, highlighting the ways in which technology has provided a digital platform that enables global connections, collaborations between academic staff and students, a phenomenon that relates to the black women early career academics experiences who move beyond international borders in pursuit of their STEM careers.

2.1.3 Higher Education

The term 'education' can be categorised based on knowledge, skills, competencies and learning experiences provided (Marginson, 2022). The definition for 'education' differs across time and place. However, education is grouped into nine categories by the International Standard Classification of Education (ISCED): early childhood, primary education, lower secondary, upper secondary, postsecondary non-tertiary, short-cycle tertiary education, bachelor's or equivalent level, master's or equivalent level, and doctorate level (UNESCO Institute of Statistics, 2012). Furthermore, higher education is divided into bachelors, masters, and doctorate by universities.

According to Neuwirth *et al.* (2021), higher education encompasses post-secondary education, training, and research guidance provided by institutions that are recognised by state authorities as institutions of higher education. This definition covers various activities that a country considers to be higher education including those offered by traditional universities and graduate schools, as well as shorter-term education and

training courses such as polytechnics, junior colleges, and technical specialty schools. In addition, this definition includes correspondence courses that utilise information technology to reach a wider range of students. To corroborate this view, Moscardini *et al.* (2022) have identified the key roles played by higher education institutions, especially universities. These roles, according to the authors, include education, research, and societal contribution. These functions are interrelated, with research facilitating a higher standard of education, and education developing the human resources required for research. Presently, higher education institutions are expected to contribute to society as well (Vital *et al.*, 2023). To avoid becoming "ivory towers," these institutions need to engage in activities that ensure the dissemination of knowledge back to society (Vital *et al.*, 2023).

Figure 2.1: Position of Higher Education within Educational Cooperation Areas (Excluding Non-Formal Education)

(Educational Institutions)	(Educational levels)	(Main Functions)

Graduate School University (Undergraduate) Junior College/Polytechnic Technical Training School Broadcast University Online University

Virtual University

Higher Education

Education
Research

Contributions to Society

High School (General/Vocational Education)

Junior High School

Secondary Education

Education

Elementary School   Basic

Education

Primary Education

Education

Kindergarten

Nursery School

Pre-school Education

Education

Care

Source: Adopted from JICA/IFIC (2002)

The historical development of higher education and its interplay with the demands of industrialisation, technological innovation, and societal advancement in Europe and North America plays a key role in understanding the contemporary global higher education landscape (Marginson, 2022). Subsequently, the post-World War II era marked a period of widespread expansion driven by the need for skilled professionals, economic growth, and the rise of mass higher education, shaping today's higher education landscape (Smith, 2020).

During the late 19th and 20th centuries, the expansion of universities in Europe and North America was driven by the demand for skilled professionals for the purpose of

industrialisation and technological innovation as well as an individual's desire for upward social mobility (Marginson, 2022). Likewise, during the post war era, there was a demand for skilled professionals in the labour market to improve the post-war economy, expand the welfare state and increase the numbers of higher education institutions in the UK (Smith, 2021). These events have shaped the higher education landscape, and this relates to the study aims of the impact globalisation has on increasing movement of student, scholars, resources and knowledge across international borders (Marginson, 2022). Based on this context, there is a demand for research that transcends the academic realms but addressed critical global challenges including social inequalities (Smith, 2021). This demand for a broader scope of inquiry has prompted new forms of mobilisation and collaboration, fostering a dynamic environment among universities and institutions worldwide (Smith, 2021).

The concept of 'international student mobility' plays a key role in global higher education which relates to the study aims. Most informants were international students who transcended cultural and geographical boundaries to pursue their desired STEM career (Jöns *et al.*, 2017). The link between international student mobility, migration, globalisation and higher education can be attributed to the motivations of these informants driven by economic and cultural factors. For instance, some informants relocated to the UK from their respective home countries for the pursuit of a 'better life' for themselves and their families. Drawing on the genealogy of the context, these motivations to study abroad for economic gain can be traced back to neo-liberal ideals of personal success as well as to promote capitalism, providing skilled professionals to the labour market and colonialisation that emphasis the superiority of the western

education system (Olsen, 2019). These ideals have influenced the social and cultural expectations of children in their developmental years. Furthermore, these expectations have impacted the motivations and aspiration of the informants in this study (Olsen, 2019). International student mobility has been increased with the following factors including the widespread use of information technology and affordability of travel has enabled students to pursue their education trajectory beyond geographical and cultural boundaries (Marginson, 2012). According to UNESCO Institute of Statistics (2018), the numbers of internationally mobile students rose from 3.9 million in 2011 to 4.85 million in 2016. Several reasons have been attributed to the rise in extant literature. These include the neoliberal funding regimes that require institutions to increase revenues from international student fees, global labour markets which tend to place a high premium on skills, the formation of cosmopolitan identities that tend to shape individuals' aspirations and identities (Tran and Gomes, 2017; Patel, 2022; Deets, 2023). Prior literature has shown that there is a link between international student mobility and international labour market migration with many students migrating to host countries and contributing to the labour market in different areas. The destinations and origins of international students and labour force vary from country to country and region and region. Recent data by Organisation for Economic Corporations and Development (2022) reveals that only five English-speaking countries (the United Kingdom, United States, Canada, Australia, and New Zealand) host more than 55% of the global total of international students. Similarly, newly industrialised countries and developing countries with growing disposable income account for a large share of students, who go abroad for higher education

(Tran and Gomes, 2017). This trend is exemplified by China and India, which accounted for a combined total of 28.7% of outgoing international students in 2018. Another trend in international student flows is towards regionalisation, an increase in students who leave their home country but stay within the larger geographic region (Wai Lo and Chan, 2020). The growth of regional mobility flows has been facilitated by regional policy initiatives such as the Economic Commission of West African Countries (ECOWAS), the European Higher Education Area, and the Association Southeast Asian Nations mutual recognition arrangement (Hou and Du, 2019). The link between regional and global dynamics offers a valuable contextual lens through which my study on black women's experiences in STEM fields gains further significance. By understanding the patterns of international student mobility and the factors influencing their choices, a broader perspective on the global landscape that these academics navigate is gained.

There are several qualitative empirical studies that have examined the reasons for transnational education and the mobility of students, faculty, and research as well as the challenges facing this phenomenon. The first study in this regard is Ayling (2015) who reviewed the processes that Nigerian elites use to safeguard and elevate their children's social class. Ayling (2015) focused on the elite Nigerian parents residing in Nigeria who ensured that their children attended their primary and secondary education in elite boarding schools in the UK. Boyd (1973) mentioned that there are nine features of elites in modern democratic society that were used to create a sampling framework to recruit parents, including high occupational positions, a distinct lifestyle, group consciousness, exclusiveness, functional capability, and moral

responsibility. To gain access to this group, intermediaries who knew these parents were used and a snowball sampling strategy was created as some parent participants recommended others for the study. Thirty-nine participants were recruited, including twenty-six parents and thirteen gatekeepers. The study found that the ratio of Black to White pupils in a school is a significant factor influencing parents' school choice in the UK. The data showed that these parents prefer schools with fewer Blacks, particularly Nigerians, and wanted their children to be "one of the very few Nigerians" attending these schools. The study argued that parents seek "minority status" for their children to achieve a sense of exclusivity, which is a form of symbolic capital from a Bourdieusian framework. Additionally, not all parents had elite backgrounds, but they sent their children to UK-based private boarding schools to transform them into "respectable gentlemen and ladies" (Boyds, 1973).

Ayling (2015) argues that acquiring a refined accent particularly that of the white British upper class was important to these parents as it bestowed on their children the attributes of excellence. Overall, the study concluded that elite Nigerian parents choose UK-based private boarding schools to enable their children gain access to white British lifestyles and practices which they believe will reproduce genuine elite identities in modern day Nigeria.

Ayling (2021) explored the motivations for transnational education and student mobility by examining the role of international education in maintaining class advantage in modern Nigeria. The research involved interviews with four middle-class fathers in Nigeria, recruited through snow-balling and purposive sampling strategies. Data was collected through questionnaires and semi-structured interviews, with the latter used

to gather qualitative data. Ayling's (2015) research, which is grounded in Bourdieuan theory of capital, holds notable relevance to the study. By examining the educational choices of middle-class Nigerian families, she uncovers how educational institutions, particularly higher education, play a pivotal role in preserving their social class identity and advantage. This aspect resonates with my investigation into the experiences of black women early career academics in STEM fields, as both studies delve into the intersection of education and social status.

Ayling's (2021) case study of four middle-class Nigerian fathers highlights their motivation for sending their children to western countries for education. These Nigerian parents believe that western education bestows certain valuable cultural capital that enhances their children access to lucrative opportunities in Nigeria and beyond. This relates to the informants' responses concerning their families migrating to the UK for 'better opportunities'. This alignment underscores the broader dynamics of educational mobility and how it can influence individuals' prospects and social positioning. Moreover, Ayling's paper underscores the influence of Western hegemonic discourse, which extols the 'west is best' ideology. This discourse's impact on educational decisions emphasises the relevance of considering global power dynamics and perceptions in my study. The focus on financial capabilities of both elite and middle-class parents participating in the international education market offers a valuable lens through which to understand the factors that shape educational choices and potential career pathways. Notably, Ayling's observation about the value of acquiring Canadian citizenship resonates with my exploration of how identity and international experiences intersect for black women early career academics. In

essence, Ayling's research provides a thought-provoking context that aligns well with my study's focus on the experiences of black women early career academics. The connections between educational choices, cultural capital, and social status bridge the two studies, allowing me to draw insightful parallels and contrasts that contribute to a comprehensive understanding of the complexities involved in educational and career mobility.

Additional studies conducted by Marginson (2018), UNESCO (2021) and Wilkins and Lan He (2022) are related to my study aims. These studies underpin the key role economic gain plays in the mobilisation and globalisation of higher education, a theme that is closely related to the study aims of this thesis. Marginson (2018), UNESCO (2021), and Wilkins and Lan He (2022) collectively emphasise how economic gain has assumed a key role in driving the process of attracting international students, fostering cross-border collaborations, and cultivating innovative Transnational Education (TNE). This relates to my study aims focused on the link between academic mobility and the advancement of black women in their STEM careers. The convergence of these studies aligns with my study aims that underscore the significance of economic motivations and aspirations in shaping academic and career choices (Marginson, 2018). Moreover, Marginson (2018) highlight that various developed countries are competing with each other to emerge the most prominent contributor to the knowledge production economy, and this has resulted in the global expansion of higher education landscape. Furthermore, this phenomenon aligns with the study aims of this thesis, as there is a link between international student mobility and meeting the increased demand for skilled professionals in the global labour market. These themes can be

closely related to the experiences of black women early career academics, who transcended geographical and cultural barriers in pursuit of the STEM career.

Another factor shaping the mobilisation and globalisation of higher education is the proliferation of cross-border collaborations between universities both locally and internationally. More countries are striving to increase economic growth through innovation and research. Thus, these countries collaborate with each other to access knowledge and skilled professionals (Teichler *et al.*, 2013). Consequently, there has been an increase in international research collaborations between government, industry leaders and universities aspiring for new developments in innovation and research. This relates to the study aims, as more international collaborations between universities will lead to the increase in knowledge exchange and collaboration between institutions. Furthermore, this could potentially impact the career trajectories of black women early career academics in the STEM field. These collaborations could lead to further exposure to diverse perspectives and innovative research methodologies, contributing to their career advancement.

In addition, universities strive to achieve global leadership in research and development through international partnerships and this could positively impact the academic landscape for underrepresented groups, such as black women in STEM. Further participation in international research collaborations may allow them to contribute their unique perspectives and expertise, fostering an inclusive and diverse research ecosystem that benefits from the informants 'insights. Participation in cross-border collaborations could facilitate the expansion of professional networks for black women early career academics in STEM fields. These networks could provide

avenues for mentorship, collaboration, and exposure to international research communities, potentially aiding their integration and progression within their respective fields.

Furthermore, Tran *et al.* (2021) argue that the expansion of transnational education (TNE) programs, facilitated by economic incentives, significantly contributes to the globalisation of higher education. These TNE initiatives empower students to pursue foreign university degree programmes without relocating from their home countries. This surge in TNE's popularity stems from an array of incentives, including the attraction of international students, cost reduction, and enhancements in the quality of higher education. Aligning with the study's exploration, these dynamics highlight the broader landscape of academic mobility and internationalisation, offering insights into the mechanisms that shape career pathways and experiences for under-represented groups, such as black women in STEM fields.

The discourse on international university rankings, championed by scholars like Hazelkorn (2014) Knight and de Wit (2016), and Marginson (2018), offers another avenue of relevance to my research. These rankings shape mobilisation and globalisation in higher education, influencing decisions made by students, academics, and policymakers about where to study, work, and invest. The competitive nature of international rankings system in the global knowledge production economy relates to the study aims of this thesis, highlighting the link between international student mobility and the pursuit of career advancement. Additionally, international rankings play a key role in shaping a global market for higher education, allowing students and faculty to make informed comparisons across countries and institutions (Marginson, 2018). This

phenomenon is closely related to my study aims as it reveals how black women early career academics in the STEM field engage within higher education institutions, particularly in the context of global rankings that shape institutional reputation and desirability.

The implications of these trends also extend to promoting internationalisation within universities, encouraging curriculum internationalisation, recruitment of international faculty, and forging partnerships with institutions worldwide (Knight and De Wit, 2016). This argument relates to my study aims of representation, diversity, and inclusion of underrepresented groups in the STEM field.

The Joint Academic Coding Systems (JACS) definition of STEM field includes subjects such as medicine and dentistry, biological science, veterinary science, agriculture, physical science, mathematics, computer science, engineering, technologies, architecture, building and planning. However, the definition of STEM varies both within and outside the government and from country to country. Furthermore, the definition of STEM education by the JACS was deemed unsatisfactory due to the narrow definition of STEM subjects. The Careers Research and Advisory Centre (CRAC) argues that the JACS definition excludes subjects including nursing, psychology, sports science and archaeological science from STEM education (House of Lords, 2012).

The issue with JACS definition of STEM subjects is that subjects including sports science and complementary science subjects are not considered traditional STEM subjects (House of Lords, 2012). Despite the numbers of graduates from these non - traditional STEM subjects that have been given the same value and weight as

engineering and chemistry (House of Lords, 2012). Arguably, these graduates do not have the same STEM skill-set as those who studied traditional STEM subjects to fulfill the demands of the labour market (House of Lords, 2012).

The government has distinguished between these subjects as hard or soft subjects, with newer courses including sports science and forensic sciences being categorised as soft subjects (House of Lords, 2012). However, due to the continually evolving disciplines within science and the difficulties surrounding the classification of subjects within (JACS), it can be difficult to disaggregate and classify courses under such headings (House of Lords, 2012).

STEM education involves the consolidation of four disciplines with two possibilities including input and output in education (Hasanah, 2020). The purpose of studying STEM subjects is to become problem solvers, innovators, inventors, self-confident, logical thinkers and technological literate to solve real world problems (McGee and Bentley, 2017).

The consolidation of four main disciplines in STEM education including physics, engineering, mathematics, and chemistry are based on neoliberal interests of universities to produce highly skilled graduates that will be recruited to fulfil the demands of the labour market and contribute to the economic and technological developments of a nation. However, other subjects including sports science is not widely considered to be STEM subjects because these subjects do not uphold the input-output neoliberal agenda in most UK higher education institutions. Neoliberalism refers to increased privatisation, reduced government spending and marketisation of public good for profit making (Friedensen *et al.*, 2021).

Neoliberalism's impact on science can be seen in the positioning of students as consumers in higher education and as products to be sold to future employers in the workforce or further neo-liberal knowledge production in academia. Thus, all aspects of academic life concerning students are shaped by neo-liberal science education at almost every stage in academia (Friedensen *et al.*, 2021).

White supremacy refers to the superiority and dominance of the white race and the depoliticization of science are closely linked to neo-liberalism in UK higher education institutions (McGee and Bentley, 2017). White supremacy does not only impact inclusion and exclusion in STEM but it is also necessary condition for neoliberalism. Furthermore, white supremacy impacts the STEM field with less engagement to social issues in the STEM working environment (McGee and Bentley, 2017). Black women and other minority ethnic individuals are more likely to leave the STEM field at all career stages due to the unwelcoming environment for women and minorities to excel in science education.

Despite the increased demand for STEM graduates in the workforce, there are shortages of STEM graduates. Thus, the education systems need to improve the STEM literacy among students in secondary schools in order to retain students to work in the STEM fields (Archer *et al.*, 2015). STEM is conceptualised by students in terms of employability with the focus on individual's construction of identity as they prepare for employment (Okay-Somerville *et al.*, 2022). This is often reflected in students' patterns of thinking, emotion and career related behaviour (Okay-Somerville *et al.*, 2022). The STEM identity refers to the ways in which one views their ability to use STEM skills to become a STEM professional (Collins, 2018). STEM skills include

scientific literacy, logical thinking, mathematical skills set and general domain-specific cognitive abilities (McGee and Bentley, 2017). These skills are essential to the development of a STEM identity but notably, it is the individual, psychological and cultural factors that play a key role in the development of a student's STEM identity (Collins, 2018).

Lastly, the recent global challenges encompassing climate change, social inequalities, and the COVID-19 pandemic have significantly shaped the internationalisation of higher education landscape (Pashby *et al.*, 2020; Marinoni *et al.*, 2020; Bhattacharya *et al.*, 2021). These challenges have increased the demand for global solutions, creating a context that is related to my study aims. The emergence of global citizenship programs and the increasing adoption of digital technologies underpin the evolving nature of globalization of higher education, mirroring the dynamic environments in which the informants navigate their education and career trajectories.

2.1.4 Challenges facing Mobilisation, globalisation, and higher education.

This section examines the challenges facing mobilisation, globalisation, and higher education landscape. An important aspect of this exploration is to consider the higher education landscape in Africa in relation to the study's aims. Understanding higher education challenges in Africa holds significant relevance due to its interconnectedness with the global academic landscape. The challenges faced by African scholars highlight the similar issues encountered by their counterparts in western countries in the pursuit of knowledge economy and global collaborations.

Olaleye (2010) carried out a study on the challenges scholars in Africa face while contributing to the knowledge economy amid the forces of globalisation. These

challenges include inadequate funding, poor leadership and governance, 'brain drain' and poor living and working conditions in African countries amid the influence of globalisation. Addressing these challenges is key to comprehending the broader dynamics that shape the educational landscape. In addition, Olaleye (2010) argues that sub-Saharan African countries often allocate smaller portions of the Gross National Product (GNP), less than 0.3%, to research positioning them at lowest levels globally. This inadequate funding results in poor pay and working conditions for researchers as well as inadequate funding and infrastructure in Africa's higher education's sites. Consequently, this lowers trust in the government and contributes to the 'brain drain' of scholars in Africa and more emigration to developed countries (Lebeau and Oanda, 2020). Furthermore, the absence of research policies and effective management structured in African universities limits their capacity to effectively engage in productive research, innovation, and collaborations (Olaleye, 2010).

In addition to funding constraints, the prevailing social and political instability in many African countries further shapes the landscape of research productivity. Recognising the significance of good governance and autonomy, Olaleye (2010) emphasises that creating a conducive research environment hinge upon these foundational aspects. Moreover, the scarcity of skilled professionals, adept in research and knowledge management becomes a limiting factor for African researchers, impeding their ability to effectively compete for research grants (Lebeau and Oanda, 2020). To address this challenge, Olaleye (2010) advocates for the implementation of capacity-building

programs aimed at enhancing the research and knowledge management skills of university leaders.

In summary, the challenges faced by African universities as highlighted in the above sections provide insight on the workings of education in Africa. With regards to my study aims, these challenges faced by African scholars gives rise to the international student mobility to the UK universities. The mobility of students to the UK and European higher education institutions brings up issues like language barriers, cultural difficulties, and social segregation. Several sources (Beerkens *et al.*, 2016; Goodman, 2011; Keogh and Russel-Roberts, 2009; Powell and Finger, 2013) emphasise that language barriers are a major problem even within Europe, despite the increased use of English as a common language (Borghetti and Beaven, 2017; Camiciottoli, 2010; Tommasini *et al.*, 2017).

The issue of less feelings of belonging to host communities by international students could potentially impact the levels of social interactions between international students and locals in the community rather these international students could limit their socialisation with peers who share similar cultural and linguistic traits (Lomer, 2018). These factors could shape international student experiences as well as their choices in place of study.

International student mobility can have a positive impact on students' cultural awareness, intelligence, sensibility, empathy, adaptability, and intercultural competences, among other benefits (Roy *et al.*, 2019). However, short-term or credit mobility, which is the most common option within the European Higher Education Areas, provides limited opportunities for cultural achievements. Language and

organisational factors also hinder interaction with locals, which further prevents students from achieving cultural outcomes. Additionally, language and cultural differences have impeded the actual convergence of educational systems in the European Higher Education Area, creating factions among students (Bista *et al*, 2021). To alleviate these issues, it is crucial to coordinate student flows at a national level and develop academic organisation and accommodation solutions that promote interaction with locals and multicultural environments. It is also essential to develop formal and non-formal intercultural interventions that foster students' intercultural competencies (Bista *et al.*, 2021). By implementing these strategies, institutions can foster richer, more immersive experiences for international students, ultimately maximizing the potential for personal and cultural development that comes with studying abroad.

The mobilisation and globalisation of higher education, according to Marginson (2018), and UNESCO (2021) have also created challenges, particularly regarding cultural, racial, and gender issues. While internationalisation can lead to increased diversity and cross-cultural understanding, it could also create and reinforce social hierarchies and inequalities (Marginson, 2018). Cultural differences between international students and host communities have created tensions and misunderstandings (Deardorff, 2015). Additionally, the increased presence of international students leads to ethnocentrism and prejudice from host communities, particularly in countries where multiculturalism is not yet fully embraced (Lantz-Deaton, 2017). The globalisation of higher education has also led to issues of racial discrimination and inequality. The unequal distribution of power and resources in global academic networks can create

a hierarchical system where scholars from certain regions or backgrounds are undervalued or excluded (Stein and Oliveira de Andreotti, 2016). This can lead to the marginalisation of certain groups and perpetuate global inequalities. Gender issues have also been a concern in the mobilisation and globalisation of higher education. Women continue to face challenges in access to education, particularly in countries where traditional gender roles are still deeply ingrained (UNESCO, 2018). Furthermore, women are often under-represented in international research collaborations and leadership positions, despite comprising most students in higher education globally (UNESCO, 2018).

In summary, while the mobilisation and globalisation of higher education have created opportunities for increased diversity and cross-cultural understanding, they have also highlighted cultural, racial, and gender issues. The unequal distribution of power and resources, language barriers, ethnocentrism[1], prejudice, and gender inequality are some of the challenges that need to be addressed in the globalization of higher education. Other challenges posed by mobilisation and globalisation in the context of higher education as noted by Benneworth (2019), and Currie and Newson (1998) include changing roles and expectations of universities to the shifting landscape of governance and accountability as briefly discussed below:

Balancing Traditional Roles with New Demands: One of the key challenges facing universities in the era of globalization is the need to balance their traditional roles with new societal demands and expectations. According to Benneworth *et al.* (2017),

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[1]Ethnocentrism can be defined as the evaluation of other cultures according to preconceptions originating in the standards and customs of one's own culture. It usually involves deeming one's culture superior to a foreign culture, which can form a bedrock for how one interacts and inter-relates with others.

universities are expected to play a broader role in society beyond their traditional mission of teaching and research. This includes promoting social and economic development, contributing to public debate, and engaging with local communities. However, this expanded role can be difficult to reconcile with the growing competition and marketisation of higher education, which places greater emphasis on rankings, reputation, and financial sustainability (Marginson, 2018).

Changing Governance Landscape: Another challenge posed by globalisation in higher education is the changing governance landscape, with a shift towards greater autonomy and accountability for universities. As Sarrico *et al.* (2010) notes, there is growing pressure on universities to be more accountable for their outcomes and to demonstrate their value to society. This has led to increased calls for transparency, performance-based funding, and quality assurance mechanisms. However, this shift towards greater accountability can also be challenging, as universities must navigate complex regulatory frameworks and balance the demands of various stakeholders (Currie & Newson, 2017).

Need for Innovation and Collaboration: Globalisation has also led to increased pressure on universities to be more innovative and collaborative in their approach to teaching, research, and knowledge exchange. As Marginson (2018) argues, universities are expected to be more responsive to societal needs and to produce research that has practical applications. This requires greater collaboration between academic disciplines and universities and external partners such as industry and government. However, this increased emphasis on innovation and collaboration can

be at odds with traditional academic values, such as academic freedom and independence (Benneworth et al., 2016).

Unequal Impact on Developing Countries: While globalisation has brought many benefits to higher education, it has also had a mixed impact on developing countries. Some countries have benefited from increased access to resources and technology, while others struggle to keep up with the pace of change. This can lead to inequalities in the global higher education system, with some universities and countries falling behind in terms of research output, quality, and reputation.

Emphasis on Vocational Education and Training: Globalisation has led to a growing emphasis on vocational education and training in some countries, which can be at odds with the traditional academic values of higher education. This can lead to a narrow and utilitarian view of education, with universities being seen as providers of job training rather than places of learning and intellectual inquiry. This requires universities to adapt their curricula and teaching methods to meet the changing demands of the job market, while also maintaining a broader vision of the purpose of higher education.

The challenges posed by mobilisation and globalisation in higher education, as discussed by Benneworth *et al.* (2016), hold significant relevance to my research aims. First, the changing roles and expectations of universities due to globalisation can directly impact the experiences of black women early career academics. Balancing traditional roles with new societal demands creates a dynamic where these academics may navigate not only their academic responsibilities but also engage with broader

social and economic development goals, public engagement, and community involvement. Understanding these dynamics in the higher education landscape could impact the complex experiences of black women early career academics in STEM fields.

In addition, the shifting landscape of governance in higher education could potentially impact black women early career academics in STEM fields. The increased demand for accountability from UK universities could potentially worsen the experiences of black women within the academy. Considering that, navigating complex regulatory frameworks and balancing stakeholder demands might disproportionately affect black women's experiences. Additionally, the emphasis on innovation and collaboration can intersect with issues of race and gender, potentially influencing how black women's contributions are recognised and valued.

Finally, these challenges facing international students in their host communities relate to my study aims. This includes issues of cultural and language barriers and less feeling of belonging to the host communities could potentially impact the success of international students within the academy. Most informants reported feeling isolated and lacking networks during their doctoral studies. Some of these informants were international students who transcended cultural and geographical barriers in pursuit of their STEM careers.

However, the changing landscape of higher education, where innovation and collaboration are emphasised, can impact how black women academics perceive their career trajectories. Striking a balance between adapting to the changing demands of the job market and maintaining a broader vision of the purpose of higher education

aligns with my aim of exploring how these women conceptualise success in this context.

2.2 Blackness, gender, and inequality

This section focuses on the second broad theme namely blackness, gender, and inequality and how these concepts intersect with each other in relation to black women's experiences in STEM fields within UK higher education institutions.

These concepts blackness, gender, and inequality are complex and interconnected concepts that intersect in several ways. Historically, black people have faced profound levels of inequality including slavery, colonialism, and systemic racism that have significantly impacted mental and physical wellbeing as well as upward social mobility in wider society (Hall, 2015; Fanon, 2016; Andrews, 2021). Furthermore, these systemic injustices have permeated most social structures and institutions including education, employment, housing and healthcare which have significantly impacted the lives of people of colour as they continue to experience disadvantage due to persistent disparities (Hall, 2015).

Drawing on Crenshaw's (1991) intersectionality theory, black women face multiple oppressions and overlapping inequalities based on their race, gender, and class membership. This relates to the study aims that highlight the intersectional disparities based on race and gender that impacts black women's education and career trajectories in STEM fields. The historical injustices and persistent inequalities underpin the need for understanding how Blackness and gender shape the experiences of black women early career academics in STEM fields. The prevalence of race and gender disparity as well as its impact on black women within the academy

has been scarcely addressed in prior literature. The study's aims are to highlight the interconnection between race and gender disparities and how black women navigate these challenges in STEM fields.

2.2.1 Concept of Blackness

This study centres the experiences of Black women, acknowledging that the concept of "Blackness" is multifaceted and encompasses more than mere biology or political affiliation. While often associated with individuals of African descent, Blackness is a complex social construct shaped by historical, cultural, and political forces. Critical Race Theory (CRT) emphasizes that race is not a fixed biological category but a social invention used to categorize and often marginalize groups of people. Blackness, within the framework of CRT, is understood as a lived experience, encompassing the unique cultural practices, identities, and histories of individuals who have been racialized as Black.

This study recognizes that Blackness is not a monolithic experience but one that is diverse and nuanced. While acknowledging the shared experiences of discrimination and marginalization faced by Black people, it also recognizes the heterogeneity within the Black community, encompassing a range of ethnicities, nationalities, genders, sexual orientations, and socioeconomic backgrounds.

Blackness is not simply a matter of skin colour or ancestry; it is a dynamic identity that is shaped by individual agency, community belonging, and broader social structures. It is a source of pride, resilience, and cultural richness, as well as a site of ongoing struggle against systemic racism and inequality.

This study, therefore, adopts a multi-dimensional approach to understanding Blackness. It acknowledges the political significance of Blackness as a collective identity that can mobilize individuals for social change. It also recognizes the cultural dimensions of Blackness, encompassing the unique traditions, practices, and perspectives that have emerged from the African diaspora.

By centering the voices and experiences of Black women in STEM, this research aims to capture the complexity and richness of Blackness. It seeks to understand how these women navigate the challenges and opportunities presented by their intersecting identities, drawing upon their unique perspectives to shed light on the systemic barriers and biases that exist within higher education. Through this understanding of Blackness, this study contributes to a growing body of scholarship that challenges simplistic notions of race and advocates for a more inclusive and equitable academic environment.

2.2.2 The Concept of Gender

In a similar way to how 'race'; is conceptualised in this study, gender is also shaped by gender. Black feminists including Hill-Collins (1986) and Crenshaw (1991) theorised about 'intersectionality' meaning the multiple oppressions black women face based on their race, gender and class membership. This uncovers the power dynamics that has marginalised black women and omitted their experiences from mainstream sociology.

Gender encompasses diverse aspects including identity, expression, and roles. According to Eagly and Wood (2012), gender refers to the social, cultural, and psychological characteristics associated with being male or female. It encompasses

the societal expectations, roles, behaviours, and attributes that are typically associated with each gender category. The concept of gender has been widely studied in various fields, including psychology, sociology, and anthropology. In psychology, gender is often viewed as a social construct that is learned through socialisation processes (Klasen and Lamana, 2009). According to the social learning theory, individuals acquire gender roles and behaviours through observation, imitation, and reinforcement from their social environment (Bandura, 1977).

West and Zimmerman (1987), state that gender is not an inherent characteristic but a social construction that arises from interactions between individuals and society. This means that gender is created and maintained through our daily interactions with others, and it changes over time and across cultures. Gender is not limited to binary categories of male and female but encompasses a wide range of identities and expressions that vary in different cultures and historical periods (Connell, 2013). This implies that gender is not determined by biological sex, although biological factors play a significant role in shaping gender roles and stereotypes.

Gender development begins at birth and continues throughout life. During infancy and early childhood, children learn gender through socialisation[2] processes that involve exposure to gender-specific toys, clothes, and activities (Bussey and Bandura, 1999). As children grow older, they become more aware of gender roles and expectations and start to adopt gendered behaviours and attitudes. This process of gender socialisation is reinforced by various agents of socialisation such as family, peers,

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[2]Socialisation involves the process of absorbing information through experiences and essentially learning acceptable ways/manners of behaving in society. In race relations, it is during this period and process that racial prejudices are developed, which forms a bedrock for how people treat others, who are different from them.

media, and education (Eagly and Wood, 2013). Gender has a profound impact on our lives, influencing our self-concept, interpersonal relationships, and opportunities. Gender stereotypes and discrimination can limit individuals' potential and lead to unequal outcomes in various domains such as education, employment, and health (Krieger et al, 2023). Moreover, gender intersects with other social categories such as race, class, and sexuality, leading to multiple and intersecting forms of oppression and privilege (Crenshaw, 1991). This interconnected perspective is particularly relevant in understanding the subsequent sections of this thesis.

Gender is also an important factor in understanding social inequality and power dynamics. Gender discrimination and inequality are pervasive in many societies, with women often facing lower status and opportunities compared to men (Eagly and Wood, 2013). Feminist theories have highlighted the ways in which gender is used to justify and perpetuate unequal power relations between men and women (Connell, 2020). The study of gender has also led to the development of various models and frameworks for understanding gender identity and expression. The gender binary model, which divides individuals into two distinct categories of male and female, has been challenged by non-binary and gender queer identities that exist beyond this binary (Gulgoz *et al.*, 2024). In summary, gender is a concept that encompasses social, cultural, and psychological dimensions. It is a social construct that is learned through socialisation processes, and is shaped by biological, cultural, and environmental factors. Gender plays an important role in shaping individual identity and social inequality, and understanding its complexities is crucial for promoting equality and social justice. For this study, this is pertinent because the experiences of

Black women in STEM are shaped by the complex interplay of their racial and gender identities. The intersectionality of race and gender creates unique challenges and opportunities that cannot be fully understood by examining either category in isolation. This study aims to explore how Black women navigate the gendered norms and expectations within STEM fields, which are often dominated by white, middle-class, and male identities. By understanding the ways in which gender intersects with race and other social categories, this research seeks to shed light on the systemic barriers and biases that hinder Black women's advancement in STEM, as well as the strategies they employ to overcome these challenges.

2.2.3 Concept of Inequality

Issues of inequality are also important aspect of this study. The term inequality is usually seen as an uneven distribution of resources, power, and opportunities among individuals or groups in a society. In the context of education, inequality refers to the unequal distribution of educational opportunities and resources among different groups of individuals. These disparities can be based on a variety of factors such as race, ethnicity, socioeconomic status, gender, language, and disability status (Sen, 1995). There is burgeoning scholarly interest on the levels of equality, diversity and inclusion in the workplace (Tanjipiyapond *et al.*, 2022; Ryan, 2023; Hyman *et al.*, 2023). These studies have shown that inequality is conceptualised and reproduced through neoliberal education systems in which issues of race, class and gender intersect (Bramley and Morrison, 2022). The concept of inequality is contested but for the purpose of this study; social inequality with regards to race and gender will be explored. Inequality refers to the stratification or multiple disparities in material wealth

in society (Bollen and Jackson, 1985; Milanovic, 2005; Peterson, 2017). An important question in the study of inequality is 'inequality of what', in other words which inequality matters (Ridgeway and Markus, 2022). Social inequality continues to persist in education despite the egalitarian discourses within UK higher education institutions and the mass inculcation of generations in certain levels of education (Radulovic and Krstic, 2017). For instance, In the UK, the UNICEF (2018) found that even though the UK is the world's fifth largest economy, it ranks 23rd in educational inequality, setting the country behind less affluent countries such as Romania and Poland. In corroborating this view, Eddy *et al.* (2014), Osman and Hornsby (2016), Deem and McCowan (2018) have observed that there is substantial gap in the educational attainment including access to high-quality teaching between people from different socio-economic backgrounds in the UK and other western countries. Issues including ethnicity, economic disadvantage, disability, and gender shapes the educational attainment in the UK (Pfeffer, 2008; Hutchinson *et al.*, 2019). Pillas *et al.* (2014) argue that educational gaps tend to emerge during early childhood and the effects continue throughout a person's life affecting their entry into higher education, future employment, and income. Thus, this study explores how social inequalities with regards to race and gender shapes the career trajectories of black women entering the STEM field within UK higher education institutions. This focus is imperative due to the inherent interconnectedness between these two dimensions. Understanding how social inequality manifests in relation to race and gender will provide a contextual framework for exploring the experiences of black women early career academics in the STEM field within UK higher education institutions. By exploring the unique

challenges on these informants, the broader dynamics of social inequality within the academy are highlighted.

2.2.4 The intersectional issues shaping the representation of black women in the STEM field

The term 'intersectionality' refers to overlapping identities including race, class, and gender (Crenshaw, 1991). Hill-Collin's (1986) view echoed the earlier view of Crenshaw (1991) who argue that intersectionality refers to the ways in which different social categories such as race, gender, class, and sexuality intersect and interact with one another to create unique experiences of oppression and privilege. Black women have experienced significant under-representation and marginalisation in society due to intersectional issues including race and gender discrimination (Hill-Collins, 1986). Historically, Black women have been subjected to multiple oppressions including racism, sexism and social class discrimination which has resulted in their exclusion from various spheres of society such as politics, education, and the workforce (Hill-Collins, 2019). Even though black women have played critical roles in social justice movements, their contributions have often been overlooked or erased (Hooks, 1981). Black women are significantly under-represented in leadership positions. According to a study by the Center for American Progress (2018), Black women make up just 4% of elected officials in the United States, despite comprising 7.4% of the population. This under-representation is even more pronounced at the highest levels of government, with only one Black woman currently serving in the U.S. Senate and none serving as governors. Black women are also under-represented in the corporate world, with just 1.4% of Fortune 500 CEOs being Black women (Center for American

Progress, 2021). Furthermore, this issue needs to be addressed considering that there is evidence that diversity in leadership leads to better organizational outcomes (Hoang et al, 2022). In addition to political and corporate leadership, Black women are also under-represented in the academia.

According to the National Science Foundation (2019), women of color are under-represented in STEM fields compared to their representation in the U.S. population. Probable causes of this disparity include disparities in mathematics and science achievement among different racial and gender groups, as noted in studies by Berends et al (2008) and Ma et al (2015). Archer et al (2015) argues that the inadequate representation of black women in STEM fields can be attributed to lower teacher expectations and negative stereotyping that cause young black girls to choose social science subjects than science subjects. To corroborate this view, Wong (2015) and Bhattacharya (2011), the under-representation of ethnic minority individuals in STEM fields could be attributed to structural inequalities, educational gaps and inadequate access to information on pursuing a STEM career. This perspective resonates strongly within the broader context of the study. It provides insight on the unique challenges faced by black women early career academics and complements the aims of my study to uncover the complex interplay of race, gender, and location in shaping their education and career trajectories.

This study explores the reasons for the under-representation of black women in the STEM field with a focus on broader issues of promoting equality, diversity and inclusion within the UK higher education institutions. Bhopal (2018) argues that the under-representation of BME academics in senior positions can be traced back to the

attainment gap in education. This refers to the differences in the proportions of Asian, black African, Caribbean and white students attaining a good degree.

Despite efforts to widen access to universities and create a more diverse student body, there was a national difference of 13% in 2017/18 between the outcomes of White and BAME students (Advance HE, 2019). This gap is present even when controlled for prior attainment/entry grades. The 'Why is my Curriculum White?' movement was founded by students at University College London to tackle the whiteness that operates within the university curricula (Peters, 2015). There are wider concerns that higher education is racially biased, with white students and staff being the main beneficiaries, and those from ethnic minority backgrounds often disadvantaged or marginalised (Museus *et al.* 2008; Yosso, *et al.* 2009).

Micro-aggressions and implicit and subtle discrimination are significant issues faced by staff and students from ethnic minority backgrounds, and these can result in physical and mental stress (Bhopal, 2018). Recent focus on 'unconscious bias' and 'unintended discrimination' can make it difficult to challenge racial inequalities as they tend not to be easily detectable yet still shaping the career trajectories of marginalised groups in society. Bhopal and Pitkin (2018) argue that, despite the advances in policy making, BME academics still experience overt and covert forms racism within the UK higher education institutions. Thus, BME academics are moving to overseas higher education institutions due to the unfavourable conditions they face in UK higher education institutions. Furthermore, the under-representation of ethnic minority students and practitioners suggests that white privilege is reinforced in the STEM field, where those privileged by the system are consequently blind, unaware, and often

ignorant of their role in the reproduction of whiteness. By rejecting the central nature of race while remaining accustomed and non-critical forms of white supremacy can serve to worsen racial inequalities (Ahmed, 2012; Arday and Mirza, 2018; Ong *et al.* 2018).

The under-representation of black women in STEM fields is a critical concern for my research study, particularly because it highlights the broader issues of equality, diversity, and inclusion within higher education. The present shortages of black women in leadership positions may hinder the establishment and enactment of policies and practices that will address race and gender disparity within the UK higher education institutions. Several empirical studies have corroborated this argument, by exploring the experiences of Black women working in various spheres of society. One of the studies considered in this research is the work of Oster (2019), which addresses the under-representation of Black women in various societal domains and its significant implications for their social and economic mobility. In this context, their absence in leadership positions can hinder their ability to advocate for policies and programs that promote their best interests. Empirical studies have supported this notion, delving into the experiences of Black women across different sectors. To illustrate, Oster (2019) study focused on the field of engineering, where Black women's representation is notably lacking. The research aimed to explore how engineering institutions could adapt to better accommodate Black women. The study sought answers to two key questions:

(a) How does the educational environment within engineering contribute to the marginalisation of Black women?

(b) How can institutions modify their policies and procedures to improve the participation and experiences of Black women in engineering?

To address these questions, the study conducted interviews with 12 Black women who were studying engineering at a specific university, employing critical race theory and grounded theoretical approach to identify common themes in the interviews. The findings highlight how Black women articulate their experiences of marginalisation, feelings of isolation, strategies to cope with hyper visibility, challenges in forming study groups, and frequent encounters with micro-aggressions.

This research intends to amplify the stories and experiences of Black women, offering insights into how institutions can establish policies that attract and retain more Black women in the field of engineering. Some of the proposed approaches include promoting more inclusive messaging within engineering, creating supportive "counter spaces," and encouraging engineering educators to facilitate student study groups while recognising and addressing micro-aggressions.

The approaches mentioned by some of the study participants, such as promoting more inclusive messaging in engineering, creating, and supporting "counter spaces," and encouraging engineering educators to facilitate student study groups and recognise micro-aggressions, align with the challenges and concerns discussed in this study. These approaches directly address the issue of under-representation of Black women in STEM and the broader issues of equality, diversity, and inclusion within higher education. They serve as potential strategies to mitigate the negative impacts of under-representation and to foster a more inclusive and equitable environment for Black women in STEM fields. Furthermore, these approaches are aligned with the

broader discussions on differential degree outcomes, institutional biases, and the impact of racial inequalities on educational and career prospects. By addressing these issues directly, the proposed approaches aim to enhance the participation and experiences of Black women in STEM fields, while also contributing to the larger goal of combating racial inequalities in higher education. The empirical sections highlight the effectiveness and challenges associated with these strategies and provide valuable insights into their potential for creating a more inclusive and supportive environment for Black women in STEM.

Prior to the work of Oster (2019), Wright (2013) conducted a study on the enduring inequalities experienced by Black students in England. The research examined how young black people resist and transform their negative school experience by using grassroots civic citizenship. The study combined quantitative and qualitative data, including 100 narrative interviews conducted with 33 young people aged 14 to 19, who had experienced permanent school exclusion. The study also employed a snowballing sample method to access the young people for the research, and the meetings were held in different locations to engage and empower the young people. The research found that the young black people's narratives were suffused with notions of culture, individual agency, familial/community responsibility, subjectivity, and becoming. They unanimously agreed that they received support from their parents, which served as a powerful driving force for educational aspirations and participation. Importantly, this theme of parental support also resonated in the interviews with some of the participants in the data analysis section of this study. Just as observed by Wright

(2013), the significance of parental support has also surfaced as a consistent factor influencing the experiences and aspirations of Black women early career academics. Finally, the study also found that the young black men encountered black professionals who encouraged them to stay away from symbols that support negative stereotypes and provided them with emotional and educational support. This further echoes the significance of positive role models and mentorship within the Black community which also surfaced as a recurring theme in my research. Mentorship and guidance from established professionals, especially those who shared their racial and gender identities, played a key role. Just as the young Black men encountered black professionals who steered them away from negative stereotypes and provided invaluable emotional and educational support, the informants highlighted the significant impact of having mentors who understood their unique challenges and provided guidance in navigating the complex landscape of academia. This provides evidence for the importance of mentorship in empowering marginalised groups and fostering their educational and career aspirations and this relates to my study aims.

Furthermore, Paitek-jimenez *et al.* (2018) investigated the reasons for the under-representation of women in STEM fields. The authors conducted a meta-analysis of studies that investigated gender differences in faculty hiring, promotion, and tenure decisions in STEM fields. The study found that there was no evidence of gender bias in faculty hiring or promotion decisions in STEM fields. However, there were gender differences in the types of positions that women held within STEM fields, and women were less likely to be tenured. The study concluded that the under-representation of

women in STEM fields could be due to a combination of factors, including socialisation, stereotyping and the burden of childcare responsibilities.

Just as Wright's (2013) study highlighted the positive influence of mentorship from black professionals for young black men, Jackson and Ransom's (2021) research delved into the challenges faced by black women in academic positions. Their qualitative investigation, which employed semi-structured interviews with 15 black women academics in the United Kingdom, revealed a troubling pattern of systemic discrimination. These women faced not only a lack of mentorship but also exclusion from important professional networks. The link between the two studies provides evidence in the shared struggle of black individuals within academia to access the guidance and support necessary to overcome systemic barriers. These studies provide evidence that mentorship for black women is necessary to address race and gender disparities in the STEM fields.

The study conducted by Mehmet and Emrah (2020) adds a valuable perspective to the exploration of critical incidents, which is relevant to my research focus on the experiences of black women early career academics. While this study investigates critical incidents in the context of pre-service English as a foreign language (EFL) teacher, its emphasis on how these incidents shape identity and learning aligns understanding the experiences that influence the identity in relation to black women's experiences. By employing a critical incident analysis perspective, Mehmet and Emrah (2020) highlight the significance of critical incidents that individuals encounter within their social spheres. This resonates with my investigation into how the intersection of race, gender, and education shape the experiences of black women early career

academics. The notion that incidents occurring both within and outside educational contexts can influence identity development aligns with the broader societal influences that my informants navigate.

Moreover, the study's findings regarding the effects of critical incidents on language learning and teacher identity construction offer insights that can be applied to the research. Just as negative incidents can lead to transformative learning outcomes and contribute to identity development among EFL teachers, similar dynamics may be at play for black women early career academics in STEM fields. Inclusion of the Mehmet and Emrah (2020) study highlights the broader relevance of critical incidents and their potential as learning resources for identity development, not only within the context of EFL teaching but also within the experiences of black women academics. This connection underscores the importance of understanding how critical incidents shape the professional trajectories of individuals in various fields, providing a valuable framework for interpreting the experiences of my research participants.

The study conducted by Arday (2021) significantly resonates with the research aims and areas, particularly in the context of understanding the experiences of black women early career academics. Arday's (2021) exploration of the effects of racial discrimination on BME (Black and Minority Ethnic) faculty in the higher education sector, along with its impact on mental health, strongly correlates with the themes explored in this study. Just as Arday's (2021) study uncovered the persistence of racism and its various forms of discrimination affecting the mental health of BME staff, my own interviews with black women academics in STEM have also revealed similar

patterns. The impact of race and gender disparity on the informants suggests unique challenges that affected their mental wellbeing.

Arday's (2021) findings suggest that BME academics often encountered barriers in accessing mental health support in relation to their experiences of racial discrimination in the workplace. This relates to informant's responses in this study where they mentioned that there was inadequate mental health support and concern in their respective institutions. There is need for greater diversification of mental health support systems within universities, as advocated by Arday's (2021) study which closely aligns with my research aims. The experiences shared by my informants highlights the importance of developing inclusive and contextually relevant support mechanisms that address the distinct challenges faced by black women early career academics. In summary, Arday's (2021) findings highlight the significance of understanding and addressing the unique challenges faced by black women academics in STEM fields.

Another related study in the extant literature includes, Bhopal and Henderson (2021) conducted research on the Athena SWAN (ASC) and Race Equality (REC) Charter Marks in UK universities. Bhopal and Henderson (2021) examined the extent to which charter marks and policies shape the practices in UK universities. The ASC for Women in Science was formed in 2005 by combining the Scientific Women's Academic Network (SWAN) and Athena Project, which aimed to promote gender equality in STEM subjects. The ASC offers three levels of awards, at gold, silver, and bronze, and is based on four key areas - representation, student progression into academia, career milestones, and working environment for all staff. The researchers conducted

two studies, one exploring the impact of the REC and the other comparing the REC with the ASC. The study used qualitative research methods and included six UK universities, three of which had been successful in gaining a bronze award in the ASC and three in the REC. The researchers conducted 45 interviews and focus groups and used thematic analysis to identify themes and categorize the data.

The findings showed that both the Athena SWAN and Race Equality charter marks are valuable frameworks for equalities work in UK universities. The charter marks have enabled difficult conversations and prompted changes in institutional and departmental practices. The Athena SWAN mark has made gender equality a priority, while the Race Equality Charter has provided an important tool for discussing issues of race in the workplace. However, Bhopal (2020) argues that the universities tend to focus on gender equality because the Athena Swan Charter was associated with funding while overlooking race equality because it is yet to be associated with funding. Consequently, this has increased the numbers of middle-class white women in senior positions while overlooking men and women of colour.

Bhopal and Henderson's (2021) findings related to the informants' responses in the study, that highlighted the need for policies and practices to address race and gender disparity in STEM fields. Bhopal and Henderson's (2021) study's findings can be used to contextualise my participants' experiences and provide a broader framework to understand how policy initiatives shape the environment in which my research is situated.

The study conducted by Can and Kinikoglu (2021) investigating how early career academics navigated precarious conditions during the COVID-19 pandemic holds

significant relevance for my own research study. This is particularly relevant due to its focus on the challenges and vulnerabilities faced by early career academics within the higher education sector. While their study examines the impacts of the pandemic, it aligns with my exploration of the experiences of Black women early career academics in STEM fields, which includes the intersectionality of gender, race, and academia. By examining how early career academics navigate through uncertainties and inequalities in their working environment, the study offers insights into the broader issues of precarity, vulnerability, and inequalities within academia. The concept of precarity, encompassing gendered and racialised disparities as well as socio-economic factors, resonates with the concerns you are addressing in my research. The varying degrees of precarity experienced by the participants in their study echo the potential challenges faced by Black women academics in STEM, who might encounter additional layers of discrimination and marginalisation. Furthermore, the issues of precarity in academia that significantly impacts early career academics relates to my exploration of how precarity in academia is gendered and racialised (Arday, 2022). Thus, black women are more likely to be in temporary and zero hours' contract placing them in unsecure positions where they are rarely promoted and most likely to be made redundant (Arday, 2022).

The above findings are consistent with numerous other studies. For instance, the Equality Human Rights Commission (2019) has observed that UK universities have been criticised for not fully recognising the extent of racial abuse on their campuses. While almost half of universities are confident in their racial harassment procedures, it is believed that most discriminatory incidents experienced by Black women in STEM

field are under-reported. Despite national initiatives, such as the Race Equality Charter, concerns have been raised regarding its credibility and accountability. Racial inequality in higher education is often subtle, and individuals from ethnic minority backgrounds can experience micro-aggressions, which can cause exclusion, confusion, and a lack of self-confidence. Micro-aggressions can result in physical and mental distress, as well as cognitive dissonance due to discriminatory encounters. Recent focus on 'unconscious bias' and 'unintended discrimination'[3] can make it challenging to address racial inequalities since these acts are not easily detectable. Pilkington (2013) argues that there are less penetrative changes made to university practices despite the advances in policy making. Consequently, universities have adopted a culture of not raising awareness on these important issues including race and gender disparity in UK higher education institutions. Tate and Page (2018) argued that institutionalising unconscious bias as an excuse for white supremacy is part of white fragility and reinstates white racial equilibrium[4]. It was suggested that individuals from minority ethnic backgrounds need to be aware of racial internalisation to challenge institutional cultures of racism.

2.3 Conclusion

In conclusion, the systematic review examined the two broad themes including mobilisation, globalisation and higher education and blackness, gender, and inequality in relation to black women early career academics' experiences in the STEM fields. The existing body of literature has highlighted the profound impact of globalisation on

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[3] This is a phrase that encapsulates subconscious/ unconscious bias, which lays a foundation and is usually the culprit for unfair treatment of people from marginalised racial groups, even when it is not premeditated or intentional.

[4] This is a phrase that considers a societal state where race relations are relatively balanced either between the dominant and marginalised racial groups or within individual racial groups.

higher education institutions, revealing how knowledge mobilisation and engagement with the global landscape have transformed academia's landscape. Simultaneously, the review has underscored the intricate interplay of race, gender, and social class, with a particular emphasis on the experiences of Black individuals. This intersectional perspective has revealed the complexities of inequality and the various barriers that Black women encounter within higher education, especially in the STEM disciplines.

Prior literature reflects substantial progress in acknowledging the challenges faced by marginalised groups within academia. The extant literature on Black and Minority Ethnic students and early career academics has provided valuable insights in this study on the experiences of under-represented groups within the academy. However, there are gaps in the literature including the prevalence of inequalities despite the advances in policy making to support BME academics, the persistence of race and gender disparity in the STEM field and the gendered and racialised nature of precarity[5] in academia that significantly impacts early career academics. This study examines the above gaps in the literature to provide in depth insight on the experiences of black women early career academics.

While this literature review sets the stage for understanding the existing challenges, it also identifies areas for future study. The exploration of Black women's education and career trajectories in STEM within UK higher education institutions is an important next step. Thus, my research aims to examine the experiences of Black women early career academics, highlighting the barriers they face. By investigating how issues of

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[5]This terminology addresses the vulnerability, uncertainty and persistent insecurity that may be interwoven into the lived experiences of people from marginalised groups, especially with regards to how it pertains to intersectionality.

race, gender, and location shape their experiences, the study seeks to uncover the multifaceted challenges and opportunities that contribute to black women's unique career trajectories. Additionally, understanding how these individuals conceptualise success and advancement will provide insights into their aspirations and the broader structural changes needed to foster inclusivity and equitable advancement within STEM fields.

The study is situated within the UK higher education landscape and aligns with existing knowledge by addressing the critical gaps in understanding the experiences of Black women early career academics in STEM. By building upon the insights garnered from studies on minority ethnic students, early career academics, and the challenges posed by globalisation, this research takes a step further in uncovering the distinct challenges faced by Black women within this context. The themes of representation, discrimination, institutional support, and intersectionality emerge as the focus of this study, resonating with the broader themes discussed in the existing literature.

In summary, the literature review and the subsequent research aspire to contribute to the ongoing discourse on equality, diversity, inclusion, and social justice within higher education. By focusing on the experiences of Black women early career academics in STEM fields, the study strives to inform policy changes, institutional practices, and societal perspectives to create a more inclusive and equitable academic environment.

Chapter Three

Theoretical framework

Introduction

The previous chapter provided an overview of key scholars that frames this thesis. This chapter outlines the theories to be examined in this study. This qualitative study adopts a multifaceted approach, employing the life history method as the primary data collection strategy. Critical Race Theory (CRT) serves as the core analytical framework, but will be complemented by insights from decolonial theory, particularly the concept of coloniality of gender, racial neoliberalism, and Bourdieu's theory of capitals. This combined approach will enable a better understanding of how race, gender, social class, and location intersect to shape the lived experiences of Black women early career academics in UK STEM fields. The study draws on the theoretical lens including Critical race theory, decolonial thought, coloniality of gender, racial neoliberalism and Bourdieu cultural capital theory and habitus.

The study's objectives examine how the intersections of race, gender, and location shape black women early career academics experiences in the STEM field, within UK higher education institutions and how these informants conceptualise success and advancement in their careers. These theoretical lenses gives insight on how the intersections of race, gender and location shapes the career trajectories of black women early career academics in the STEM field within UK higher education institutions. The evidence and relevance of these theories to the informants' narrative accounts is seen in Chapters Eight and Nine.

3.1 Critical race theory [CRT]

This section outlines the definition, principles, and application of CRT to this study, CRT identifies the sources of power and privilege to western society. Critical Race Theory (CRT) emerged from legal studies as a transdisciplinary approach focused on race equity. The theory was originally developed from USA legal scholarship to provide a critical analysis of race and racism. Scholars of CRT, such as Hylton (2012) and Delgado & Stefancic (2023), argue that claims of objectivity and neutrality in the law overlook the structural inequalities in society, leading to the normalisation and perpetuation of racism. CRT attempts to show that western society is underpinned by systemic racism, white supremacy and whiteness which are key characteristics in the institutions, within western society (Hylton, 2012). CRT was originally developed for legal studies, but its application has since gained popularity in other disciplines including education (Bhopal and Pitkin, 2020; Gillborn, 2006; Ladson-Billings; 1998). The study draws on CRT to explore the experiences of black women early career academics in the STEM field within UK higher education institutions. By adopting CRT, the study looks to create a paradigm shift to the existing discourse on race. The study is guided by CRT, which emphasises the centrality and enduring nature of race and racism, highlighting the pervasive influence on societal structures. Second, it recognises the Intersectionality of race discrimination with other forms of oppression, acknowledging the interconnectedness of various dimensions of oppression. Third, CRT challenges dominant ideologies by interrogating and exposing the underlying power dynamics that maintain racial hierarchies. Fourth, it underscores the significance of experiential knowledge, valuing the lived experiences and perspectives

of marginalised communities. Finally, CRT is grounded in a commitment to social justice, advocating for transformative change to address systemic inequities.

CRT proposes that racism is deeply embedded in social structures that are normalised and invisible (Hylton, 2012). CRT suggests that racism is understood to be an everyday occurrence, more pedestrian rather than spectacular (Solórzano and Yosso, 2000). CRT uses basic principles including the centrality of racism, white supremacy, the voices of people of colour, interests of convergence and intersectionality. This study will focus on the most relevant principles including the centrality of racism, the voices of people of colour and intersectionality.

CRT suggests that racism is an enduring and inherent aspect of society, as discussed by Delgado and Stefancic (2017) who identify the significant impact of racism, both conscious and unconscious, as a fundamental force that shapes individual experiences and group outcomes. For instance, Ladson-Billings and Tate (1995) illustrate the CRT perspective in public schools by proposing that, if racism were isolated incidents, there would be varying levels of educational performance across schools rather than persistent inequalities based on racial lines. CRT acknowledges that racism is not merely an aberration rather it is a normal way in which society is organised in western countries (Bhopal and Pitkin, 2020, p.533).

Another principle is highlighting the voices of marginalised groups to produce counter narratives that further disrupt hegemonic narratives often promoted by the dominant race in society (Solórzano et al., 2001; Joseph-Salisbury, 2019). For example, this study uses the counter narrative of black women academics in STEM field within UK higher education institutions to disrupt the dominant narratives that universities are

meritocratic in nature devoid of any kind of institutional racism and bias. However, despite these assertions, racism and sexism persists in academia that is often believed to be a progressive field (Boliver, 2016).

Intersectionality is an important aspect of critical race theory, as no individual has a singular identity rather individuals have complex identities that overlap. This includes multiple ways in which various forms of oppression can come together at the same time (Rollock and Gillborn, 2011; p.5). Adopting an intersectional approach, allows for the exploration of differences within and between groups taking account of issues such as social, political and historical context, while maintaining awareness of racial inequalities (Rollock and Gillborn, 2011; p.5).

CRT theorists in the UK demonstrate how institutional policy making is used to further marginalise and discriminate against people of colour (Gillborn, 2006). Gillborn (2006) argues that, based on the principles of CRT, policy making, and policy enactment are examples of white supremacy. Gillborn (2006) further argues that education is an act of white supremacy because policy assumes and defends white supremacy through the priorities it sets, the beneficiaries it privileges and the outcomes that it produces (Gillborn, 2008). Gillborn (2006) also argues that it is no accident that policy making continues to marginalise and discriminate against people of colour. This is framed by previously established cultural, economic, and historical structures of racial domination, the continued promotion of policies and practices that are known to be racially divisive, thereby demonstrates the implicit intentionality in the education system. Gillborn (2006) argues that CRT is important, in understanding how structural processes in society through white privilege continue to marginalise and oppress

people of colour particularly in relation to whiteness matters. Bhopal and Pitkins (2020) argue that CRT does not assume that all white people are the same, but CRT does argue that all white people are beneficiaries of white supremacy.

 Some criticisms of CRT include the suggestion that most CRT scholars are often leftist radicals and have been accused of anti-semitism. Cabrera (2018; p.213) argues that CRT does not provide testable hypotheses and measurable outcomes, while treating the narrative from people of colour as a form of data. Thus, it cannot be used as a standalone theoretical framework because it is not a rigorous method of analysis as it involves only stories or narratives. CRT tends to over-emphasise the endemic nature of racism in society but offers no account in terms of the nature of this oppressive social force within their central tenets. There is no 'mental model of racism' embedded in CRT (Cabrera, 2018; p.213). Finally, critics of CRT were suspicious of the movement's tendency to question the presence of objective truth. Views like truth, objectivity and meritocracy are all challenged by CRT scholars who identify the often-invisible workings of white supremacy. For example: the ways whites enjoyed a form of affirmative action within higher education through policies such as legacy admissions (Cabrera, 2018; p.214).

While CRT has been criticized for its rejection of objectivity and its focus on narrative as a form of data, this study embraces the value of experiential knowledge and acknowledges the limitations of traditional positivist approaches. Traditional positivist approaches, while valuable in certain contexts, have several limitations that can be particularly problematic when studying complex social phenomena like the experiences of Black women in STEM:

1. Reductionism: Positivism tends to reduce complex social phenomena to quantifiable variables, often overlooking the nuanced and subjective aspects of human experience. This can lead to an oversimplification of the factors that contribute to inequality and marginalization, failing to capture the full complexity of individuals' lives and the structural forces that shape them.

2. Objectivity and Neutrality: Positivism strives for objectivity and neutrality, assuming that researchers can remain detached from the phenomena they study. However, this stance is increasingly challenged, especially in social science research, as it fails to acknowledge the researcher's positionality and potential biases. In the context of studying Black women in STEM, a positivist approach may overlook the researcher's own experiences and perspectives, potentially leading to a misinterpretation of the data.

3. Limited Focus on Context: Positivism often prioritizes generalizable findings and universal laws, neglecting the importance of historical and cultural context. In the case of Black women in STEM, their experiences are deeply rooted in historical legacies of colonialism, slavery, and ongoing racial discrimination. A positivist approach may fail to fully capture the significance of these contexts in shaping their experiences.

4. Neglect of Subjective Experience: Positivism primarily focuses on observable and measurable data, often neglecting the subjective experiences and interpretations of individuals. This can be particularly problematic when studying issues of race and gender, as the lived experiences of marginalized

groups are often shaped by emotions, perceptions, and internalized biases that

may not be easily quantifiable.

5. Limited Scope for Social Change: Positivism tends to focus on describing and

explaining phenomena, rather than actively seeking to change them. This can

be a significant limitation when studying issues of social justice and inequality,

as it may not lead to actionable recommendations for addressing systemic

problems. By contrast, this study embraces an interpretivist philosophy, which

acknowledges the subjective nature of reality and the importance of

understanding the meanings and interpretations that individuals ascribe to their

experiences. By centering the voices and experiences of Black women, this

research seeks to contribute to a comprehensive understanding of the complex

issues surrounding race, gender, and inequality in UK higher education.

3.2 Decolonial Thought and coloniality of gender
This study draws on decolonial thought and coloniality of gender to reveal the power

dynamic between black women and the broader society. Furthermore, this study

explores how the power relations in predominantly white society shapes the career

trajectory in the STEM field within the UK higher education institutions.

The term 'decolonial thought' examines how people of colour were affected by colonial

wounds. This theory was first used in the mid-20th century, and it demonstrates the

power dynamics between British colonial empire and the commonwealth countries

(Meghi, 2022). As noted in extant literature, decolonial theory was pioneered by Latin

American scholars like Walter Mignolo, who criticised Eurocentric perspectives on

modernity (Lugones, 2010; Connell, 2014; Simpson, 2011). The theory argues that

modernity is not a universal phenomenon, but rather a product of European colonialism (Escobar, 2010; Lugones, 2010; Connell, 2014). This colonial project imposed western knowledge systems and social structures on colonised societies, erasing and devaluing pre-colonial ways of knowing and being (Mignolo, 2007).

A key concept within decolonial theory is the coloniality of gender, developed by scholars like Lugones (2008). This concept, according to Krogstad (2015), Manning (2017), and Liu (2018), focuses on how colonialism reshaped gender relations across the globe. It highlights how western, patriarchal gender systems were imposed onto colonised societies, creating a global hierarchy where women, particularly those in developing countries, became doubly marginalised by race and gender. Pre-colonial societies often had more fluid understandings of gender, but colonisation disrupted these systems, leading to the subordination of women and the erasure of alternative gender conceptions (Manning, 2017; Liu, 2018).

The synergy between decolonial thought and coloniality of gender gives insight on how the experiences of black women early career academics are shaped by intersectional issues of race, gender and location. This suggests that western colonisations have shaped the gender conceptions in developing countries which results in the subordination of black women. This is pertinent for this study because it provides a framework for understanding how the legacies of colonialism and the coloniality of gender continue to shape the experiences of Black women early career academics in the UK. By examining the power dynamics inherent in predominantly white institutions and the devaluation of non-Western knowledge systems, this study can shed light on the systemic barriers and biases that these women face in their

pursuit of STEM careers. This theoretical lens can help to uncover how the intersectionality of race, gender, and location creates unique challenges for Black women in STEM, ultimately informing efforts to promote greater equity and inclusion within higher education.

The following factors listed below shapes black women early career academics in the STEM field within the UK higher education institutions:

i.   **Race**: Black women are largely underrepresented in the STEM fields within UK higher education institutions and they are negatively stereotyped.

ii. **Gender**: The coloniality of gender reinforces patriarchal structures within academia, creating unique challenges for black women to achieve the same rewards and recognition in comparison to their white male colleagues.

iii. **Location**: Black women studying in the UK have less feelings of belonging in their host country due to the colonial past and the positioning of black individuals as outsiders in spaces reserved for elite white men (Bhambra, 2014).

Drawing on a decolonial lens gives insight on how these factors intersect to shape the experiences of black women early career academics in the STEM field within UK higher education institutions. Decolonial thought provides a theoretical lens to understand the struggles black women face in their career pursuit. These negative experiences cannot be viewed as an individual encounter with racism and sexism rather, it is part of a broader social and historical context. Decolonial thought seeks to dismantle Eurocentric episteme and dominance in wider society to achieve a more equitable and inclusive society (Lugones, 2010).

Decolonial thought offers a critical framework for dismantling the whiteness of the university staff body and addressing the overrepresentation of ethnic minority staff in service roles (Doharty *et al.*, 2020; Johnson, 2020). When combined with Critical Race Theory (CRT), decolonial thought provides a well-rounded perspective on the present impact of institutionalised racism on black women scientists in the UK. This perspective can be traced back to the history of coloniality, empire, and slavery, and their global impact on post-colonial citizens (Meghji, 2022). Decolonial thought also helps to challenge the inherent whiteness within science curriculums and pedagogy. This hegemonic whiteness often excludes black women scientists and their contributions (Carlone and Johnson, 2007). Furthermore, it can illuminate the ways in which lower teacher expectations and racial stereotyping contribute to the exclusion of young black girls from scientific pursuits in higher education. Decolonial theory offers a powerful lens for understanding the experiences of black women academics in the STEM fields within UK higher education institutions. By highlighting the historical and ongoing effects of coloniality, decolonial theory can inform interventions that promote equity and justice within academia and beyond.

3.3 Bourdieu's Cultural Capital Theory and Habitus

This work has also been shaped by the work of Bourdieu - specifically on educational inequality, class and capitals. Bourdieu (1984) states that concepts including 'habitus' [norms, values, and attitudes of a particular social group] and 'capital' (resources which can be economic, social, cultural, and symbolic) are often produced through the interaction of privilege and domination that reproduces inequality in society. Bourdieu's development of the notion of capital has been useful in the field of sociology

and cultural studies. The concept of 'capital' has been useful as an empirical and theoretical framework for the exploration of the processes of embodiment and accumulation of knowledge and reproduction of agents within the social field (Bourdieu, 1977). Bourdieu (1986; p.242) argues that the social world is an accumulated history which requires the introduction of the notion of capital to highlight the importance of accumulation in the social field. Capital can be defined as the accumulation of resources that are monopolised and transferable from one generation to another (Lareau and Weininger, 2003; p.565).

This study discusses the forms of capital that are most relevant including cultural capital and habitus. Bourdieu (1986) states that cultural capital is simply a form of capital that is easily convertible into economic capital (material assets or money) and maybe institutionalised in the form of educational qualifications. Cultural capital includes attitudes, preferences, behaviours, and goods used for direct or indirect social and cultural exclusion (Lareau and Weininger, 2003). Cultural capital represents the consumption and acquisition of several cultural goods including pictures, books, dictionaries and instruments (Lamont and Lareau, 1988). Cultural capital theory is influenced by Marxism, which suggests that the culture of the dominant class is no greater than that of the working class (Giddens and Sutton; 2021).

Bourdieu *et al.* (2010) developed the concept of 'cultural capital' to examine the impact of culture on the social stratification system and the relationship between action and social structure. These scholars were first concerned with how social inequality was reproduced by the educational system and family socialisation due to the structure of the distribution of 'cultural capital' among these classes (Bourdieu, 1977). For

example, Bourdieu and Passeron (1977) argue that schools are not neutral institutions but reflect the experiences of the dominant class. Children from this class enter schools with key social and cultural cues while working class students must acquire knowledge and skills to negotiate their educational experience after they enter school (Lamont and Lareau, 1988; p.155). Working-class students may acquire the social, linguistic, and cultural competencies that are features of the middle class, they may not achieve the natural familiarity of those born to the elite classes (within a comparable time frame) and are academically penalised on this basis. Lamont and Lareau (1988; p.155) argue that the differences in academic achievement are normally explained by the differences in ability rather than cultural resources transmitted by the family, social transmission of privileges is itself legitimised. Arguably, academic standards could be alienating working class children and these 'so called' meritocratic institutions help to create systems of social stratification (Bourdieu and Passeron, 1977). These patterns of individual school discriminatory behaviour are not isolated cases rather it is institutionalised.

Following the earlier work of Bourdieu and Passeron (1977), the concept of 'science capital' was developed to address the reproduction of social inequalities in society proposing that relations of domination and privilege are produced through habitus (norms, attitudes and behaviour associated with a social group) with capital (resources including economic, social, cultural, and symbolic) and field (social contexts) (Archer *et al.*, 2015; p.204). Science capital refers to the conceptual tools that help us understand the uneven patterns across different social groups in children's likelihood and aspirations in studying science subjects. The concept of 'science capital' is quite

relative depending on the social status of the one who is possessing or deploying it and in what context (Archer *et al.*, 2015; p.204). Science capital is an important theoretical tool to examine how black women early career researchers perceive a science career as being for them and the ways in which their perceptions of STEM careers are shaped by intersections of race, class, gender, and location.

Cultural capital over-emphasises the role of class inequality rather than taking an intersectional approach of other identities and inequalities including gender and race inequality. Edgerton and Roberts (2014; p.199) argue that habitus is an overly deterministic construct that hinders innovation, social change and agency. Socio-economically disadvantaged individuals are socialised into dispositions that make them think and act in ways that reproduce the conditions of their disadvantage. Furthermore, Bourdieu's cultural capital theory suggests that human agents are passive and cannot affect the necessary changes they want to see on the institutional level. The structural and agency debate have mutual effect on each other, even though Durkheim argues that societal structures have broader impact on individuals, with individuals having limited power to effect the desired social changes in wider social structures in their environment (Giddens and Sutton, 2017).

This is pertinent for this study because it enables an examination of how Black women early career academics in STEM may have been disadvantaged by the unequal distribution of cultural and science capital. Their experiences in education and the workplace may be shaped by their habitus, which may not align with the dominant norms and expectations of the STEM field. This study will explore how Black women navigate these challenges, drawing upon their resilience and agency to create their

own paths to success. By understanding the role of cultural and science capital, this research can inform interventions aimed at levelling the playing field and ensuring that all individuals have equal opportunities to thrive in STEM fields, regardless of their social background.

While Bourdieu's theory offers valuable insights, this study also acknowledges its limitations. The concept of habitus can be seen as overly deterministic, potentially overlooking individual agency and the potential for social change. Additionally, the theory has been criticized for its emphasis on class inequality, often neglecting the intersecting dimensions of race and gender. This study will address these limitations by adopting an intersectional approach that recognizes the complex interplay of race, gender, class, and other social categories in shaping the experiences of Black women in STEM.

3.4 Racial Neoliberalism

Racial Neoliberalism is a framework that complements Bourdieu's insights on social class (Bourdieu, 1986) to provide a comprehensive analysis of the challenges black women in STEM face in the UK. Extant literature shows that racial neoliberalism theory emerged in recent decades to examine the complex relationship between race and capitalism in the contemporary world. Kundnani (2021) noted that Racial Neoliberalism Theory offers valuable insights by:

- **Exposing Persistence of Racialised Structures:** Neoliberal ideologies often promote colour-blindness, yet racial inequalities persist through subtle and systemic means. Racial neoliberalism theory sheds light on how these

inequalities continue to operate within seemingly meritocratic frameworks (Kundnani, 2021).

- **Demystifying Meritocracy:** Neoliberal discourse emphasises individual responsibility and meritocracy, as the primary determinants of success. Racial neoliberalism theory critiques this perspective, demonstrating how systemic racism disadvantages certain groups and obscures the role of historical and ongoing power dynamics in shaping opportunities (Fleras, 2022).

- **Connecting Globalisation and Racial Inequalities:** The theory explores how the rise of supranational institutions and deregulation associated with neoliberalism (e.g., global supply chains) can contribute to the reproduction of racial inequalities across different geographical contexts.

In light of the above, racial neoliberalism provides a valuable framework for understanding the experiences of Black women in STEM fields. STEM fields as noted in extant literature, are often characterised by:

- **Privatisation of Opportunity:** The emphasis on individual achievement within a neoliberal framework overlooks the historical and ongoing effects of colonialism and slavery that disadvantage Black women in accessing quality education, mentorship, and professional opportunities.

- **Obscuring Discrimination:** The focus on meritocracy within STEM fields can potentially obscure the role of implicit bias and discriminatory practices within institutions, hindering the advancement of Black women.

- **Limited Diversity Initiatives:** Deregulation and privatisation can lead to a lack of support structures and diversity initiatives specifically designed to address racial inequalities in STEM fields.

Bourdieu's Social Class Analysis offers a complementary framework in this study. The concept of habitus provides valuable insights into how Black women in STEM might carry the weight of social and cultural disadvantages that influence their academic and professional journeys. These disadvantages can include limited access to educational resources, social networks, and cultural experiences that prepare students for success in STEM fields. Additionally, Bourdieu's notion of cultural capital highlights how dominant cultural norms within STEM fields can disadvantage those from non-dominant backgrounds. Racial neoliberalism builds upon this foundation by demonstrating how these class dynamics are intricately linked to racialised structures, within supposedly meritocratic systems.

While class analysis offers valuable insights, it is crucial to acknowledge its limitations (intersectionality) in this study. The experiences of Black women in STEM are shaped not solely by class, but also by the intersection of race, gender, and potentially other factors. A comprehensive understanding requires an intersectional approach that acknowledges these overlapping systems of oppression.

3.5 Why are these theoretical lenses relevant in this study?

This study drew on theoretical lenses including CRT, decolonial thought, coloniality of gender, racial neoliberalism and Bourdieu capital theory. Each theoretical lens provides in-depth insight on how black women are disadvantages by structural

inequalities and systemic racism that positions black women as outsiders in spaces reserved for elite white men. This is evidenced in the ways, existing structures and systems determined by coloniality including global inequality, longstanding racism and sexism and racial-neoliberalism have shaped the unique challenges faced by black women in the STEM field within UK higher education institutions. This study uses Goodson and Sikes (2001) genealogy of the context approach, to trace back these issues to colonial legacies of the British empire (see Chapter five). These theoretical lenses show the interplay of race, structure, agency, gender and neoliberal discourses shapes the experiences of black women in the STEM field within UK higher education institutions.

For example, CRT will provide a critical foundation for examining systemic racism within STEM. It allows me to explore how seemingly race-neutral policies and practices can perpetuate racial inequalities. Building on this, decolonial thought would help expose the historical roots of these inequalities by tracing them back to coloniality meaning the aftermath of 'colonial administration' (Maldonando-torres, 2007). This analysis reveals the uneven power relations between dominant society and black women within UK higher education institutions in recent times. Coloniality of gender, an effect of 'colonialism' uncovers how western patriarchy has shaped gender relation in previously colonised countries. Furthermore, Bourdieu's theory highlights how social structures like schools reproduces inequality because their values are similar to that of the elite class. This is a form of 'symbolic violence' to the working class. For instance, most black women belong to working class families and possess inadequate access to resources and networks required to advance throughout the STEM pipeline.

Racial Neoliberalism complements this analysis by exposing how seemingly meritocratic systems within STEM fields can obscure the role of implicit bias and discriminatory practices (Kundnani, 2021). It highlights how neoliberal ideologies of individual achievement can mask the ongoing effects of historical and contemporary racism on opportunities in STEM careers.

The following chapters (Eight and Nine) drew on this multifaceted theoretical lens to analyse the narratives of Black women in STEM fields. This analysis will explore how these black women early career academics in the STEM field within UK higher education institutions navigate systemic racism, institutional barriers, and limited cultural capital, as well as their strategies for resistance and resilience.

3.5 Conclusion

This chapter has outlined the origins, definitions, application, and criticisms of the theories to be examined in this study including CRT, Decolonial Thought, Racial Neoliberalism, Bourdieu's Cultural Capital Theory and Habitus. By combining these theories, the interplay between race, structure, and agency in relation to how black women navigate systemic racism and institutional barriers in the STEM field within UK higher education institutions are uncovered. There is further examination of the informants' accounts through this theoretical blend of CRT, decolonial thought and Bourdieu's theory, to examine the ways in which power structures, oppression shapes Black women's education and career trajectories, as well as the resistance to these challenges. In the following sections (also see chapter eight and nine), the research questions and objectives posed in this study are discussed, based on the analysis of informants' narrative account through these theoretical lenses.

Chapter Four
Methodology

4.0 Introduction

This chapter outlines my chosen research method, philosophical assumptions, epistemological considerations, ethical dimensions, and the rationale for the overall study. As mentioned above in the introduction, my study aims examines the life histories of six black women early career academics in the STEM fields. This chapter provides justifications for the use of the life history influenced approach alongside other decisions concerning data collection, sampling strategy and data analysis.

This study draws on the conceptual tools including Critical Race Theory and life history influenced approach which emphasise giving 'voice' to marginalised groups namely black women within the academy. By combining Critical Race Theory and life history influenced approach, the interplay between race, structure and agency is uncovered with regards to how broader racialised and gendered social structures shapes the informant's identities, experiences and subjectivities. The justification for using the life history influenced approach is to provide in-depth analysis on the informant's narrative accounts and 'locate' these life stories within the broader social, political and historical context in which these experiences occurred.

In summary, this chapter covers several essential aspects of the research methodology, including the research philosophy, design, strategy, data sources, collection methods, instruments, and sampling techniques. Additionally, it explores

data analysis and presentation methods. Following Saunders et al (2009) recommendation, this study utilises the "onion" research design, which outlines the critical questions a researcher must answer during the research process. Specifically, this study addresses the research philosophy, approach, choice of life history methods, rationale for combining CRT and life history methods, and data analysis techniques. It also discusses the data collection procedures, such as participant recruitment methods, selection criteria, and recording techniques, as well as any challenges encountered. In addition, this chapter covers discussions about the ethical considerations as well as the researcher identity, positionality and truth claim in this study.

4.1.1 Research Design

For this life history influenced thesis, I adopted narrative inquiry to collect and analyse evidence gathered from the informants. The difference between narrative inquiry and life history influenced approach is that, narrative inquiry similar to other oral traditions including narrative analysis, autobiography and narrative storytelling provides a longitudinal analysis of informant's life story (Litchman, 2013). However, life history influenced approach is slightly different as it 'locates' these life stories within the broader social, political and historical context in which these experiences occurred.

 According to Clandinin (2013,p.76) 'narrative inquiry is an approach to studying human lives which emphasised lived experiences as an important source of knowledge and understanding'. To Connelly and Clandinin (1990), narrative inquiry is a study of ways certain people experienced the world they live in. The narrative inquiry

technique is unique since it is a relational examination conducted by me (Clandinin, 2013).

This study uses narrative inquiry to explore the life histories, experiences, identities, and subjectivities[6] of black women early career academics in the STEM field within UK higher education institutions. Narrative inquiry allows me to explore the social, political, and historical context in which these informants lived (Clandinin, 2013). The informants' stories are quite distinct and unique. Based on personal ontological and epistemological underpinnings of this study rooted in Interpretivism, a stance is taken as narrative inquirer, rather than an objective observer because the stories of these informants are being uncovered, rather than producing results that are easily generalisable (Connelly and Clandinin, 1990; Clandinin, 2013).

Personal experiences, perspectives, and identities and how they relate to the informants are considered. An in depth understanding of informants' experiences and the social, political, and historical context in which they occur is developed. Also, it is important to understand the impact of 'academic colonisation' in which the researcher has more power in representing informants' stories. By using a narrative inquiry, the issues of 'power' and 'representation are addressed' by positioning oneself alongside the informants and acknowledging personal biases and assumptions. This allows for a more equitable exchange of knowledge and perspectives, where the informants' voices are given equal weight (Becker, 1967).

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[6]This pertains to this study, as it highlights intersectionality, but addresses the individualised and nuanced experiences of black women in higher education particularly STEM fields.

A reflexive stance is adopted here; this involves critically reflecting on my assumptions, biases, and values and how they may influence the research. Through this process, potential sources of bias are identified, and steps are taken to mitigate them. In addition, based on the close relationship and rapport between the informants and me, this allowed me to unpack some emerging themes that arose in the data as well as to present an accurate representation of informants' stories in a manner that fulfilled the researcher social accountability to the informants (Clandinin, 2013). A reflexive process allows for the examination of personal role in representing informants' stories and conversely, their impact in the study. This allows me to be accountable and conduct this study in an ethical and responsible manner which is beneficial in highlight the informants' voices in this study. This approach benefits both the informants and me, fosters a deeper understanding and empathy between us, ultimately leading to a more meaningful and impactful study (Shapiro and Stefkovich, 2016). Furthermore, this approach allows for empathy, concern, and a connection with the informants (Shapiro and Stefkovich, 2016).

The life history approach is most suitable for this study because it allows for the exploration of distinct life histories of six black women early career academics in STEM fields within UK higher education institutions. Furthermore, the life history approach enables the exploration of contextual factors including family background, socio-economic status, and cultural factors in shaping individual experiences and identities. Life history approach is most suitable to address the intersectional issues shaping black women's experiences.

Moreover, the life history approach emphasises the importance of rapport and trust between the researcher and the informant. This is crucial for a study focusing on marginalised groups such as black women in STEM fields, as it allows participants to feel comfortable sharing their stories and experiences. The life history approach also allows for the collection of in-depth data, as it involves gathering information about the informant's entire life, rather than just a single event or experience. In addition, the life history approach is well-suited for this study because it aligns with the Black feminist thought, which is part of the study's theoretical framework. Black feminist thought emphasises the experiences and perspectives of Black women, particularly in relation to issues of power, oppression, and social justice. The life history approach, with its emphasis on the unique life experiences of individuals, provides a means of exploring the intersectionality of race, gender, and location in shaping the experiences of black women early career academics in STEM fields, and is therefore the most suitable of all the narrative inquiry approaches for this study.

4.1.2 Paradigms and philosophical underpinnings

This qualitative study is informed by the interpretivist paradigm, specifically drawing on the epistemological and ontological foundations of social constructionism. Unlike positivism's singular objective reality (Bryman, 2016; p.30), constructionism recognises the existence of multiple subjective realities. Individuals actively construct their understandings of the world through social interactions and their unique experiences. This aligns perfectly with this study's focus on understanding the interpretations and lived experiences of Black British/African women in STEM. It

acknowledges the role of race, gender, class, and social context in shaping these women's realities.

It is important to differentiate between constructionism and constructivism, although both fall under the interpretivist umbrella and emphasise the subjective and socially constructed nature of knowledge. Constructionism is socially mediated and focuses on social construction of knowledge. It emphasised how knowledge is created and shared with in communities and how individual identities are dynamic rather than fixed. In addition, social constructionist believes that, identity, attitudes and values are shaped by culture of context (McNamee et al, 2020). On the other hand, constructivism is interested in the individual, internalised and psychological construction. It is focused on the role individuals play in creating their own reality and meanings (Brau, 2020).

In the context of this study, Constructionism goes beyond simply acknowledging multiple realities; it actively examines the social processes that shape them. This focus on the "how" of meaning-making is crucial for understanding the experiences of Black women in the STEM field. The informants' narrative accounts within the unwelcoming work environment are informed by social interactions, institutional cultures and historical power structures.

Constructionism is relevant to the study aims because this concept allows me to unpack how informants navigate and conceptualise their experiences in the STEM field. Constructionism is most relevant to the evidence gathered from the informants because it provides a link between informant's life stories and locates it within broader social, political and historical contexts which these experiences occurred. By acknowledging the role of social processes and power structures in shaping

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knowledge, constructionism encourages a more ethical research approach. This is particularly important for research focused on marginalised groups like Black women in STEM. By centring the informant's 'voices' and 'life stories', the dominant narratives can be challenged, and contribute towards a more equitable research landscape (Kundnani, 2021).

As noted in previous chapters, Critical Race Theory (CRT), Decolonial Theory with its concept of coloniality of gender, Racial Neoliberalism, and Bourdieu's Theory of Capitals. These theories are chosen for their focus on social power dynamics and inequality; they work synergistically with constructionism to offer varying understanding of the women's experiences. Studies (Solórzano & Parker, 1997; Alexander, 2002; Hall, 2000; Maylor, 2009; Andrews, 2016) have shown that racism is a systemic and pervasive issue within higher education. CRT (Delgado & Stefancic, 2017) directly addresses this by exposing the underlying racialised structures and ideologies that disadvantage people of colour. CRT's concept of counter-storytelling (Solórzano et al, 2003) provides a valuable tool for analysing the women's narratives. By centring their experiences, the dominant narratives of race in STEM can be challenged and the ways in which racism operates within these institutions can be challenged. For example, analysing narratives of micro-aggressions or exclusionary practices can be viewed through a CRT lens.

Decolonial Theory and the Coloniality of Gender is based on the notion that Black women in STEM academia navigate a complex intersection of race, gender, and location. Decolonial theory (Maldonado-Torres, 2007) critiques the ongoing effects of colonialism on knowledge production and social structures. The concept of coloniality

of gender (Lugones, 2008) specifically highlights how Westernised gender norms have been imposed on colonised populations. In view of this, the theory helps me to understand how Black women might negotiate imposed expectations around femininity and professionalism within STEM. For instance, analysing narratives of navigating "masculine" academic spaces or feeling pressure to conform to Eurocentric beauty standards; draws from a coloniality of gender perspective.

Just like the Decolonial Theory and the Coloniality of Gender, the Racial Neoliberalism (Bonilla-Silva, 2006) examines how racism persists within seemingly neutral market-driven ideologies. STEM fields, despite their emphasis on meritocracy, may still harbour racialised biases. Applying this theoretical framework will help us understand how seemingly neutral policies or practices might disproportionately disadvantage Black women. For example, analysing narratives of difficulty securing funding or mentorship opportunities can be viewed through a racial neoliberalism lens, exploring how seemingly neutral systems might perpetuate racial inequalities.

Social class significantly impacts access to opportunities in higher education. Bourdieu's theory of capitals (1986) highlights various forms of capital (cultural, social, economic) that influence success. Drawing on Bourdieu's work, the study can explore how Black women navigate social class barriers within STEM academia. This may include analysing narratives of limited access to research opportunities or feeling unprepared for academic culture can benefit from a Bourdieusian perspective, highlighting how social class shapes their experiences.

In summary, this study draws on 'social constructionism' that explores how the informant's subjective truth and realities are constructed based on culture and context.

For this study, constructionism is the most suitable paradigm alongside the theoretical lenses of CRT, Bourdieu capital theory, decolonial thought, coloniality of gender and racial neoliberalism that suggests how race, gender and neo-liberal discourses shaped the informant's identities, subjectivities and experiences following their participation in the STEM field within the UK higher education institutions. In addition, these higher education landscape consists often of racialised and gendered structures and systems that pose challenges for black women within the academy.

4.2.2 Life history influenced approach

This study uses the life history influenced approach to examine the lived experiences of black women early career academics in STEM fields and unpack how the wider social, cultural, economic, and historical factors shape the career trajectories of the informants in this study. The life history influenced approach gives 'voice' to the informants and allows the researcher to explore the personal nature of relationships (Goodson and Sikes, 2001).

The life history method, according to Gill and Goodson (2011), in the context of my study offers several strengths:

- **Depth and Detail:** It facilitates in-depth exploration of the women's personal backgrounds and how these backgrounds influence their career journeys. This depth allows for a richer understanding of their experiences than might be captured through other methods.

- **Voice and Agency:** The method centres the women's voices, allowing them to share their experiences and perspectives in their own words. This empowers them and ensures their agency is recognised within the research.

- **Historical Context:** Life history interviews often involve a retrospective quality, enabling the exploration of social processes over time. This historical depth enriches the analysis by contextualising the women's experiences within broader societal shifts.

The data collection process typically involves a three-stage approach (Gill and Goodson, 2011):

i. **Narration:** An initial life story interview where the participant shares their overall life narrative.

ii. **Collaboration:** Subsequent interviews focusing on specific aspects or turning points in their careers.

iii. **Location:** Integration of the individual life story within the broader social, political, and historical context.

By employing the life history approach, a retrospective lens on the participants' experiences would be gained. This allows us to explore the influence of social processes over time and situate their narratives within a deeper historical context for a more nuanced analysis.

Life history methods have origins in the Chicago School of sociology in the 1930s and has since been adopted by both anthropologists and sociologists (Gill and Goodson, 2011). In common with other narrative methods including oral histories, Life history method explores the lived experiences of individuals and groups in the past and present which is analysed by researchers who then place these narrative accounts within the social, political, economic and historical contexts where these experiences

took place (Gill and Goodson, 2011). The purpose of life history method is to understand the interplay between social change, individual or group lives and agency (Goodson and Sikes, 2001; p.41). Both life history and CRT help to uncover the oppressive mechanisms of society utilising counter storytelling. This counter life history approach helps to highlight the voices of ethnic minorities and their experiential knowledge from education into the dominant society thus challenging hegemonic narratives including that of objectivity, neutrality and meritocracy of the dominant race in society (Bagley and Castro-Salazar, 2019;p.244).

4.2.3 Problematising life history influenced approach and narrative methods

Life history influenced approach in common with other oral traditions including narrative analysis, life story and autobiographical inquiries solely rely on narrative accounts by informants as a major source of data for empirical studies (Goodson and Sikes, 2001). However, Goodley (1996) argues that life history influenced approach and other narrative approaches have been criticised for being unscientific and theoretically deficient'. The main reason for this critique is focused on the issue of 'interpretation'. Goodson and Sikes (2001) argue that the meaning and intention of a 'life story' are open to interpretation by the informant, the researcher and the reader of texts that result from an empirical study.

Considering that, life history method uses a retrospective approach on individual and group lived experiences together with the researcher's analysis of these narrative accounts within the social, political, and historical contexts in which these events took place (Goodson and Sikes, 2001) which is relevant to my study aims. Dyson (2003; p.98) argues "that life history method cannot be devoid of biases and assumptions

considering the interactions between the researcher and the informant which plays a key role in shaping the meaning and interpretation for the reader". Thus, autobiographical accounts would be used to declare all biases, interests, and values. Dyson (2003) further argues that life history methods have been criticised based on claims about epistemology. These criticisms include that the informants may not give an accurate representation of themselves in their narrative accounts rather, they may create a false sense of who they are and what they can do and distort what they wish and only say what they recall. Thus, life history method has been criticised for being an 'inadequate' method of inquiry because the stories told by the informants could be based on deception (Dyson, 2003).

On the other hand, Goodson and Sikes (2001) argue that the issue of one generalisable truth has been brought up in the critiques of life histories. However, the concept of 'truth' and 'reality' to life histories is an impossible task. Lanford *et al*. (2018) argue that this critique comes from positivist researchers who deal with quantitative methods or 'big data sets' and who only identify quantitative limitations particularly with regards to human institutions, cultural contexts, and social inequalities. Life history methods are useful to highlight the voices of marginalised and therefore are well suited here.

4.2.4   How /Why is life history influenced approach is important to this study

Drawing on Goodson and Sikes (2001) approach to life history methods focused on personal narrative accounts from informants. Life historians argue that all stories and biographies can be told from unique perspectives (Gardner, 2020). This refers to

narrative identity which covers the style and form of stories that are told based on several factors including context, audience, time, value, and motivation.

Based on the ontological and epistemological underpinnings of this study, that suggests that there are multiple and subjective interpretations of 'truth' and 'reality' and these concepts are based on context, I would argue that I am looking at the unique lived experiences of black women early career academics in the STEM field within UK higher education to ascertain their success stories and challenges they face in pursuing career advancement within the academy. Considering that life history is focused on interpretation, intention, and narrative account of informants, life history is most suitable in this study to ascertain the unique lived experiences of these informants with regards to issues of race and gender disparity in the STEM field within UK higher education institutions.

This is qualitative study that does not claim to have a 'representative' or 'generalisable' truth on the experiences of black women in STEM fields; rather I take an illustrative approach to elaborate on the unique experiences and subjectivities of black women early career academics. Life history influenced approach is most suitable for this study as it often highlights the voices of 'overlooked groups' in quantitative datasets. Life history method focuses on democratising the academy by providing a voice and scholarly representation of marginalised groups including women and ethnic minorities that are largely under-represented within the academy (Gill and Goodson, 2011).

4.2.5 Combining life history and Critical Race Theory (CRT)

The study is influenced by life history influenced approach and Critical Race Theory (CRT) to provide new perspectives and counter oppressive mechanisms related to

racial equity and structural racism. CRT offers alternative epistemologies and counter-storytelling to challenge dominant research paradigms and generate knowledge production that counteracts systematic oppression. Life history method, on the other hand, allows for an analytical examination of power relations between hegemonic and counter stories related to racial discourse. By combining these two methods, the study uses counter-storytelling to amplify the voices of minority ethnic academics, particularly black women, within UK higher education institutions and challenge the oppressive mechanisms that uphold whiteness and emphasise the hegemonic narratives of objectivity, neutrality, and meritocracy within the sector. Solórzano and Yosso (2001) argue that white privilege is expressed through these hegemonic narratives, which are often presented as 'truth' by the dominant race when discussing racial equity. The study highlights that diversity discourses in universities are often superficially addressed without meaningful implementation, which limits their impact.

4.3 Research Strategy

This is a qualitative study that employs life history influenced approach interviews as a primary source of data to examine the experiences of black women early career academics in the STEM field within UK higher education institutions. CRT provides an analytical framework that examines the role of systemic racism and structural inequalities that shapes the informant's life stories and experiences. The life history method, centred on in-depth, semi-structured interviews, facilitates the exploration of the women's narratives, capturing their experiences across various stages of their academic journeys. By centring their voices and counter-stories (Solórzano et al, 2003), CRT allows us to challenge dominant narratives of race and gender in STEM

academia and expose the ways systemic racism operates within these institutions. Decolonial theory highlights the longstanding effects of colonialism on people of colour (Lugones, 2008). While coloniality of gender which emerged from decolonial theory, examines how western gender norms has disrupted gender roles and norms in other non-western cultures that were previously colonised. These theoretical lenses relates to this study, as it unpacks the ways in which coloniality and western patriarchy shapes the experiences of black women early career academics in the STEM field within UK higher education institutions. Simultaneously, racial neoliberalism (Bonilla-Silva, 2006; Kundnani, 2021) reveals how institutional policies and practices in the SETM field could be potentially positioning black women as disadvantaged. In addition, Bourdieu capital theory (1986) provides an analytical framework in which the schooling system reproduces social class disparities and its values are similar to that of the elite class. Furthermore, this disadvantage working class students and this is a form of 'symbolic violence' meaning the power relations that further oppresses the working class.

4.4 Study population

Study population is usually understood as the aggregate or totality of all objects or members that conform to a set of specifications (Bryman, 2016). Study population comprises the targeted population of the study which is the entire aggregation of respondents that meet the designated set of criteria (Bryman, 2016). The study population consists of the people of interest to the researcher. For this study, the study population includes six black women early career academics that comprises of three PhD candidates, two Postdoctoral researchers and one lecturer. Disaggregation of mobility data by gender and race is not available in the UK. However, the UK Higher

Education Student Statistics (2021) indicated that all higher education students in 2020/21, 57% were female, and black African and black Americans constitute about 11%.

4.5   Sampling strategy

This study employs a multi-stage sampling approach. The first stage involved the purposive selection of Black women working in STEM fields within UK higher education institutions. For the purposes of this study, "Black women" are defined as those who self-identify as Black and are of African or Caribbean descent living in the United Kingdom. This choice was deliberate, as it reflects the study's aim to investigate the experiences of a group that is significantly underrepresented in UK STEM fields.

However, recruiting participants proved challenging due to the COVID-19 pandemic and initial concerns about anonymity among potential participants. To address this, the sampling strategy shifted to include doctoral candidates, who were more readily accessible and willing to participate. This change in strategy also broadened the scope of the study to encompass Black women with at least one parent of African descent, specifically from Nigeria and Ghana. This decision was based on convenience sampling, as these individuals were more readily available for recruitment. While this shift expanded the range of experiences captured in the study, it also introduced a limitation in terms of representing the full diversity of the Black British community.

Finally, a snowball sampling strategy was employed to recruit a total of six Black women. This method allowed for the in-depth exploration of the participants' experiences, subjectivities, and identities through semi-structured life history

interviews. Snowball sampling was particularly useful in this context, as it helped to overcome the initial challenges in recruitment and access to potential participants.

The initial focus on postdoctoral researchers proved difficult due to concerns about professional exposure. Two participants withdrew from the study, highlighting the ethical considerations involved in researching sensitive topics with marginalized groups. However, the expansion to include doctoral candidates allowed for successful recruitment, resulting in a diverse sample of three doctoral candidates, two postdoctoral researchers, and one lecturer.

While most informants were originally from Nigeria, one was from Ghana. The focus on the West African diaspora was not the initial intention but a result of the self-selection process. Future research could expand upon this by including a more diverse range of Black individuals, encompassing those from Black British/Caribbean backgrounds, to provide a more comprehensive understanding of the experiences of Black women in UK STEM.

The use of in-depth semi-structured life history interviews presented both opportunities and challenges. The personal nature of the questions, requiring participants to recollect potentially unpleasant experiences, initially posed a barrier to recruitment. However, through rapport-building and establishing trust, six participants were retained. The sensitive nature of the topic underscored the importance of ethical considerations, including ensuring participants' informed consent, confidentiality, and anonymity.

In conclusion, while the multi-stage sampling strategy successfully recruited a diverse group of Black women in STEM, it is important to acknowledge the limitations of convenience and snowball sampling methods. While convenience and snowball sampling facilitated initial participant recruitment and access to a diverse range of Black women in STEM, these methods have inherent limitations. Convenience sampling, relying on readily available participants, risks limited representativeness and potential bias in participant selection. Similarly, snowball sampling, dependent on referrals from existing participants, may result in a less diverse sample and potential bias toward specific social networks or viewpoints. These limitations necessitate caution in generalizing the findings to the broader population of Black women in UK STEM fields. Future research could address these shortcomings by employing more rigorous sampling methods, such as stratified random sampling, to ensure a more representative sample, while remaining attentive to ethical considerations regarding participant vulnerability and potential risks.

4.4.1 Inclusion and exclusion criteria

The primary data collection for this study specifically focused on Black women early career academics working in STEM fields within UK higher education institutions. To ensure alignment with the research aims, participants were selected based on the following criteria:

1. Self-identification as a Black woman: This criterion acknowledges the self-determined nature of racial identity and allows participants to define their own racial background.

2. Early career status in STEM field: This encompasses doctoral candidates, postdoctoral researchers, and lecturers in the early stages of their academic careers, aligning with the study's focus on the unique challenges and experiences faced by this group.

3. Having completed their doctorate within the last 10 years: This criterion was initially intended to capture recent graduates who were likely to have entered the workforce during a time of significant neoliberal reforms in higher education. However, this criterion was later revised to accommodate the inclusion of doctoral candidates who are still working towards their degrees but are actively engaged in research and teaching within STEM fields.

The age range of 25-50 was initially included as a proxy for early-career status but was later deemed unnecessary and potentially exclusionary, as it could exclude individuals who may have entered academia later in life. The revised criteria focus on career stage rather than age, allowing for a more inclusive and accurate representation of the target population.

Exclusion criteria included:

1. Men: This study focuses specifically on the experiences of Black women, as their intersectional identities are central to the research questions.

2. Academics in the humanities department: This study is specifically focused on the STEM fields, as the underrepresentation of Black women in these fields is a key concern.

3. Senior academics: This criterion was initially included to focus on the unique challenges faced by early career researchers. However, it was later revised to

include a broader range of experiences, as some senior academics may have entered academia later in life and still identify as early career researchers.

The exclusion of individuals from other ethnic groups is not explicitly stated, as the focus of this study is specifically on the experiences of Black women. However, it is implicitly understood that the research aims to center the voices and perspectives of this particular group.

It is important to acknowledge that the sampling strategy and inclusion/exclusion criteria may limit the generalizability of the findings to other groups. However, the focus on a specific demographic allows for a more in-depth exploration of the experiences of Black women early career academics in STEM, contributing to a growing body of knowledge in this under-researched area.

4.4.2 An Overview of the Study Participants

In-depth interviews with six participants, using pseudonyms for anonymity, shed light on their unique career journeys and the challenges they face within academia. The research is centred on race and gender, well-documented factors influencing educational and professional pathways, particularly for those navigating marginalised identities in historically homogenous fields (Solórzano and Parker; 1997).

To ensure diverse perspectives and maintain Chinyere onfidentiality, a combination of social media platforms, online STEM forums, and snowball sampling were utilised to recruit the participants. Although a broader representation was initially desired, access-related obstacles limited the final sample to six participants (Macleod and Mnyaka, 2018). Despite the smaller sample size, the group offered valuable insights

due to their diverse backgrounds and career stages. Participants included PhD students, postdoctoral researchers, and lecturers with varying levels of experience within their fields (ranging from one to nine years).

While a core strength of life history research lies in rich, detailed descriptions, ethical considerations of participant anonymity necessitate a balance. This study acknowledges the tension between providing thick descriptions and protecting participant identities, particularly given the potential for hyper visibility within a relatively small sample (Macleod and Mnyaka, 2018). The following broad overview provides a glimpse into the diverse backgrounds of the research participants:

I. **Socioeconomic Background:** The sample includes participants from both middle-class (4) and working-class (2) backgrounds, highlighting how social class intersects with race and gender in shaping career trajectories.

II. **Academic Attainment:** Three participants have completed their PhDs, two are actively enrolled, and one is in their first year of doctoral studies, providing insights across various academic stages.

III. **Appointment Status:** Participants hold diverse appointments, including doctoral candidate, postdoctoral researcher, lecturer, and early career academic, offering perspectives across different career stages within the higher education system.

IV. **Institutional Experience:** Their experience at their current institutions ranges from one to nine years, showcasing a spectrum of perspectives on navigating institutional cultures and structures.

V. **Table 4.1:   Demographic Background of Study Participants**

Name (pseudonym)	Kehinde	Chinonye	Chinyere	Victoria	Wemimo	Yemi
Age	25-35	25-35	35-45	25-35	25-35	25-35
Racial classification*	Black African	Black British/African	Black African	Black African	Black African	Black African
Class and cultural background	Middle class/Nigerian	Middle-class/ British Nigerian	Middle-class/British Nigerian	working-class British Ghanaian	Middle-class British Nigerian	Middle-class British Nigerian
PhD obtained. (year)	2022	2019	2011	ongoing	Ongoing	2020
STEM Specialty	Medicine	Biosciences	Microbiology	Clinical psychology	Neuroscience	Clinical psychology
Appointment status	Final year PhD student	Early career academics	Lecturer	Final year PhD student	First year PhD student	Early career academic
Year of appointment at this university	2017	2019	2012	2018	2021	2020

Level of appointment	Doctoral candidate	Post doctorate candidate	Lecturer	Doctoral candidate	Doctoral candidate	post doctorate candidate
Previous Work	Student	Student	Stude nt	Student	Student	Student

Source Field Survey, 2022

4.5 Data Collection

The study utilised a Key Informant Interview (KII) method to gather qualitative data, which included only those participants who met the minimum eligibility criteria. To capture the narratives and perspectives of Black women in this study, a life history approach influenced by Goodson and Sikes (2001) was adopted. It should be noted that the life history approach typically requires multiple interviews to gain a comprehensive understanding of the participant's experiences. However, due to various constraints such as time and funding limitations, it was not possible to conduct multiple interviews with all participants. Therefore, a second interview was only conducted with a select few participants who demonstrated particularly rich and insightful narratives. This strategy allowed for a deeper exploration of the experiences of these individuals and ensured that the data collected were of high quality. The decision to conduct a second interview with only a few participants was necessary to maximise the limited resources available and ensure the study's overall feasibility.

A semi-structured interview guide was designed. After gaining authorisation from the ethics committee, the field work took place from November 2021 to August 2022. The

initial and follow-up interviews were conducted with the informants one by one and recorded via zoom meeting. The benefits of using zoom facilitated easy communication with the participants, as well as enabling me to record the interviews. This afforded me the time to concentrate on engaging with the participant instead of taking notes. Nonetheless, there are also drawbacks associated with the zoom meetings. One such limitation is poor internet connectivity, interrupting the flow of the interview and makes it difficult to comprehend or record the participant's responses as well as the missed intimacy and trust-building that in-person interviews provide.

The interview guide (see Appendix A) includes themes such as (a) background and early education, (b) higher education, (c) employment and progression and (d) barriers and opportunities. The inclusion of the themes in the interview guide is based on their relevance to understanding the experiences and perspectives of the research participants. The background and early education theme provide insight into the participants' upbringing and how it may have influenced their decision to pursue STEM fields. The higher education theme allows for an understanding of the participants' experiences in pursuing their STEM education and how it may have shaped their career paths. The employment and progression theme sheds light on the participants' experiences in the workplace, including any challenges they may have faced and how they have progressed in their careers. Finally, the barriers and opportunities provided the informants with an opportunity to share their life story often shaped by systemic and personal barriers. However, these barriers offer new opportunities. The six informants across the STEM disciplines from different universities were recruited to participate in the interview session, which lasted for 60 minutes per informant on the

average. The study documented opinions of the informants on the above-mentioned questions. The names and locations of interviewees were anonymised so that their responses cannot be traced back to them, to protect the identity of the informants. The interviews were recorded via zoom meeting video and fully transcribed and the audio deleted afterwards.

4.6 Data analysis

The data obtained from the Key Informant Interviews (KIIs) were analysed using a life history approach, which focuses on the narratives and perspectives of Black women in STEM. The initial interviews were conducted using a semi-structured interview guide, and the data were transcribed verbatim. The data analysis is presented under three chapters, each addressing different aspects of the participants' experiences.

The first empirical chapter, titled "Constructing an Identity through Critical Incidents," focuses on how the informants constructed their identity and how they navigated through critical incidents that impacted their academic and professional journeys. The second chapter, titled "Representation and Experiences of Black Women Working in UK STEM," explores the informants' experiences of being a minority in their workplaces, including the challenges they faced and the support they received. The third and final chapter of the analysis, titled "Inclusion and Exclusion," delves into the experiences of exclusion and the barriers faced by the informants in accessing higher education and progressing in their careers.

The life history influenced approach used in this study enabled me to move from a focus on individual life stories to a broader understanding of the experiences of Black women in STEM. The themes identified in the initial interviews were then used to

inform the subsequent interviews, allowing for a deeper exploration of the participants' experiences. In relocating the life story to the broader context of the life history approach, the power dynamics at play in the STEM sector became evident. By contextualising the participants' experiences within the broader societal and institutional frameworks, it became apparent that their experiences were not solely the result of individual circumstances, but rather, the product of larger systemic issues. The reframing and contextualising of the life stories of Black women in STEM involved a power play in which the participants' narratives were situated within broader social, economic, and political contexts. This reframing served to highlight the power dynamics at play in the STEM sector and to challenge dominant narratives that position Black women as outsiders in this field.

4.7 Ethical considerations

This research adheres to the British Educational Research Association (BERA, 2018) ethical guidelines and received approval from St Mary's University research ethics committee in autumn 2021. As a qualitative study employing the life history method, this research navigates ethical considerations inherent in this approach, including researcher transparency, sensitive subject matter, and power dynamics between researcher and participants (Goodson and Sikes, 2001).

Recognizing that complete objectivity is unattainable in qualitative research, I acknowledge my positionality as a Black woman researcher and how this may influence the research process. As Denzin and Lincoln (2003) suggest, qualitative inquiry is a collaborative endeavour involving ongoing dialogue between researcher and participants. My own experiences as a Black woman in academia have

undoubtedly shaped my research interests and the questions I ask. However, I strive to maintain reflexivity throughout the research process, acknowledging my biases and assumptions, and actively seeking to understand and represent the participants' perspectives in their own words.

Confidentiality and anonymity were prioritized throughout this study. All participants were provided with an informed consent form that emphasized their autonomy and right to withdraw at any time. Only individuals over 18 years of age were recruited to ensure their capacity to provide informed consent. Pseudonyms were used in data analysis and reporting to protect participants' identities and those of their institutions.

The sensitive nature of the research topic, which involved participants sharing personal experiences of racism and sexism, posed unique challenges to maintaining confidentiality and ensuring participant well-being. To address these concerns, I established rapport and trust with participants, creating a safe space for them to share their stories. I also emphasized the voluntary nature of participation and assured them that they could choose not to answer any questions they found uncomfortable.

In addition to protecting participant identities, confidentiality extended to the institutions where participants were employed. Specific details that could potentially identify the institutions were omitted or generalized to ensure anonymity.

While every effort was made to uphold ethical standards, the nature of life history research, with its focus on personal narratives and potentially sensitive topics, inherently carries risks. Participants may experience emotional distress when recalling past experiences of discrimination and marginalization. To mitigate this risk, I provided

resources for support services and ensured that participants felt comfortable discussing any concerns they had.

By prioritizing ethical considerations and maintaining transparency throughout the research process, this study aims to conduct research in a manner that is respectful of participants' autonomy, privacy, and well-being, while also generating valuable insights into the experiences of Black women in STEM.

4.10 Researcher identity, positionality, and truth claims

My identity as a researcher shaped this project. According to Hardy *et al.* (2001), reflexivity is a crucial aspect of qualitative research, requiring researchers to understand fully how research processes shape outcomes and reflect on their inquiry methods to explain how they reach certain outcomes. Researchers' perceptions of reflexivity are influenced by their ontological and epistemological positions. For instance, researchers with a modernist view of the "self" as singular or knowable will approach reflexivity differently from those with postmodernist perspectives of the "self" as multiple and unknowable. Although researchers with a modernist approach might argue that self-reflexive practices enable them to "truly" know themselves and provide a "true" account of how their biases influenced the research process, postmodernist researchers recognise the challenges of engaging in self-reflexive practices and qualify self-knowledge as partial and any research process account as limited.

Reflexivity challenges the belief that modernist researchers can report objectively on their observations of the social world as well as the experiences of others, as emphasised by the crisis of representation. Reflexive approaches suggest that observations are socially constructed, and participants' experiences are partial.

Therefore, the post-structuralist feminist perspective adopted in this study acknowledges that gender identity is fluid and fragmented, with more open boundaries than modernist approaches that emphasise a fixed and essentialised identity. All subjectivities and biases were disclosed in this study through personal biographies of the researcher's experience as a scholar. This study seeks to explore deeper insights into the multi-layered accounts of black women in STEM fields within UK higher education institutions rather than searching for "truth." The language used in the study is not the only focus; the ways in which informants articulate their experiences were also analysed (see Chapter six).

4.11 Conclusion

In conclusion, this chapter provides a detailed discussion of my chosen research method, including its philosophical assumptions, epistemological considerations, ethical dimensions, and the overall rationale for the chosen research methodology. The chapter also contained the research design, which includes the paradigms and philosophical underpinnings, critical theory paradigm, and black feminist thought. Furthermore, the chapter provided justification for combining history influenced approach and CRT.The study population, sampling strategy, data collection, data analysis and ethical considerations were also presented. Finally, the chapter discussed researcher identity, positionality, and truth claims.

The study aims explores how the informant's life stories are implicated by race, gender and neoliberal discourses while they participate in a racialised and gendered STEM field within UK higher education institutions. The critical theory paradigm and black feminist thought provide a theoretical framework to understand and address power

relations and social inequality. Critical race theory and life history method examines how race and gender shape experiences in the STEM field. The combination of life history and CRT enables a deeper exploration of the complexities of these experiences. The research strategy involved in-depth interviews with the research participants. Overall, this chapter has presented a comprehensive overview of the chosen research method, highlighting the importance of theoretical frameworks and ethical considerations in conducting research. The following chapters focus on the findings of the study and their implications.

<u>**Chapter Five**</u>

<u>**Constructing an identity through critical incidents**</u>

<u>**5.0 Introduction**</u>

This chapter examines the experiences of black women early career academics in the STEM field within UK higher education. This chapter explores the emerging themes from the data collected including narrative accounts concerning critical incidents during informant's childhood such as family upbringing, early education, family attitudes towards education and social and cultural backgrounds. This chapter is structured into six subsections: "Home cultures and the importance of education," "Access to learning resources," "Educational experiences and influences," "Constructing a gender and racial identity," "Constructing a STEM identity," and "Selecting STEM Career."

This chapter uncovers the early life and upbringing of the informants and the messages received as children concerning selecting profitable career path. This chapter 'locates' the informant's experiences to broader social, political and historical concepts including colonialism, coloniality, capitalism and racial neoliberalism to uncover the interconnectedness between individual life story to the broader social structures to create a life history. This approach provides an analysis of how broader social structures shaped individual experiences and vice versa. Furthermore, this uncovers the mutual relationship between the structure and agency debate within the sociological field (Goodson and Sikes, 2001). In addition, I examine how the early life, upbringing and family attitudes of the informants shapes their identity construction and their selection of STEM subjects as a career path.

5.1 Home cultures and the importance of education

This theme explores the key role of informant's cultural background in shaping their attitudes and values towards education. Socio-cultural attitudes and values within the family setting can shape an individual's motivations and aspirations in pursuing an academic career within the UK higher education institutions. The informants discussed how their families and cultural backgrounds shaped their education trajectory and identity construction. Each informant narrative account highlights the importance of education in their respective families.

For instance, Kehinde described a home environment that prioritised academic pursuits:

> *"I grew up in an extended family setting – so with aunties and uncles, everyone in the same space. But virtually, it was either you were reading or going to school."* –Kehinde

Kehinde emphasised the value of education particularly pursuing further education in her family, stating that academic pursuits were prioritised even in an extended family setting. This aligns with the broader cultural context of African immigrant communities in the UK, where education is often seen as a means of success and upward social mobility (Showummi, 2023). While Kehinde acknowledged some limitations imposed by traditional norms, she felt supported and empowered as a woman, pursuing education.

> *"It was mainly about just trying to get along with life because... there is little I can really grasp about my childhood, but it was fun."* - Kehinde

Kehinde's recollection of her childhood suggests that although education was a significant part of her upbringing, there were also elements of joy and enjoyment. This indicates a balanced approach to life, where education was integrated without overshadowing other aspects of childhood experiences.

"Well, I had aunties and uncles, so I think gender didn't really matter for us. So, it was fun growing up, knowing that you had a lot of aunties to look up to."

-Kehinde

This quote highlights that, gender stereotypes were not significant in her extended family setting and she felt supported regardless of gender. This aspect of her upbringing enabled her to persist regardless of the 'glass ceiling' meaning structural inequalities and institutional barriers that limit black women academics within higher education (Showummi,2023). On the other hand, Kehinde acknowledged that certain cultural practices emphasized on limiting gender roles yet she still felt empowered regardless of these traditions.

"There wasn't really any other thing, apart from the usual traditional things – Especially with regards to what a woman is allowed to do and not do"-

Kehinde

Based on Kehinde's narrative, education was highly valued within their home environment. Kehinde's family created an environment where learning and academic achievement were prioritised. Additionally, the presence of supportive family members further reinforced the significance of education. Kehinde's narrative account also highlights the importance of feeling supported within their community. Despite

Kehinde's awareness of the existing limitations, she felt empowered in her academic pursuit.

Chinonye's upbringing emphasised the value of education. Chinonye's parents emphasis on the value of education can be traced back to the neoliberal ideals within capitalist society which is the aftermath of colonialism. These neoliberal ideals have become widespread across time and place through globalisation. These neo-liberal ideals including rational choice, individual success and competition seemed underpins the values within contemporary society.

"My upbringing emphasised discipline, hard work, and the importance of education." -Chinonye

Chinonye's background played a key role in shaping her aspirations for pursuing a STEM career. Chinonye's parents instilled meritocratic values for achieving success including hard work, consistency and effective time management. Chinonye's parents strongly emphasised the importance of education for upward social mobility. This highlights what counts as academic success and 'making it' is discursively produces. For Chinonye's family upbringing in West Africa, the conceptualisations of success are based on academic achievements shaped by legacies of colonialism which can be traced back to the colonial legacy of the British empire including global inequality, capitalism, neo-liberalism and racism (Mayblin and Turner, 2020). The colonial legacy of the British empire left many traces of racism in contemporary Britain which shaped individual's perceptions of different ethnic groups (Davidson and Shire, 2015). The concept of 'colonialism' is relevant in this analysis because it 'naturalizes' constructions of knowledge, gendered aspirations, conceptions of excellence, social

and academic hierarchies and conceptualisations of success reproduced within modern globalised institutions, disciplines and practices (Maldonado-Torres, 2007).

During the 19th and 20th century, colonialism was viewed as natural for white men to rule over black individuals and it was the white man's responsibility to civilise all ethnic groups (Davidson and Shire, 2015). This legacy is partially reproduced and reinforced the concept of racial neo-liberalism and coloniality in the 21st century with the continued reproductions of racial hierarchy in relation to globalised distribution of wealth, opportunities and resources in the world. It raises the question of who own and distributes the wealth, resources and opportunities in this world (Davidson and Shire, 2015). This suggests that, certain neo-liberal values continue to shape how educational success is conceptualised and the very construction of what counts as worthwhile knowledge. Returning to Chinonye's narrative account, these threads are clear in her parent's emphasis on education that aligns with broader cultural values in her family background, where education is linked to gender empowerment. For instance, families are often encouraged in Nigeria to give a good education to the girl child to increase their life chances and for upward social mobility.

Chinonye's parents instilled a strong work ethic and time management skills, highlighting the importance of education for success which can be traced back to neo-liberal and capitalist ideals reproduced during the colonial era. They described their family environment as one that fostered a balanced approach to learning:

> *"My parents encouraged me to set aside time for studying even during breaks from school." -Chinonye*

This quote highlights, Chinonye's parent's emphasis on the importance of education highlights the parent's desire for their daughter to be the 'ideal neo-liberal subject' and accrue these required capitals to achieve academic success. However, these informants faced unique challenges including race and gender discrimination that shaped their education and career trajectory. Moreover, these neo-liberal ideals are often negated based on structural barriers and inequalities shaped by colonial legacies, racism and sexism which often shaped the experiences of black women early career academics in the STEM field within the UK higher education institutions.

Chinonye also mentioned receiving additional educational support outside of school hours.

"I participated in supplementary classes to enhance my learning."-Chinonye

This quote suggests that, Chinonye's parents were committed to providing additional educational support to her. In addition, Chinonye's cultural background played a key role in shaping her educational aspirations. Chinonye's parents emphasised the role of academic success which is ingrained in her cultural values within her community. These neoliberal ideals were shaped by coloniality which has become a widespread norm through globalisation (Maldonado-torres, 2007).

"Certain career paths are highly valued within my cultural background."

-Chinonye

While cultural norms influenced career aspirations, Chinonye also mentioned parental support for non-STEM careers that offered stability. Overall, Chinonye 's narrative account highlights the importance of education within her family and the influence of her cultural background on her educational journey. Chinonye's experiences growing up also highlight the broader social and cultural factors including family and community influences that shapes her choice for a STEM career.

Similar to other informants, Chinyere's upbringing in Nigeria played a key role in shaping her identity construction. Chinyere described a strong sense of belonging and cultural unity within their home environment.

"Growing up in my home country, I felt a strong sense of belonging and shared cultural identity." -Chinyere

This quote emphasises the importance of cultural background for Chinyere who migrated to the UK to pursue further education. Chinyere is deeply ingrained in her cultural background and this shapes her identity and experiences in the UK.

"My upbringing shaped my perspective and how I navigate certain situations." -Chinyere

This quote suggests that, Chinyere's cultural background shaped her experiences in her new environment. Chinyere's upbringing in Nigeria played a key role in shaping her identity as she described a strong sense of belonging to her cultural background and heritage. Chinyere mentioned that, her strong sense of belonging increased her

self-esteem and prepared her for the unique challenges faced by black women within the UK higher education institutions.

"My upbringing prepared me for some of the challenges I faced when I moved to a new country." -Chinyere

Chinyere 's experience in the UK highlighted the concept of racial identity for her. Chinyere mentioned that, she was only aware of her blackness when she arrived to the UK.

"Living in the UK made me more aware of my racial background." -Chinyere

This suggests that Chinyere 's racial consciousness developed in the UK context. Chinyere's experiences as a black person in a predominantly white environment highlight the broader structural inequalities and institutional barriers that limits the progression of black individuals within UK higher education institutions.

"Being one of few people of colour in academic spaces can be both isolating and demanding." -Chinyere

This quote highlights the complex experience of being a minority in academia. This relates to Hill-Collins (1999) black feminist thought theory that suggests black women have a unique standpoint to theorise about their experiences because mainstream sociology have historically omitted the experiences of black women within higher education while highlighting the experiences of 'white men'.

Chinyere identified as middle class, acknowledging the privileges associated with that background.

"My upbringing provided me with educational advantages." -Chinyere

This emphasises the interconnectedness between social class and educational opportunities. Ayling (2015) drew on Bourdieu theory of practise to examine how Nigerian elites secure the elite status of their children by enrolling them in British schools and universities to accrue the necessary capitals similar to that of the elite white British children. Overall, Chinyere 's narrative highlights the influence of her cultural background, social class, and the context of her new environment on her experiences as a black early career academic in the UK.

Similar to other informants, the importance of education was instilled in all three informants during their childhood. The informants home environments emphasised the value of learning and provided them with resources to succeed.

Victoria's upbringing highlighted the significance of early exposure to reading and literacy. This provided her with a strong foundation for academic success.

"My early experiences with books helped me excel in school." -Victoria

Victoria 's experiences also highlighted the role of cultural traditions such as storytelling in shaping her intellectual development. All three informants discussed about navigating structural inequalities and institutional barriers in predominantly 'white' and 'male' STEM field. These informants described less feelings of belonging within their institution, invisibility and isolation.

"Growing up in a new environment, I noticed racial differences and a sense of distance from the surrounding community." -Victoria

These informants' experiences listed above highlights the challenges of international students and ethnic minority students integrating within their multi-cultural host society. For example, Victoria identified as Black British or Ghanaian-British, acknowledging the influence of both her race and nationality.

"My background shapes my experiences and opportunities." -Victoria

Wemimo's narrative account emphasise the value of education within her family and cultural background.

"Education was seen as a key to success and a way to improve my life." -Wemimo

Wemimo also described feeling isolated during her childhood in her predominantly white London borough.

"I sometimes felt like I didn't quite belong." -Wemimo

The above experiences highlight the challenges to integration within a multicultural society.

Yemi mentioned that, she felt the pressure from family and community to achieve academic success. This pressure could be traced back to family expectations and the existing shortages of black women within UK higher education institutions including the STEM field.

"There were expectations to perform well academically." -Yemi

Yemi 's background also influenced their decision to pursue a career in academia.

"The lack of role models motivated me to pursue this path." -Yemi

Yemi's experiences highlights the importance of increased representation and mentorship programs for young black girls aspiring to pursue STEM careers. These informants narrative accounts emphasise the influence of cultural background including race, family and community influences on the informant's academic aspirations. These informants faced challenges including less feelings of belonging and little or no role models. These experiences highlight the broader structural inequalities and institutional barriers within the UK higher education institution. Furthermore, the informant's experiences including Chinyere, Victoria, Wemimo and Yemi underlines the key tenets of CRT that emphasizes on the pedestrian nature of racism within western institutions. These informants' experiences underline how the informant's racial identities and race consciousness are constructed within predominantly white institutions. In addition, it suggests that, 'whiteness' and 'white privilege' is sustained within UK higher education institutions through false conceptions of meritocracy, structural inequalities and institutional barriers that positions black individuals as outsiders within spaces reserved for white men (Bhopal, 2020).

Decolonial thought is relevant to the informant's accounts as there is ongoing effects of coloniality on the global education systems. The emphasis on the importance of education within most of informant's families including Chinonye, Chinyere, Victoria, Wemimo and Yemi can be traced back to the colonial legacy of the British empire and the longstanding effects of coloniality, capitalism and neo-liberalism on the global education systems that emphasize the need to produce highly skilled workforce to meet the demands of the labour market (Denmead, 2019). I would argue that, most

informants were neoliberal subjects who strived to achieve the neo-liberal dream of individual success, rational choice and competition within institutions that negated their aspirations, skills and competencies in the STEM field within the UK higher education institutions.

While social class background are not explicitly mentioned, Chinyere, Victoria and Wemimo describe access to educational resources and parental support suggesting that their parents had some levels of economic and cultural capital that benefitted the informants throughout their educational journeys. Drawing on Bourdieu (1985) capitals theory, cultural knowledge and dispositions are passed from one generation to another through families. Bourdieu (1985) argues that, the values reproduced in the schooling system is similar to that of the elite class. Furthermore, this is a form of 'symbolic violence' towards to working class who do not possess the values and habitus of the elite class. For example, the students from middle-class families have access to learning resources and supplementary schooling that is not accessible to the students from working-class families.

Yemi's narrative account relates to these theoretical concepts because she came from a middle-class Nigerian family in the UK who exerted pressure on her to achieve academic success as well as to address structural and institutional issues including the underrepresentation of black women in the STEM field within the UK higher education institutions.

In conclusion, these informants narrative accounts demonstrate the interplay between race, structure and agency. While the informant's families instilled the value of education in them, these informants who aspire to achieve their neo-liberal dreams

faced challenges in navigating structural inequalities and institutional barriers within the UK higher education institutions. These experiences raise concerns about viewing education as the singular pathway to success particularly for black and minority ethnic students.

5.2 Access to learning resources.

While some informants described supportive home environments with access to traditional educational materials like books, others encountered challenges in their access to formal resources. However, most informants emphasised a passion for learning can be nurtured even in environments with limited formal resources. For instance, Kehinde noted:

> *"There weren't many extracurricular activities, but there were many opportunities to learn from travel experiences." -Kehinde*

Kehinde 's quote highlights the importance placed on expanding knowledge beyond the classroom, showcasing how individuals can seek out diverse learning opportunities even when faced with constraints. Travel, for example, can expose individuals to different cultures, histories, and ways of life, fostering a broader understanding of the world and a deeper curiosity about different subjects. This finding aligns with the concept of "cultural capital," which encompasses not only formal education but also the knowledge and skills acquired through lived experiences.

Multiple material and emotional resources were identified in accounts as being beneficial to their future success. The informants described supportive home

environments that provided access to learning materials and encouraged a strong work ethic.

"My parents instilled the habit of reading regularly and encouraged me to manage my time effectively." -Chinonye

This quote by Chinonye emphasises her family's efforts to instil the love of learning and discipline for her personal and professional development. Chinyere also mentioned that, her family were supportive of her educational aspirations and pursuits.

"Education was highly valued in my family, and I was encouraged to excel academically." -Chinyere

This quote emphasises the cultural importance of education in Chinyere's background. Victoria 's experiences highlighted the benefits of access to resources at home.

"We had a lot of books and educational materials available, which helped us, stay engaged in learning." -Victoria

This quote by Victoria demonstrates the benefits of access to learning resources. In contrast, Wemimo mentioned that, she was the first in her family to study a STEM subject. Thus, she did not receive adequate support from her family for this specialist discipline.

"While I had access to education, there wasn't much discussion about STEM subjects beyond the school curriculum." -Wemimo

This quote by Wemimo suggests, she has inadequate access to learning resources to pursue a career in STEM field.

Yemi's educational background remains unclear regarding access to specific resources. Overall, the informant's narrative accounts highlight the influence of access to learning resources. While some informants had supportive home environments that fostered a love of learning, others faced challenges and inadequate access to learning resources to pursue a STEM career. Overall, the informant's experiences highlight the need for adequate access to resources to support diverse educational aspirations. Chinonye, Chinyere and Victoria describes having access to books and educational materials at home, suggesting a level of cultural capital that benefitted their learning. This relates to Bourdieu (1985) concept of 'habitus' where capitals, knowledge and dispositions are passed down from families. On the other hand, Wemimo's narrative accounts exemplifies this Bourdieu habitus theory that emphasizes on the disparity between the elite class and the working class as well as how the values of the schooling system are similar to the elite class. Wemimo's mentioned that, her family prioritised education despite their inadequate access to learning resources with this specialised discipline. This suggests that, access to resources can be geographically determined, creating educational disparities.

5.3 <u>Experience in formal educational settings</u>

This theme explores the informant's experiences within formal educational settings, I highlight both the positive and negative influences throughout their educational journey. The data collected shows that, there informants recollected the various teaching styles and resources used during their early years of schooling.

"Some teachers made learning engaging with activities and examples, while others relied solely on lectures." -Chinonye

Chinonye recollects the various teaching styles adopted by educators during her early years of schooling. Furthermore, other informants mentioned the importance of supportive peers and guidance from educators within their institutions.

"Having a strong group of friends helped me navigate challenges and feel a sense of belonging."-Chinyere

This quote emphasises the value of peer support and social networks. Chinonye also highlighted the benefits of personal tutor meetings as well as tutorials, study time that played a key role in the informants achieving academic success.

"My family instilled a love of learning and encouraged me to read ahead of my grade level, which prepared me for academic success."-Victoria

This quote demonstrates the positive impact of family involvement. Despite positive experiences; several participants faced challenges related to race and social background.

"Being one of the few black families in my community made me feel isolated and exposed to stereotypes." -Wemimo

Yemi also described experiencing micro-aggressions from peers.

"It was just a lot of...I mean it wasn't like an overt thing, like physical bullying or anything; it was more like micro-aggression, talking about my hair, touching my hair, making comments about my family or like stereotyping me..." -Yemi

Most informants encountered diverse teaching styles and academic resources during their early years of schooling. This underpins the reality of the diverse educational settings of the informants where various pedagogical approaches and resources vary based on geographical location and social class disparity (see Chinonye and Wemimo perspectives on this issue). In addition, the informants highlighted the importance of peer support. However, 'geographical location' shapes the access to these resources and networks. For example, Wemimo mentions feeling isolated because her family were one of the few black families in her neighbourhood in London. Thus, this suggests that 'location' can shape the access to social support within educational settings. Overall, some informants encountered positive environments, others faced challenges race and social class discrimination. For example, Yemi encountered racial microaggressions while growing up and schooling in the South east of England. On the other hand, Chinyere had a different experience because she attended an all-girls school in Nigeria. This relates to CRT that emphasises the pedestrian nature of racism within western social institutions.

5.4.1 <u>Constructing a gender and racial identity</u>

It is important to how marginalised groups construct their social identities while navigating structural inequalities and institutional barriers within UK higher education institutions. This section provides an account of how the informants construct their own identity based on race and gender within a predominantly white and male STEM field. The data collected suggests that, the informant's identity construction is shaped by their family upbringing and community. For example, Kehinde describes being

surrounded by supportive women within her family and this fostered feeling of belonging and improved self-esteem.

"There wasn't really any other thing... but outside, I had a lot of women…" -Kehinde

Chinonye emphasises the influence of her Nigerian heritage on her academic drive, suggesting cultural values shape motivation.

"that spirit of excellence is embedded in you..."-Chinonye

Another sub-theme that emerged relate to shifting identities and social context. For instance, Chinyere 's experience illustrates how social context shapes racial identity. She did not identify as "black" in Nigeria but embraced that identity upon moving to the UK:

"I didn't have an identity as a black girl... I had an identity as a Nigerian." - Chinyere

This highlights the concept of racial consciousness emerging within different societal contexts. The follow up narrative focuses on how the informants navigate race and gender in predominantly white communities. Some informants (Victoria and Wemimo) mentioned growing up in predominantly white communities, navigating their identities as Black women:

"I didn't really feel that integrated to the wider community..." - Wemimo

Their experiences highlight the intersectionality of race and gender, and the challenges faced in integrating into predominantly white spaces. Wemimo describes feelings of isolation and difference due to race:

"That was very obvious all the time" -Wemimo

Chinyere expresses a sense of responsibility for representation as a Black person in a minority group

"You are very visible because you are not many, but you are also invisible because where is everyone else"-Chinyere

On the other hand, Yemi 's experience highlights the challenges faced by Black students in predominantly white schools. She describes micro-aggressions and feeling the need to prove themselves due to her encounter with overt racism from her PhD supervisor.

"She often made comments about my hair, being stereotyped..."-Yemi

In summary, the informants narrative accounts highlight the influence of family upbringing and community in shaping an individual development. Kehinde narrative account about supportive women in her family resisting traditions and cultural norms relates to the Coloniality of gender theory that suggests that, the globalised nature of patriarchy is an aftermath of colonialism that has shaped gender relations and roles in previous colonies ruled by the British empire. The pre-colonial societies possessed their own gender roles that emphasized the role of women. However, this was

changed during the colonial era. Presently, gender roles and relations are shaped by western patriarchal and capitalist systems (Mendoza, 2016).

Chinonye narrative account about how her Nigerian heritage plays a key role in shaping her aspirations in achieving academic success which relates to the theories including decolonial thought, coloniality and racial neoliberalism. Chinonye narrative account highlights the aftermath of colonial legacy of the British empire including global inequality, capitalism, racial neo-liberalism and Bourdieu cultural capital. The emphasis on the importance of education highlights the colonial perspective of most families in non-western countries which is to accrue capitals similar to the white British elites to achieve upward social mobility and academic success that underpins the values in a neoliberal and capitalist modern society (Kundnani, 2021). However, these informant's aspirations are negated and challenged by structural inequalities and institutional barriers that further marginalizes black women within a predominately white and male higher education landscape.

On the other hand, Chinyere narrative account highlights the shift in identity as she became 'race conscious' when she arrived the UK. Gillborn (2018) argues that, those who deny the existence of racism in the 21st century do not understand the extent to which racism shapes the experiences of people of colour both at an individual and structural level within multicultural societies. Chinyere narrative account relates to Hall (2000) arguments about race, identity and difference, he states that, identity is not fixed rather it possesses a dynamic nature that changes across time and place. For example, the concept of 'blackness' in Britain in the 1960's included non-white groups. This concept was named 'political blackness'. However, overtime scholars have

identified the limitations of this definition because it homogenises the experiences of non-white groups and overlooks the tensions between these non-white groups.

Some informants including Victoria and Yemi narrative accounts highlight the Crenshaw (1991) intersectionality theory, in which black women face multiple oppressions based on their race, gender and class membership. In similar vein, Hill-Collins (1986) argues that, black women's experiences have been omitted in mainstream sociology by white men. Thus, black women who face unique challenges have a unique standpoint to theorise about their own experiences. Drawing on this theoretical lens, black women are able to uncover the marginalisation and uneven power dynamic in dominant society. Wemimo narrative account relates with Kundnani (2021) racial neoliberalism theory that emphasises the uneven distribution of resources, wealth and opportunities based on racial hierarchy shaped by systemic racism which is a colonial legacy of the British empire. Chinyere's sense of responsibility for representing Black people in a minority group relates with Decolonial Thought's emphasis on dismantling power structures and giving voice to marginalised groups. Yemi 's experience with racial micro-aggressions and the pressure to prove themselves, due to their race, resonates with CRT's view of how racial bias manifests in everyday interactions. This can also be understood through a Racial Neoliberalism lens, which suggests that even seemingly fair environments (schools) can perpetuate racial inequalities.

5.5 Constructing a STEM identity

Constructing a STEM identity is a multifaceted process, particularly for Black women in academia. While existing scholarship offers various definitions of STEM identity, this study conceptualizes it as an evolving sense of self that encompasses one's beliefs, values, and interests related to science, technology, engineering, and mathematics. It's a dynamic interplay between personal and social factors, shaped by experiences within family, educational settings, and broader societal contexts.

In this section, I delve into how the participants' STEM identities were shaped and reinforced over time. Family background emerges as a significant influence. Kehinde's experience with a father in STEM influenced her initial interest:

"I started choosing more of science... I wanted to be in science class" (Kehinde).

Societal expectations are also another factor. Chinonye highlights the cultural emphasis on prestigious STEM careers within her community: "STEM subjects were always popular... prestigious careers".

Chinyere 's passion for problem-solving and academic success in STEM subjects fuelled her engagement: "I loved Maths... I loved solving problems". Yemi 's narrative demonstrates an evolving interest, shifting from creative pursuits to appreciating the abstract aspects of STEM.

Mentorship, role models, and peer influence are other factors influencing STEM identity construction. For instance, Wemimo emphasises the influence of teachers, friends, and community members who shared their experiences:

"I think my journey probably was influenced by teachers as well... And my friends... you kind of catch that passion as well".

This highlights the importance of representation and mentorship in fostering STEM interest among underrepresented groups. In summary, these narratives underscore the complexity of constructing a STEM identity for women. It is a journey shaped by personal interests, family background, societal influences, and access to positive role models. The influence of family background aligns with Bourdieu's Cultural Capital Theory and Habitus, where exposure to specific fields within the family environment can influence career aspirations. The influence of societal expectations aligns with Racial Neoliberalism, which argues that, in minority communities, there is significant pressure can pursue careers seen as markers of success within dominant societal structures. Intrinsic motivation also drives interest in STEM, regardless of background. This was evidenced in Chinyere 's passion for problem-solving and academic success in STEM subjects which fuelled her engagement: "I loved Maths... I loved solving problems". The study also highlights the importance of representation and mentorship in fostering STEM interest among underrepresented groups. This aligns with Decolonial Thought's emphasis on dismantling power structures and amplifying marginalised voices to create more inclusive spaces in STEM fields.

5.6   Selecting a STEM Career

This section covers the factors that shaped the black women's selection of a STEM career. These factors include personal interests, family and community influences, educational experiences, role models and mentorship. In addition, these decisions were shaped by the existing shortages of black women academic in the STEM field within UK higher education institutions. Most informants mentioned, high-paying job prospects shaped their decisions in selecting STEM subjects.

Kehinde mentioned that, her aspiration to pursue a STEM career was shaped by her passions for health-related fields and her deep-longing to improve the lives of others. She considered health-related disciplines including medicine, paediatrics, obstetrics, and nursing.

Kehinde 's choice reflects her attraction to professions that involve direct engagement with people and the opportunity to positively impact their well-being. Her comment about considering midwifery and her aunt's role as a midwife exemplify her appreciation for healthcare providers who serve their communities. Additionally, Kehinde 's awareness of the challenges faced by nurses in terms of low pay and lack of respect influenced her decision-making process.

For Chinonye, she noted that:

> "I enjoyed research, studying... I enjoyed passing on knowledge... community engagement... making research accessible... not yet recognised... early in my career."

Chinonye 's decision to pursue a STEM career was influenced by her enjoyment of research, studying, and teaching. She finds fulfilment in sharing knowledge and making research accessible to the public. Although she has not yet been recognised, she remains optimistic about future achievements and recognition in her early career stage. Her motivations align with intrinsic factors associated with job satisfaction, such as a passion for the subject matter and a desire to make a positive impact. The lack of immediate recognition reflects the challenges faced by early-career professionals, particularly in academia, where recognition often comes with time and established expertise. In summary, Chinonye 's narrative account reflects the complex interplay of personal experiences, cultural influences, and societal expectations in shaping her access to learning resources, educational experiences, and career choices within the broader social, political, and historical context.

Chinyere , on other hand, explained her decision to pursue Microbiology, stating that, *"Microbiology just seemed very interesting because it seems to cut across, it's very wide in scope."* She was drawn to the multidisciplinary nature of Microbiology, which allowed her to explore different aspects of the field. Her interest was further reinforced by attending a lecture or workshop where a Microbiologist introduced the discipline and sparked her enthusiasm. Chinyere 's decision to pursue a Ph.D. in Microbiology was influenced by her positive undergraduate project experience and the guidance of her project supervisor.

To Victoria , her aspirations to stay in academia and pursue a career as a lecturer or senior lecturer were her motivating factors. She acknowledges the competitiveness and challenges, particularly for a black woman, but affirms her determination to pursue

her goals. Her desire to balance research and teaching indicates her interest in contributing to the STEM field through academic work.

Wemimo discusses her journey in selecting a STEM career, particularly her specialisation in neuroscience and her decision to pursue further education through a bachelor's, master's, and Ph.D. She describes initially choosing neuroscience due to her personal interest and finding it one of the few subjects that captivated her attention. She later gained exposure to the practical aspects of her field during a placement, which solidified her motivation to pursue further study.

> *"I think that kind of showed me that I like the job that comes afterwards... I could focus on one thing for a couple of years and then be considered a professional at it or be somewhat of an expert in it."-*
>
> *Wemimo*

Wemimo 's decision to pursue a STEM career was driven by a combination of personal interest, exposure to practical applications within her field, and a desire for expertise and professional growth. Her statement suggests that the realisation of her passion for the work itself and the prospects of becoming an expert in her chosen field motivated her to pursue higher education and a career in STEM. Her journey reflects the importance of personal interest, practical experiences, and the desire for professional growth and specialisation in shaping career choices. Her narrative aligns with the broader societal context of the growing demand for STEM professionals and the need for diverse perspectives and expertise within these fields.

Lastly, Yemi 's motivation to pursue a career in academia and STEM fields emerges from her experiences of under-representation. She mentions not seeing many black female academics while growing up, which inspired her to challenge this lack of representation. Her experiences of discrimination and low expectations also motivated her to excel academically and prove herself. These factors influenced her decision to select a STEM career and actively work towards increasing representation and inclusion.

5.7 Conclusion

The informant's narrative accounts provide in depth insight into the informant's perspectives on home cultures, the value of education, access to learning resources, early years' experience in educational settings, race and gender identity construction, formation of STEM identity and selecting STEM careers for black women. These themes have been 'located' within the broader social political and historical context in which these experiences occurred following Goodson and Sikes (2001) genealogy of the context approach. The informants narrative accounts were traced back to broader social, political ad historical factors influenced by coloniality, capitalism, racial neo-liberalism and coloniality of gender.

In summary, the informants narrative accounts reflect the interplay between race, structure and agency. This includes the mutual effect between the black women early career academics and broader social structures as well as the informant's agency to initiate conversations for social change to create an equitable, diverse and inclusive environment that reflects the changing demographic of STEM students within UK higher education institutions.

Chapter Six

The representation and experiences of black women in STEM fields within UK higher education institutions

6.1 Introduction

This chapter provides an overview of the informant's narrative accounts concerning the underrepresentation of black women early career academics in the STEM field within the UK higher education institutions. It examines how these informants navigate systemic racism and institutional barriers within the UK higher education institutions. In this chapter, there are recommendation for policy makers to take continued measures to address race and gender discrimination. This chapter highlights the informant's 'voices' and 'counternarratives' who are continuously marginalised within this predominantly white and male institutions.

This chapter is divided into four main themes including 'the representation of black women early career academics in the STEM field within UK higher education institutions', 'the experiences of black women early career academics in the STEM field within UK higher education institutions', 'Views on gender, race and promotions' and 'Opportunities and mentorship'.

Overall, the informants narrative accounts are not 'representative' of this demographic group and cannot be generalised. Instead, these informants narrative accounts provide an in-depth insight into their unique experiences and the strategies adopted in navigating challenges within the UK higher education institutions. This relates to Hill-Collins (1990) black feminist thought suggesting that, black women experiences have been omitted from mainstream sociology within the academy. This theoretical

concept examines the power dynamic between the dominant white race and the minority black women. In summary, Hill-Collins (1990) suggests that, black women have a unique standpoint to theorise about their experiences because they will uncover the present structural inequalities within the academy. This chapter examines how the informants elaborate on how their experiences shapes their career progression within UK higher education institutions. Based on data collected, the informant's experiences were shaped by gendered work cultures, implicit bias, feelings of exclusion and isolation.

6.2 The representation of Black Women in STEM Fields within UK higher education institutions

Black women are largely underrepresented in the STEM field within UK higher education institutions. A Royal Society (2020) survey shows that, there are less than 2% of black women in the STEM field within the UK higher education institutions. This is a global issue as STEM is perceived to be a 'survivor of the fittest' discipline that requires specialised knowledge and skills. However, this misconception overlooks the structural inequalities and institutional barriers that limit the aspirations of young black girls in the STEM field. These factors include racial stereotyping and lower teacher expectations that shapes young black girls' aspirations to pursue social science subjects while overlooking STEM subjects (Archer et al, 2015). The section explores the following factors that contribute the shortages of black women early career academics in the STEM field within UK higher education institutions.

i.   Lack of role models: There are very few black women in STEM fields, which can make it difficult for black girls and young women to see themselves in these fields. (King and Pringle, 2019).

ii.   Lower teacher expectations: Black women in STEM fields often face racism and micro-aggressions from their colleagues, professors, and supervisors. This can make it difficult to feel welcome and supported in the field (Archer et al, 2015; Gordon *et al.*, 2022; Lomer *et al.*, 2018).

iii.   Unconscious bias: This can also prevent black women from being successful in STEM. For example, studies have shown that professors are more likely to give positive feedback to white students than to black students, even when their work is equally good (Tate and page, 2020).

The informants narrative accounts highlight the mobility of students, knowledge and academic resources beyond geographical borders (Zajda, 2020). The composition of the sample population includes individuals from commonwealth countries following the Britain's colonial past of global domination and civilising the world. Most informants aspired to study in UK higher education institutions because of its world-class standard. Most informants identified a persisting issue within the academy which is the existing underrepresentation of black women academics within UK higher education institutions. Most informants mentioned, they were the only black woman in their department.

Chinonye was aware that, she was the only black woman in her department. She showed concern for the underrepresentation of Black and Minority Ethnic academics within UK higher education institutions.

"I am aware that I am in the minority, in STEM and in academia. I don't see a lot of women in my position right now and that can be discouraging, it can be intimidating when it comes to relatability, you know umm, I am trying to pursue this, but I can't see anyone who looks like me there. " - Chinonye

This quote shows that, Chinonye is aware that she is in the minority. However, she contradicts herself when she earlier stated that:

''Umm…how do I feel? I really enjoyed it. I think it is great and it is fast-paced, demanding area, but umm, yeah, I do feel a little bit of pressure, whilst I haven't like experienced discrimination because of my race, or gender but I can recall, I am aware that I am in the minority, in STEM and in academia''.-Chinonye

Chinonye account is quite complex. She makes contradictory statement by stating she has not personally experienced race and gender discrimination. However, as her account unfolds, she shows awareness that, there are quite a few Black and Minority Ethnic academics with UK higher education institutions. This complexity within her account is worthy unpacking, in how Chinonye constructs herself as an agentic neoliberal subject focused on 'making it' regardless of the challenges she may face while achieving her goals. This could involve downplaying how certain social structures and systems of oppression shapes her identity as a 'victim' as this may disrupt her own self-perception as the ideal neo-liberal subject. While reflecting on Chinonye earlier accounts about her childhood, her parents emphasised the importance of education as a form of gender empowerment. However, Chinonye is now faced with structural inequalities and institutional barriers that are unique to black women academics. Chinonye's narrative account highlights the tensions black women

face in negotiating their presence and progression within UK higher education institutions. Chinonye's narrative accounts relates to the work of Hill-Collins (1990) 'outsider-within' suggesting that, black women experience less feelings of belonging within the academy because they are positioned as outsiders within spaces reserved for elite white men. This uncovers the power dynamics of oppression that marginalises black women and omits their 'voices' and 'experiences' from mainstream sociology.

In similar vein, other informants expressed similar concerns. For example, Chinyere mentioned that:

'I am aware that, I am in the minority in the STEM field and this lack of representation can be discouraging and intimidating'-Chinyere

'When I see individuals that look like me in senior positions, it is important for relatability'-Chinyere

This quote shows that, Chinyere would like to see more black role models and mentors in senior positions. This would support young black girls aspirations in the STEM field within the UK higher education institutions (Archer et al, 2015).

Kehinde also highlighted that she felt isolated in her department due to being the only black woman. She mentioned that even though there were other women, they did not share her racial background. This shows that, Kehinde felt less feelings on belonging despite the presence of other women who did not share her race and ethnic identity in her department.

Another informant, Yemi discussed how she initially felt like the only black woman in her department, which led to her experiencing isolation. She recognised that there were other women, but they were not of the same racial background.

Wemimo shared her struggles of being one of the few Black women in her field. She spoke about creating a space to discuss these experiences and finding comfort in connecting with other black women in different institutions who had faced similar challenges. The sentence also provides more detail about Wemimo 's experience, specifically how she found support by connecting with other black women who had faced similar challenges.

Victoria expressed her awareness of being a minority as a black woman in STEM. She discussed how the under-representation of black women made her question her place in the field and affected her confidence. Victoria highlighted the importance of seeing role models who look like her for relatability and inspiration. The sentence also provides more detail about Victoria 's experience, specifically how she felt like she did not belong in STEM because of the lack of black women role models.

Within these accounts, the informants consistently spoke about being the only black woman in their respective STEM departments. They emphasised the importance of representation in fostering a sense of belonging, relatability, and inspiration. They noted that even when there were other women in their departments, the lack of shared racial background created a feeling of isolation.

The participants did not explicitly explain the reasons for their apparent isolation, but it can be inferred that the lack of diversity, both in terms of gender and race, played a

significant role. The colleagues in their departments were predominantly white and male, which contributed to their feelings of being different and isolated. The informants reported feelings of isolation and invisibility demonstrating a broader structural issue including the lack of diversity in the STEM field within UK higher education institutions.

The data collected shows that, the lack of relatability and the underrepresentation of black women in the STEM field within UK higher education institutions that shaped their perceptions, identities and experiences within academia. The informants mentioned, feelings of isolation, discouragement, intimidation and lack of role models and mentors.

Most informants identified the lack of diversity in the STEM field within the UK higher education institutions. For example, Chinonye also shared her experience of feeling pressured:

"I do feel a little bit of pressure, whilst I haven't experienced discrimination because of my race, or gender but I cannot recall." -

Chinonye

The lack of diversity is directly tied to the pressure that Chinonye feels. While she has not experienced explicit discrimination based on her race or gender, the absence of representation, role models, and a diverse community creates a unique pressure. This pressure might arise from visibility and relatability, isolation, higher expectations, and the imposter syndrome, where she feels inadequate despite her achievements. The absence of relatable peers can exacerbate feelings of not belonging, increasing the pressure to prove oneself.

In similar vein, Chinyere was aware that, she was in the minority. Chinyere states, "*we are a very small group of black STEM professionals.*" Chinyere further conveyed a similar outlook to Chinonye's. Furthermore, Chinyere 's statement, "*I will say that the biggest pressure is that for you to be considered the same, you have to produce more than others. I will say that is the biggest pressure and it really comes from management,*" reflects how she feels the need to outperform her peers to be seen as equal. This pressure arises from her awareness of being part of a small group of black STEM professionals, which likely contributes to her feeling of hyper visibility. The expectation to produce more than others to gain recognition suggests that she perceives a disparity in how her achievements are evaluated compared to her peers. To prove her detractors wrong or to highlight her greater capacity than her lab peers, she always has to prove her merit and worth.

While Chinonye and Chinyere spoke specifically to their departments, Kehinde spoke about the representation of black academics in the entire institution and the reality of the institution. She expressed her feelings as the following:

> "*…in my school, I can count the black professors, in my department alone, there are just two of them. There are just two in the whole department, so that's to tell you that in the midst over like 30 or 40, you are going to see two of them. In the school, there are not plenty at all, they are just very few. They are not up to 15, that's how small they are....may be part of it, I don't really know it, how long are we going to continue like this, how long are we going to have just a few blacks.*" –
>
> *Kehinde*

In the above quote, Kehinde expressed her observation and concern about the lack of representation of black professors and academics within her school and department in the STEM field. She notes that in her department, which consists of around 30 to 40 individuals, there are only two black professors. She further emphasises that this scarcity of representation extends to the entire school, where the number of black academics is fewer than fifteen. Kehinde 's frustration with this lack of diversity is apparent as she questions how long this under-representation will persist. Her sentiment reflects her dissatisfaction with the slow progress being made in achieving diversity and inclusion within academia. She believes that the pace of change is insufficient, and she questions the sustainability of such low representation of black individuals in higher education institutions. Her comment about having only a few black academics indicates her belief that this disparity negatively impacts the university's ability to reflect the broader demographic makeup of society.

The effects of this slow progress in diverse recruitment are significant both personally and professionally for Kehinde. These include:

i. Lack of role models: Fewer black role models can lead to isolation, hinder aspirations, and limit mentorship.

ii. Sense of belonging: Low representation of black academics can create a sense of not belonging and make experiences feel unacknowledged.

iii. Professional opportunities: Limited presence of black academics can impact collaboration, research partnerships, and networking.

iv. Institutional culture: Lack of diversity can perpetuate a homogeneous culture that may exclude or disadvantage certain groups.

v.   Impact on research: Diverse perspectives enrich research outcomes and prevent neglect of certain areas.

Kehinde 's frustration with the slow progress in diverse recruitment highlights the urgency of addressing issues of representation, equity, and inclusion within higher education institutions. It underscores the need for proactive efforts to attract, retain, and support individuals from under-represented backgrounds in STEM fields.

Like Chinonye, Kehinde believed that she would be prepared for the world beyond academia by creating a path for herself.

> *"So, there is not a lot of space for people like my colour up there so, … I must see how I can create a path for myself. I need to be more open-minded and see what happens."* - Kehinde

Kehinde 's statement reflects her embrace of a neoliberal subjectivity, which is an ideology that emphasises individual success, competition and self-reliance. She acknowledges the challenges of being a black woman in academia, but she is determined to create her own path and succeed.

Yemi conveyed a similar outlook to those of the other informants which were lack of representation and relatability, pressure and expectations, frustration and urgency for change, and neoliberal subjectivity and individual agency. She, however, expressed how her aspiration and perspective to address the under-representation of Black women in STEM field had changed over time.

> *"I feel two different types of pressure. I feel the work pressure, but I also feel the pressure from my community in a way. Remember I mentioned*

that my motivation was seeing that there wasn't many black academics in particular many black female academics and I wanted to kind of fill that gap, be part of filling that gap but then while that was my motivation. It is difficult because when I see other female academics like myself, I am seeing the stress they are put under, the obstacles they are facing as well from their own department where their progress is almost being capped. So, it is like they are amazing in the work that they do, they are very qualified, they are overly qualified as well and yet the institutions is like a barrier to them. The institutions that they work in. And I think I have just been seeing these. I wonder if it is even possible to get to these points really?" - Yemi

Yemi discusses experiencing two different types of pressure in her career: work pressure and pressure from her community. The way pressure is constructed in her accounts is influenced by various factors, including her personal motivations, the expectations of her community, and the challenges she perceives within the institutional and academic environment. For the work pressure and institutional pressure, Yemi acknowledges the work pressure associated with her role as a post-doctoral researcher in the STEM field. This pressure likely stems from the demands of conducting research, managing projects, and meeting the expectations of her academic position. Additionally, she mentions the challenges of teaching and the administrative tasks that come with it, which can contribute to her feeling overwhelmed. The institutional pressure refers to the expectations and demands that the academic environment places on her. She mentions how there are barriers and

red tape that can create obstacles, particularly for black female academics. This pressure can manifest in expectations for research output, publications, grant applications, and navigating career progression.

Yemi 's community pressure is rooted in her desire to contribute to addressing the under-representation of black academics, especially black female academics, in her field. Her motivation to be a role model and fill the gap she perceives; is a form of internal and external pressure. She feels driven to succeed not just for herself but also for her community. This pressure can be a source of inspiration and motivation, but it can also be daunting, as she compares herself to the challenges faced by other black female academics. Yemi acknowledges that while she wants to contribute to change, she also sees the immense stress and obstacles that her colleagues are dealing with. This duality of motivation and concern creates a complex pressure dynamic.

Her negotiation and navigation of these diverse pressures involve a balancing act between her personal aspirations, community expectations, and the realities of the academic environment. She is grappling with whether she wants to continue in academia or explore the clinical route. This decision-making process requires her to consider her own well-being, her professional goals, and the challenges she anticipates facing. Navigating these pressures involves making choices that align with her values and aspirations while also acknowledging the systemic barriers she and her colleagues might encounter.

Wemimo speaks about the isolating experience in her academic journey: "*I would say, yeah, and I think also the prospects and the fear that you're investing is often quite sacrificial.*" Her words encapsulate the sense of sacrifice that accompanies pursuing

a doctoral degree, compounded by the realisation that few share her background. In confronting gender and racial dynamics, Wemimo acknowledges, "*Based on my race, I know that my race impacts the way I speak...cultural things that I do.*" She candidly points out the intersection of race and gender that shapes her interactions, emphasising the complexity of navigating spaces that often demand conformity.

Also, Wemimo's assessment of admission policies is direct: "*I don't think the distribution is fair enough... some of the policies are discriminating.*" Her observation echoes the inequities ingrained in the STEM admission process, where biases can unintentionally limit the opportunities available to Black women scholars. Her aspirations echo her dedication to driving change: "*In ten years, I hope to be leading a research group which benefits the Black Community.*" Her vision underscores the importance of representation in research leadership roles, aiming to amplify the voices and concerns of marginalised groups. Wemimo 's narrative underlines the uphill battle Black women face within UK higher education institutions. Her story calls for systemic change that addresses the unique challenges encountered by Black women in STEM fields. The theme of "Representation of Black Women in the STEM Field" remains a vital conversation that requires action for a more inclusive academic landscape.

In general, the participants' accounts highlight both commonalities and divergences in their experiences, responses, and perspectives on this issue. For commonalities, all participants expressed the challenges of being among the few, or the only, Black women in their STEM departments. This lack of representation impacted their sense of belonging, relatability, and feelings of isolation. Additionally, the participants stressed the importance of having role models who look like them within the STEM

field. They emphasised that the absence of relatable role models affected their aspirations, confidence, and motivation.

Furthermore, the participants shared a sense of pressure arising from the absence of representation. This pressure was both internal, driven by personal motivation to address the representation gap, and external, influenced by community expectations and institutional demands. They were driven by a desire to make a difference and overcome barriers in academia. However, this motivation also brought about stress due to the systemic challenges they faced.

Despite the commonalities, there were certain divergences. While some participants embraced a neoliberal approach, aiming to forge their own paths and succeed despite challenges, others like Yemi expressed scepticism about the sustainability of change and the obstacles faced by Black women academics in the system. Yemi specifically discussed the pressure from her community to fill the representation gap. This external pressure, while motivating, also added complexity to her career choices. There was also a divergent opinion on the scope of concern. Kehinde extended her concern beyond her department to the entire institution, emphasising the scarcity of Black professors and academics in the STEM field. Her frustration reflected her dissatisfaction with the slow progress of diversification. Divergent opinions were also given on intersectionality. For instance, Wemimo highlighted the intersection of race and gender in her experiences. She discussed how her racial background impacted her interactions, speech patterns, and cultural expressions.

In summary, the participants' accounts collectively underscored the urgent need for increased representation of Black women in STEM fields. The common themes of

isolation, lack of role models, and external pressures formed the backdrop against which individuals responded differently based on their aspirations, outlooks, and experiences. While some participants leaned toward individual agency and the pursuit of their own paths, others voiced scepticism about the possibility of creating significant change within the existing structures. Despite these differences, all participants shared a commitment to addressing the under-representation issue and acknowledged the complexities of navigating a predominantly white and male academic environment.

6.3 Experiences of Black Women as early career academics

The education and career trajectory of informants as early career academics varied among informants. While some of the informants (Chinonye and Victoria) were completing PhDs and working in other jobs, others were doing full time PhD work (as first year PhD student) combined with other research duties. Out of the six women, only Chinyere was a full lecturer with secure tenure at the time of being interviewed. The rest of the participants were precariously employed in casual academic jobs. Each informant spoke about their experiences at different stages of working in the STEM field, with regards to coping in a predominantly 'white' and 'male' environment.

The above finding confirms the statistics on the current systems of structures of UK academia which paint a worrying picture. According to the Higher Education Statistics Agency (HESA, 2022), the number of casual academic contracts in the UK has increased by 40% in the past decade. This means that more and more early-career researchers are finding themselves in precarious employment, with little job security or benefits. This trend is particularly pronounced in STEM fields. A Royal society (2020) report found that only 12% of STEM professors in the UK are women, and that

women are more likely to be employed on casual contracts than men. This gender disparity is likely due to a number of factors, including unconscious bias and a lack of female role models in STEM fields. Some of the strategies implemented by the informants were finding ways of navigating challenges based on the awareness that, they were in the minority within their department. This was evident across all narrative accounts and the women emphasised various ways in which they navigated these challenges.

Chinonye described her experiences in Higher Education and working in the STEM field. Chinonye 's narrative account revealed a narrative where she overcame a range of barriers, including stereotyping and lower teacher expectations. The findings are not generalisable because this study was conducted in the UK where they informants reside. The UK has a previous colonial past that has enduring challenges including global inequality, racism and patriarchy. As a result, black students are often stereotyped as less intelligent than their white peers (McGee and Bentley, 2017). These negative stereotypes were shaped by lower teacher expectations that can further influence the academic attainment of black students.

Chinonye elaborated about being the only black girl in her class made her feel like she did not belong and how the less than preferential treatment made it difficult for her to see a future for herself in STEM. She described how she was one of the few black girls in her class during primary school and noticed that black girls sometimes received less favourable treatment from teachers. In secondary school, she observed stereotypes associated with black girls, such as being labelled as loud or disruptive. Chinonye also highlights how non-black counterparts seemed to receive more support

and opportunities when it came to university applications, which made her feel that she had to work harder to receive the same recognition.

"Sometimes when it came to giving support, with applications, sometimes our non-black counterparts will get that support and that extra push in terms of opportunities and guidance whereas we will have to like really to push for that extra support…"- Chinonye .

Chinonye spoke about the importance of support and mentorship in her academic journey, but she did not provide specific examples of the support she received or observed. She emphasised the importance of mentorship in terms of career progression, funding opportunities, and educational development. However, she did not mention any specific instances where this support was given differentially based on race or ethnicity. It is possible that Chinonye did not experience any differential treatment based on her race or ethnicity. However, it is also possible that she did experience this type of treatment but did not feel comfortable or safe sharing her experiences. It is also possible that she simply did not notice any differential treatment.

Without more detailed information, it is difficult to say for sure whether or not Chinonye experienced differential treatment based on her race or ethnicity. However, her emphasis on the importance of support and mentorship suggests that she believes that these resources are particularly important for black students and other underrepresented groups.

Chinonye also indicated that she enjoyed the teaching in Higher Education.

"My university experience, yeah, the teaching was fine, some lecturers were better than others... practical classes were always fun and engaging, because it was practical, very visual, and hands-on"-Chinonye .

Kehinde further described working in STEM field as a great, fast-paced, and demanding area. She had not had work-life balance due to the pressure from working in the STEM field within the UK higher education institutions.

"One of the major challenges is that either your children will suffer, or your work will suffer. First, there are long hours. There are two things in academia: you are either a lecturer or you do research... so this REF and TEF that they get you to do. You will be teaching and then you will be doing research, which is very tedious from what I have seen, it is very hard. So instead of your normal 37.5 hours, you are doing 70 hours a week. Now imagine doing 70 hours a week, and you have a child, so one thing is going to suffer. It is either you are not doing very well at work, or you are doing well at home. How many children do you have? That is another thing, and how many spaces do you have for those children"-Kehinde .

This quote relates to CRT perspective suggesting that, the assumption that academics are single and childless without caring responsibilities is a form of racism. This assumption ignores the fact that many academics, especially women, have caring responsibilities. These responsibilities can add to the workload of academics and make it difficult to balance work and family life. Furthermore, the model would also argue that the long hours and demanding nature of academic work can make it difficult for women carers to succeed in academia. This is because women carers are often

expected to take on more of the unpaid care work, such as childcare and eldercare. This can make it difficult for them to find the time and energy to do their academic work.

CRT can help us to understand the challenges faced by women carers in academia and to develop strategies for addressing these challenges. For example, CRT would argue that institutions need to provide more support for academics with caring responsibilities. This could include flexible working arrangements, childcare support, and paid parental leave. In addition, CRT would argue that there is a need to challenge the assumption that academics are carefree. This could be done by raising awareness of the challenges faced by women carers in academia and by changing the culture of academia to be more supportive of carers.

Chinonye, like Kehinde, talked about how much she enjoys her work activities.

> *"I enjoyed teaching; I enjoyed passing on knowledge and seeing students' response to new information. I enjoyed the questions that they asked, showing that they are engaged. I enjoyed community engagement as well, because it means bringing your research to the public, making it accessible"*- Chinonye .

Chinyere , on the other hand, noted that because she was not struggling academically and financially, she was able to cope as a minority in predominantly White and male institution in ways other Black women may have not been able to.

> *"We didn't really think so much about gender or race and there might have been things that were happening but we were totally oblivious to it because I have all this privileges around me I wasn't struggling academically, I wasn't struggling*

financially and am not saying that if you struggle then you will have, but I think that the same things that we experienced shaped our perception of a particular situation." - Chinyere

Chinyere further described the level of cohesion among the Black and Minority Ethnic group in STEM during her higher education, underlining the complex interplay between heritage, affinity, and shared ambition.

"I had a very good student peer group, I guess at the time maybe we didn't realise, but we kind of connected on our either that we had African heritage or for some of us that we had actually lived in Africa so we just kind of congregated together and because we connected in our first year we kind of really stayed together, like we weren't in campus university like we were all coming from home but we will sit together in classes, we took the same modules and I think that that really shaped my university education because I was in a group of people who were very focused on what we wanted to do well" - Chinyere

Chinyere's opinion aligns with the theoretical underpinning of the similarity-attraction paradigm, which posits that individuals are naturally drawn to those who share similar characteristics, attitudes, and backgrounds. This alignment is evident in her description of the level of cohesion among the Black and Minority Ethnic (BME) group in STEM during her higher education, as well as her observations about the challenges and opportunities faced by individuals with common characteristics.

In accordance with the similarity-attraction paradigm:

1. Shared Characteristics and Affinity: Chinyere 's recognition of the cohesion among the BME group in STEM indicates that individuals with common characteristics, in this case, shared ethnicity and experiences as under-represented minorities, tend to form connections and alliances. This is consistent with the theory's premise that people are attracted to those who share the same characteristics. Chinyere 's statement that "*we are a very small group of Black STEM professionals*" underscores the awareness of shared ethnicity and its potential influence on forming bonds within the STEM community.

2. Shared Ambition and Resilience: Chinyere 's observation that the BME group in STEM shares a similar outlook with Chinonye 's, particularly in terms of feeling pressure to outperform, highlights a shared ambition within the group. This shared ambition, driven by the desire to excel in a field where representation is limited, is akin to a common attitude. It reflects the similarity-attraction paradigm's notion that shared goals and attitudes foster affinity among individuals.

3. Positive Outcomes of Similarity: The data analysis also alludes to positive outcomes of similarity beyond attraction. Chinyere 's description of cohesion and support within the BME group in STEM corresponds with studies including Juvonen *et al.* (2019). These studies argue that demographic similarity positively influences friendship ties, communication frequency, and even resilience. In Chinyere 's context, the shared characteristics and common

experiences contribute not only to a sense of belonging but also to a support network that can enhance resilience in the face of challenges.

Drawing on Bourdieu's concepts of social capital and habitus, Chinyere 's observations can be further contextualised:

1. Social Capital: Chinyere 's description of the cohesion among the BME group in STEM aligns with Bourdieu's notion of social capital, which refers to the resources embedded in social networks. The support, advice, and sense of belonging within the BME group constitute a form of social capital that members can tap into to navigate challenges and pursue their aspirations.

2. Habitus: Bourdieu's concept of habitus, which refers to the ingrained dispositions and attitudes shaped by an individual's social background, resonates with Chinyere 's account of shared ambitions and attitudes within the BME group in STEM. The common experiences of being underrepresented and striving for recognition can contribute to a shared habitus that influences how members approach their career trajectories and challenges.

Chinyere is a passionate STEM advocate who is dedicated to fostering knowledge exchange and supporting aspiring students, particularly young black girls, who are interested in STEM careers. She is a mentor to many students and is committed to addressing the under-representation of minorities in the field. Despite her substantial contributions and leadership role as a course leader, Chinyere has not been promoted to a senior lecturer position. This raises important questions about the factors that influence career progression in academia.

One possibility is that Chinyere 's educational background has played a role. She did not complete a master's degree before her PhD studies, which may have influenced perceptions of her qualifications within an academic landscape that often values specific credentials. While her extensive experience and contributions should merit recognition, the hierarchical nature of academia and institutional expectations might have disadvantaged her due to a perceived shortfall in formal qualifications. Another possibility is that racial dynamics and systemic inequities are at play. Chinyere is a black woman, and the STEM field is still dominated by white men. The systemic biases that can marginalise black scholars, despite their competence and achievements, could be reflected in the challenges she faces in advancing to a senior lecturer position. These biases might be perpetuated through unconscious bias, lack of representation in decision-making roles, and an environment that fails to address ingrained inequities.

To engage in deeper analysis, we need to critically assess whether the emphasis on formal qualifications aligns with the demonstrated competence, leadership, and impact that Chinyere has exhibited in her role. The system's strict adherence to educational prerequisites could overlook valuable contributions and potentially hinder diverse talents from ascending to higher positions. There is also a need to challenge racial biases and consider the structural barriers that disproportionately affect black scholars. This situation prompts reflection on whether the institution is actively challenging these biases or inadvertently perpetuating them. It underscores the need for comprehensive diversity and inclusion efforts that address systemic racism at all levels.

Finally, there is need to recognise non-traditional pathways to success in academia. Chinyere 's journey, while not conforming to the traditional academic trajectory, presents an opportunity to reconsider the types of experiences and skills that contribute to success in academia. Recognising and valuing non-traditional pathways could enrich diversity and bring valuable perspectives to the field.

The above corroborate the findings by previous studies that ethnic minority staff and faculty are under-represented in senior positions and are more likely to be employed on temporary or fixed-term contracts. They are also less likely to progress into leadership positions, despite having similar qualifications and experience as their white counterparts. In corroborating this view, studies have shown that racial hierarchies have remained widespread in the UK higher education system despite the introduction of Race Relations Amendment Act in 1968 and the Equality Act 2010, which outlawed discrimination of any sort from the workplace. Prior literature has supported this view, as most ethnic minority employees in the UK have faced racial harassment and unfair treatments in the workplace. Also, these ethnic minorities generally face inequalities in income, training and promotion (Wood head *et al.*, 2022). A University and College Union (2016) report shows that, 90% of ethnic minority individuals within the UK higher education institutions faced barriers to training and promotion. Furthermore, 59% of employees across all sectors reported that their managers and senior colleagues did not provide support to them while seeking promotions in their careers (University College Union, 2016).

Chinyere confirmed that there are policies in place to promote equality, diversity, and inclusion (EDI) in her institution. However, she noted that the extent to which these

policies affect individuals is "*a totally different thing.*" This suggests that while some progress has been made in developing EDI policies, more needs to be done to ensure that these policies are actually implemented and that they have a real impact on the experiences of individuals.

Kehinde, who started her PhD programme with a 4-month-old son, narrated her experiences at different moments. Unlike Chinyere and Chinonye, Kehinde felt that being a mother meant surviving with some support from colleagues and management.

"I started my PhD with my son who was four months old, and there is this parity that, okay she is a lady, and she has a child and they can make some allowances for her. There are some places that I have taken my child to ...may be conferences or seminars, when my child has been able to be with me." - Kehinde

She says that over time, research, and community engagement have become her priority as she did not teach.

"I don't teach, so that is one limitation of my PhD, I don't teach, I don't have the opportunity to teach. I have enjoyed the outcome of my research and community engagement, I've loved. Because now I work as a Research Assistant and I've loved the community engagement, I also love the product of the research; I love it because it makes me have an idea of especially migrants in the UK. I've seen how community engagement plays a role. "- Kehinde

Kehinde 's statement about research and community engagement becoming her priority, while she did not teach, relates to the prior points. For instance, she described the challenges she faced as a mother working in the demanding field of STEM within

UK higher education. She talked about the difficulties of balancing long working hours with taking care of her child, suggesting that being a mother affected her ability to maintain a work-life balance. Kehinde 's statement also highlights a shift in her career focus and choices. While she initially navigated the challenges of being a mother in academia, she has since revaluated her priorities. Instead of trying to juggle teaching responsibilities along with research and community engagement, she appears to have decided to prioritise research and community engagement over teaching.

By stating that she did not teach, and that research and community engagement have taken precedence, Kehinde 's experience contrasts with the experiences of some of the other individuals discussed earlier, such as Chinonye, who expressed enjoyment in teaching. Kehinde 's shift away from teaching might be influenced by her unique circumstances and experiences as a mother and a researcher.

This shift could also have implications for her career trajectory within academia. While the text does not explicitly state her career level, it could be inferred that she has chosen to focus on areas that align more closely with her research expertise and interests. This shift might have an impact on her opportunities for advancement within the academic hierarchy, which often values a combination of teaching, research, and engagement activities.

Kehinde 's experience adds another layer to the broader discussions of diversity and representation within academia. Her experience as a mother and her decision to prioritise certain aspects of her academic work reflect the complex factors that can influence the choices and paths of underrepresented individuals in STEM fields. Overall, Kehinde 's statement underscores the multifaceted nature of career

trajectories, and the decisions individuals make as they navigate the challenges and opportunities within academia. It provides an additional perspective on the experiences and choices of individuals within the context of early career researchers and underrepresented groups in STEM fields.

Further probing reveals that Kehinde as a mother working in the UK STEM field faces unique challenges in achieving work-life balance. She often juggles the demands of work and caring responsibilities.

> *"My job does not allow me to work from home all the time, I only work from home once a week, that is on Friday, when would you have time? And I leave home by six and I come back by six because I work in another city, that is a challenge, there is no body to take care of your child so one person has to find a way."- Kehinde*

Despite this challenge, Kehinde has found a way to achieve work-life balance by requesting her partner to support in caring responsibilities. This can allow them to better balance their work and caring responsibilities and reduce the stress and strain of juggling both.

> *"So, my husband will be the one to be at home because my son has to go to school by 8:14am." Kehinde*

> *"I don't teach, so that is one limitation of my PhD, I don't teach, I don't have the opportunity to teach. I have enjoyed the outcome of my research and community engagement, I've loved. Because now I work as a Research Assistant and I've loved the community engagement, I*

also love the product of the research; I love it because it makes me have an idea of especially migrants in the UK. I've seen how community engagement plays a role. "-Kehinde

Teaching had a complex role. As Kehinde noted, it could provide further opportunities and bolster early careers. However, across the accounts, the women noted that performance in areas such as teaching is not valued in the STEM field as much and therefore many of them did not enjoy teaching.

Yemi has reported that teaching was her least favourite task.

"Not the teaching aspect. I haven't necessarily enjoyed the teaching aspect. I have held workshops and facilitated some modules. Supervised undergrad students and master's students and things like that. I won't say I have necessarily enjoyed the teaching aspect of things…" – Yemi

There was more than one mention of the informants having to work harder and not being recognised or offered the same opportunity. This was echoed by Victoria when she noted that:

"I see that more senior academics are more likely to push and kind of connect other students to other academics or other collaborations when it's not a black student… I'm not offered the same opportunities as other PhD students and I think that is related to my race." - Victoria

Yemi the other early career academic who got her appointment in 2020 shared similar sentiments. In response to my question if she was feeling any specific pressure

working in the STEM field. This section explored the experiences of Black women as early career researchers in the STEM fields. The section highlighted the diversity of their experiences, from completing PhDs while working other jobs to engaging in full-time PhD work. It also emphasized the prominence of precarious employment in academic positions, especially in STEM fields, and the challenges of working in predominantly white and male environments. The section discussed how these challenges are reflected in statistical data, such as the increase in casual academic contracts and the gender imbalance in STEM professorships. The experiences of the informants resonated with these statistics, highlighting the additional hurdles faced by Black women in academia due to their race and gender. The acceptance of being a minority and the only Black person in such spaces was a recurring theme among the participants.

The section particularly highlighted the experiences of Chinonye, who shared her journey of overcoming barriers, stereotyping, and lower teacher expectations. Her account shed light on the systemic biases within the UK education system, stemming from its history of colonialism and racism. Chinonye 's observations on the lack of support and opportunities for Black students in comparison to their non-Black counterparts were significant.

The section also discussed the significance of mentorship and support, as seen through Chinonye 's perspective. While she emphasised the importance of these factors, she did not provide specific instances of differential treatment based on race

or ethnicity. This raised questions about the impact of such support on under-represented groups in academia.

Kehinde 's experience as a mother and an early career researcher offered insight into the challenges of achieving work-life balance in STEM fields. Her need to juggle caring responsibilities alongside demanding work hours highlighted the unique struggles faced by women in academia who are also caregivers. Chinyere 's experience as a passionate STEM advocate and mentor to aspiring students brought attention to her leadership role as a course leader. Despite her substantial contributions, she had not been promoted to a senior lecturer position. This prompted critical analysis of factors influencing career progression, such as formal qualifications, racial dynamics, and systemic inequities.

Finally, the section delved into the importance of recognising non-traditional pathways to success in academia, highlighting Kehinde 's choice to prioritize research and community engagement over teaching. The role of diversity and representation in academia was also addressed, with a focus on the underrepresentation of ethnic minority staff in senior positions and the challenges they face in training and promotion. This section sets the stage for the next section, which will focuses on the views of these early career researchers on gender, race, and promotion within the context of their experiences as Black women in STEM fields.

6.4 Views on gender, race, and promotion

Black women are underrepresented in senior positions in UK higher education, despite the increasing population of Black women enrolling in undergraduate degrees in STEM field. They face both overt and covert forms of racism and sexism, and 90% of black and minority ethnic staff have reported facing institutional barriers when seeking promotion (University College Union, 2019).

A study of black women in UK higher education found that they often had to be prompted to think of instances of discrimination based on gender.

> *"Where my gender or race played a role… (long pause) Umm, I really trying to think…Not really. Umm…not that I can vividly remember, like I don't remember…I don't recall missing out on an opportunity because am black or because I am a woman. (Giggles) I am trying hard to think about it because I…yeah…"* - Chinonye

The giggle in Chinonye 's response could stem from nervousness or discomfort, surprise or disbelief: The giggle could also stem from her genuine surprise or disbelief that she has not vividly remembered any instances where her gender or race played a role in her experiences. This might be unexpected for her, and the giggle could reflect her surprise at not recalling any specific incidents.

While responding to my question regarding positive or negative experience encountered where race and gender played a role, Kehinde stuttered:

> *"May be in the UK or other places, okay, the positive side of gender is okay"* - Kehinde

In similar vein, Yemi mentioned that most of the experiences impacted by race and gender were more noticeable while pursuing further education including postgraduate research degrees than during undergraduate degrees.

"I haven't had any negative experience during undergrad to do with my gender or my race or my ethnicity. I think mainly it was during my PHD and I think it was more challenging to face that during my PHD because I had to work so closely to the person who was committing it against me. - Yemi

For this study, the fact that I had to prompt the informant to reflect on instances of discrimination based on gender suggests that, these gendered experiences were less overt or recognisable for the informant than the experiences based on race. This could be attributed to the intersections of race and gender discrimination which can make it difficult to distinguish discrimination based on race or gender. The implications of this negative experiences can be significant because it shows that black women unique experiences of bias are not fully recognised and addressed. This could potentially shape the informants job satisfaction, career progression and motivations towards their STEM career paths. In summary, this issue requires intersectional measures to address the implicit bias shaping black women's experiences in the STEM field within UK higher education institutions. This includes targeted training and development programs that address the unique challenges faced by black women in the STEM field, as well as changes to policies and practices that promote diversity and inclusion.

6.5 Opportunities and Mentorship

The evidence gathered shows that black women in STEM fields are often overlooked for opportunities such as internships, apprenticeships, and research opportunities,

limiting their ability to gain the experience and exposure necessary for career progression. Despite these challenges, there are many black women who have successfully navigated these challenges and achieved academic success within their respective disciplines. For instance, Kehinde expressed the challenges she faced as a black woman working in academia in the UK. She is concerned that her race and visa status will hinder her career advancement. She may not be able to access all the opportunities available to other researchers because of visa restrictions.

Kehinde 's concerns are relevant to this study. Black women in academia face several challenges, including racism, sexism, and tokenism. They are often under-represented in leadership positions and are less likely to receive funding for their research.

> *"Here as a black woman, I am not entitled to public fundings, so those challenges will make you reconsider".-Kehinde*

Kehinde's opinion above resonates with the colonial welfare system, which was designed to benefit white people and to disenfranchise black people (Curtis and O'Connell, 2017). This system is still in place today, and it continues to have a negative impact on black women. For example, black women are less likely to be eligible for public funding than white women. This is because the system is based on a set of assumptions about who is deserving of help, and these assumptions are often based on racial stereotypes. CRT can help to challenge these stereotypes and to expose the racism of the colonial welfare system. It can also help to develop strategies for dismantling this system and for creating a more just and equitable society.

Black women also face unique challenges in finding mentors and sponsors who understand their experiences and can provide support and guidance.

> *"You don't have the networks and how do you get the networks? how do you build the network? how long will it take me to get that network because I am just a starting working-class woman. The black women are very few so how do you reach out to some of them. You need to calculate yourself to be asking the right questions so you don't waste anybody's time. So yes, those are the challenges."* Kehinde

The above quote from Kehinde confirmed Bourdieu's view that social class is not simply a matter of income or wealth, but also of one's access to resources, such as education, networks, and cultural capital. Kehinde highlighted the challenges that black women face in academia, particularly in terms of their access to networks. Networks are important for career advancement, as they provide opportunities for mentorship, collaboration, and support. However, black women are often excluded from these networks due to racism and sexism.

Bourdieu's concept of "habitus" can help us to understand the challenges that black women face in building networks. Habitus is a set of dispositions that are acquired through one's social class background. These dispositions can include ways of thinking, feeling, and behaving that are advantageous in one's social milieu. For example, black women who come from working-class backgrounds may be less likely to have the social skills and cultural capital that are necessary to navigate the academic world. They may also be less likely to feel comfortable reaching out to others, as they may have experienced discrimination in the past. Bourdieu's concept

of "field" can also help us to understand the challenges that black women face in building networks. A field is a social space where people compete for resources and power. The academic field is a particularly competitive field, and black women are often at a disadvantage due to racism and sexism.

However, there are also examples of successful mentorship programs that have helped to address these challenges. For example, the informants mentioned networks that support BAME academics and enables them build required networks for their career progression within the UK higher education institutions.

> *"We do have specific networks, through the university for women in science and research and also for BAME, they have BAME networks, so just kind of giving support about writing grants and research, career progression, setting you up for mentorship, things like that, but then, they are actually really useful, really useful" -Chinonye*

Most informants were aware of the opportunities in STEM fields, and they understood the importance of networking with other black women and mentoring young black girls aspiring to work in the STEM field. All the informants participated to an extent in activities including career growth and networking outside of their academic work. Chinonye was the most active as she participated in programmes including 'Continuous Professional Academic Development', a free day course to improve her teaching and research skills.

Chinonye participated in incorporated modules like self-reflection and giving feedback. This means that the programme helped her to learn about herself and her strengths

and weaknesses, and how to give and receive feedback effectively. Chinonye has also participated in other career growth programs, including the Diversifying Leadership Program and the Aurora Leadership Development Program. These programs are specifically designed for people from Black, Asian, and Minority Ethnic (BAME) backgrounds who want to enter leadership positions in the university.

Both Wemimo and Victoria have participated in career growth programmes such as Ringfenced and the BAME early careers conference. Wemimo noted that:

"There's something called the BAME early careers conference, and that is run by and doctor (fake name: James) from a London based university. And that is a great place for professional development. And they're targeted towards underrepresented groups and underrepresented BAME students. There are a lot of social impacts groups, I would say that provide professional development. So groups, non-profit groups, for instance, Black Women in Science network, there's like black in Neurosciences. And a lot of other non-profit groups that help with professional development, I would say in that respect that are specifically targeted towards underrepresented groups." - Wemimo

Unlike the other informants, Victoria reflected on the opportunities for black women, the lack of transparency in the admission process, its impact on the under-representation of black women in STEM fields.

6.6 Conclusion

This chapter explored the complex and often overlooked experiences of Black women in STEM fields at UK universities. Using a qualitative analysis of interviews with Black

women working in these fields, the chapter revealed a nuanced picture of their unique challenges and the intersections of gender, race, and other factors that shape their experiences. Critical Race Theory (CRT) was used to dissect these narratives, uncover counter-narratives, and highlight the need for intersectional approaches to understanding the multifaceted dimensions of their experiences.

The key findings of the study resonate deeply with the lived realities of Black women in STEM. The high levels of underrepresentation, both in leadership positions and opportunities, point to systemic barriers that need to be addressed. The difficulty in recognizing instances of discrimination based on gender or race reflects the subtle nature of intersectional discrimination, which requires more sophisticated analysis. The challenges in securing mentorship and networks further underscore the need for targeted support to address the unique obstacles that these women face. The experiences in academia reflect broader societal issues, as these challenges are intertwined with racism, sexism, and unequal access to resources.

CRT has been instrumental in providing a robust framework for understanding the experiences of Black women in STEM at UK universities. It has facilitated a deeper analysis of power structures, the impact of historical legacies, and the insidious nature of intersectional discrimination. CRT has helped to uncover counter-narratives, exposing the complexity of experiences that do not always conform to traditional perceptions. It has emphasized that race and ethnicity are inextricably linked with other factors such as gender, location, and responsibilities. CRT has provided a valuable lens for scrutinizing the systemic dynamics that perpetuate these disparities.

The experiences of Black women in STEM have highlighted the need for an intersectional approach to understanding their experiences. This chapter has shown how gender, traditional notions of femininity, motherhood, domestic responsibilities, and geographic location intersect with race and ethnicity to shape these women's experiences. Understanding the layers of influence helps to capture the true diversity and complexity of their struggles and triumphs.

The analysis in this chapter makes several significant claims. It underscores the underrepresentation of Black women in leadership positions and opportunities, pointing to systemic barriers. It highlights the subtle and often unrecognised nature of intersectional discrimination based on gender and race. The lack of mentorship and networks amplifies the urgency for tailored support mechanisms. The challenges in academia reflect broader societal issues, necessitating comprehensive change.

The next chapter will delve into the themes of inclusion and exclusion that arise from the analysis of Black women's experiences in STEM fields.

Chapter Seven

Inclusion and exclusion

7.1 Introduction

This chapter draws on Crenshaw (1991) intersectionality theory to critically examine the experiences of Black women early career academics in UK STEM fields. The chapter is structured into three key subsections: Experiences working in STEM field; Gender and Race Discrimination; and Challenges of Under-representation of Black Women in STEM fields. The chapter also provides conclusion by highlighting the complex interplay of race and gender in shaping the experiences of Black women in the STEM field.

7.2 Black women's experiences working in STEM fields.

Prior literature has identified that Black women early career academics in the STEM field face unique challenges that impact their career progression within the academy. This section critically analyses the experiences of Black women early career academics in UK STEM fields, shedding light on the unique barriers they face, the impact of intersectionality on their professional journey, and the potential implications for their career advancement. For instance, Kehinde described her experiences working in STEM as being "frustrating" and "restrictive." She mentioned being hired as a research fellow but being assigned responsibilities that align more with a senior research fellow.

> "No, on paper it is research fellow, but the work is a senior research fellow... I am now like the one running the project... Sometimes you are very high

qualified... but many a times with our qualifications we get roles that are very below us... we are paid lower than that." – Kehinde

She also talked about the lack of opportunities to teach, and the lack of funding for research on Black populations:

"*Yes, there are still limited opportunities to teach... It is still happening till now... It was specifically written there... They talk about them. They tell them 'Oh you are on your student PhD studentship; this is where you will be teaching'... they don't consider any other person.*" – Kehinde

Kehinde's experiences reflect the systemic undervaluing and under-utilisation of Black academics in STEM. She describes a mismatch between her qualifications and the roles she is offered, as well as barriers preventing her from engaging in teaching and advancing her career. These experiences align with the broader context of systemic inequities and biases within academia, where Black women may face limited opportunities for growth and recognition.

Kehinde 's experiences are not unique but similar to those of Chinyere's. Chinyere reflected on the significance of discussing these experiences in an interview, as it makes the limitations and gaps in representation more tangible and real. Through these discussions, she recognised the importance of resilience and a proactive attitude to focus on what is within her control.

"It is always useful to kind of reflect on where one is... But I think that from that kind of thinking, also comes the resilience and proactive attitude to focus on what is within my own ability and keep working on that." - Chinyere

Chinyere emphasises the issue of invisibility for Black women in STEM, stating that they often go unrecognised and lack institutional-wide acknowledgment for their contributions. She explained that while individual colleagues and students may appreciate their work, there is a lack of widespread recognition within the institution itself. Chinyere attributes this to the institution's failure to capture and appreciate their value, leaving the acknowledgment to senior managers who may have their own biases.

> *"There is this thing of being invisible as a Black female particularly in STEM... There is no real desire to actually acknowledge the fact that this person is a valuable member of the team."* – Chinyere

> *"Sometimes it is because the institution itself does not have a way of really capturing that, and so it is left to probably senior managers who then will acknowledge based on their own individual biases, so I think yes."* – Chinyere

She also raised concerns about the unequal distribution of mentoring opportunities. While there is typically a mentoring process for new academics, she noted that some individuals have mentors assigned to them, while others do not. This discrepancy can affect the support and guidance available to Black women in their early career stages. Additionally, Chinyere highlighted the challenges that arise when mentors transition to become champions, as Black women may lack advocates who can vouch for their achievements and support their progression.

Chinonye's experiences diverge from the previous narratives. She finds fulfilment in teaching and passing on knowledge, as well as engaging with the community. While she has not yet been recognised for her work due to being early in her career, her aspirations for advancement demonstrate her commitment to excellence and growth in the STEM field.

> *"I enjoyed teaching; I enjoyed passing on knowledge, and seeing students' response to new information." Chinonye*

She also appreciated community engagement, as it allows her to make research accessible and create a level playing field.

> *"I enjoyed community engagement as well because it means bringing your research to the public, making it accessible... level playing field and making it relatable." Chinonye*

Chinonye, however, mentioned that she has not been recognised for her work yet, as she is still early in her career.

> *"On my way, I am so quite early in my career." - Chinonye*

To Victoria, being the only Black person in her team made her feel excluded and not fully belonging.

> *"Until more recently, me being the only Black person in my team... feeling kind of excluded... you don't fully belong." – Victoria*

She also noted that the majority of individuals in top senior positions in her field were white men, with white women being more represented at the early career stage. This

pointed to a lack of diversity and representation at higher levels, suggesting a hierarchical structure that favours white individuals, particularly men.

> *"The people in most top senior positions in my field are white men... you're seeing that gap narrow a bit more towards people who are early career academics."* – Victoria

Victoria 's experiences shed light on the issue of exclusion and lack of representation faced by Black women in the UK STEM field. Being the only Black person in her team, she feels a sense of exclusion and highlights the under-representation of Black individuals in top senior positions, particularly white men. Victoria also calls for transparency in the admission and funding processes for postgraduate STEM programs, emphasising the need for more funding opportunities for Black and minority students.

> *"What is it about this application process, about this admission process that is not accommodating for Black students?"* – Victoria

Wemimo 's experiences highlight the mismatch between the teaching approach in universities and her preferred learning style. She also expresses a lack of personal interaction and motivation from her lecturers, which affected her engagement and drive. However, her current work environment is described as inclusive, emphasising the importance of fostering a diverse and supportive environment in STEM.

> *"For me, it's not the best way that I learned, I don't learn the best that way. Yeah, so it was very teacher-style learning, very lecture-style learning"* - Wemimo

"I didn't have a personal interaction with any of my lecturers, I would say. So there wasn't really much motivation to do to run as I did during my secondary school education" - Wemimo

Furthermore, Wemimo highlighted the importance of finding a supportive work environment. She described her current work environment as inclusive, with efforts made to make her feel included.

"They've made an effort to make me feel included... Luckily, the group I'm in right now is quite diverse" - Wemimo

Yemi 's experiences reflect a mixed academic journey. While her undergraduate degree did not fully nurture her potential, her master's program and PhD provided opportunities for personal and career development. Yemi emphasised the importance of time management, stress management, and resilience during the challenging PhD period.

Overall, the experiences of these women collectively reveal a larger pattern within the STEM field, where Black academics are consistently undervalued and underutilised. For instance, Kehinde's experience of being assigned lower-level responsibilities despite her qualifications aligns with CRT's critique of racial hierarchies within institutions. She is denied opportunities for advancement due to her race and gender. Chinyere 's experience of invisibility and lack of recognition for her contributions reflects CRT's assertion of how racial bias can marginalise accomplishments. Her dependence on potentially biased senior managers for recognition reinforces this point. The lack of recognition Black women face can also be seen through Bourdieu's

lens. The dominant culture within STEM may not value the specific skills and knowledge they bring, limiting their ability to gain recognition within the field's established hierarchy. Chinyere's concerns about unequal access to mentorship can be understood through Bourdieu's concepts. Black women may lack access to social networks that can provide mentorship opportunities, hindering their career progression. Victoria's feeling of exclusion as the only Black person in her team resonates with Decolonial Thought's critique of power structures that perpetuate marginalisation. The dominance of white men creates a sense of "otherness" for Black women. Issues of limited funding for research on black populations as narrated by Kehinde highlight the ways in which dominant knowledge systems within STEM may prioritise other areas of inquiry. Decolonial Thought calls for valuing diverse perspectives and research agendas.

7.3 Black women's experiences of gender and race discrimination

Gender and race discrimination have been recognised as the two most pervasive forms of discrimination in STEM fields. To this end, responses from informants on whether they had experienced race discrimination while studying and working in higher education were analysed. In her response, Kehinde talked about the gender and race discrimination she has faced in STEM. She described being told that she is "not good enough" and that she "does not belong" in STEM fields. These comments reflect the stereotypes and prejudices that Black women face in the STEM field. These stereotypes can make it difficult for Black women to feel confident in their abilities and to be taken seriously by their colleagues.

Kehinde also discussed the barriers faced by Black academics in building networks, finding mentors, and securing sponsorships, which are crucial for career advancement. She highlighted the additional challenges faced by Black academics, who often have to work twice as hard to access the same opportunities as their white counterparts.

> *"It is somebody else they bring, either you see one other white lady, one other person... Leadership is white, white, white... I don't think they are very welcoming of Black people, not to talk of Black women." –* Kehinde

> *"Because of the way the world is changing... blacks don't have [the right network], blacks don't have that... it takes a lot for you to break through... most of the funding that comes in health are not focused on Black people." –* Kehinde

The above pointed to a systemic bias and discrimination that Black academics face in their professional development within the STEM field. The experiences shared by Kehinde reflected the intersectional challenges faced by Black women in STEM. Not only do they confront gender biases that are pervasive across the field, but they also face racial discrimination and a lack of representation in leadership positions. These factors compound the barriers they encounter and contribute to their under-representation within the STEM field.

Chinyere 's narrative echoed the pervasive gender and race discrimination present in STEM fields. She noted that Black women, specifically, face invisibility and a lack of institutional recognition.

"There is no way to progress... if you are not publishing papers... there is no way to progress and what you gave them on their time is predominantly teaching, except you are asking them to do the research work in their own time which many of us do." – Chinyere

She was very keen to share her experiences of non-promotion despite being research active. She raised concerns about biases in recognition and praise for their work, stating that it often depends on individual perspectives rather than objective assessment criteria. Chinyere observes disparities in praise and acknowledgement between Black women and their counterparts, highlighting the need for systemic change to address these biases.

"When you are one Black woman in the department, the BME students will come to you because they feel they can relate to you... And if there is no progression that recognises that very hard work that you do, I think that is going to be a very big barrier." – Chinyere

Regarding mentoring, Chinyere agrees with another respondent who mentioned that white students often have opportunities to collaborate with white lecturers, whereas Black students rarely have access to similar relationships. She attributed this disparity to biases and acknowledges that it contributes to the challenges Black women face in STEM. Chinyere suggested that biases against Black women begin early in their academic journeys, leading to under-representation and limited access to mentoring and support networks.

On the contrary, Chinonye noted that she did not vividly experience racism or sexism during her university years or in her current job. However, she acknowledged that she was aware of being in the minority as a Black woman in STEM and academia. Her awareness of her minority status indicates an understanding of the broader context of gender and racial disparities within STEM fields.

> *"I can't see anyone who looks like me there... it can be discouraging; it can be intimidating when it comes to relatability." Chinonye :*

> *"I don't see a lot of women in my position right now... trying to also maintain a level of excellence so not to lose... set a good example with... amongst my Black and non-Black counterparts." Chinonye:*

> *"I think it is just about having a common goal... I don't think gender or race connected me to anybody... I have a positive working relationship with my colleagues." Chinonye:*

On the other hand, Victoria's experiences reveal the intersectionality of gender and race discrimination. She discusses the differential treatment and lack of validation she receives compared to her white counterparts, emphasizing the need for recognition and fair evaluation of her work. Her observations highlight the insufficient consequences for not prioritising racial equity, underscoring the importance of incentivising diversity and inclusion efforts.

> *"Someone else who's not black, more specifically someone else who's white within my team... saying exactly the same thing and everyone is*

> *behaving as if that's the first time it's been said... my words hold less weight."* – Victoria

> "*When I speak, I'm much more likely to be interrupted... my white counterparts don't have to think about racism playing a part in their career progression.*" – Victoria

> "*There's not enough of a consequence for not prioritizing race... there's no incentivisation.*" – Victoria

Wemimo also encountered racial micro-aggressions in STEM. She noted that the lack of representation further illuminates the challenges faced by Black women in predominantly white spaces within STEM. She recalls,

> *"They'll just ask me something about being black, it'd be very triggering, it would really kind of distract them from what I was doing".* - Wemimo

These encounters highlighted the challenges faced by Black individuals in predominantly white spaces and the emotional toll it can take. Wemimo also pointed out the lack of representation and opportunities for Black women in STEM. She mentioned being one of the few Black women in her field, stating,

> *"There aren't many... postdoctoral Black students in my area, I would say even doctoral students, I don't know many in my area".* - Wemimo

This underrepresentation raises concerns about the barriers and limited pathways for Black women to advance in STEM careers.

Yemi's narratives illustrated instances of gender and ethnic discrimination within her university experiences, particularly during her PhD. Her encounters with micro-

aggressions and cultural insensitivity underscore the need for greater cultural awareness and sensitivity within the academic environment. Her scepticism regarding diversity and inclusivity initiatives highlights the importance of addressing systemic barriers and fostering a more inclusive and supportive environment. Overall, these women's narratives reflected the systemic inequities and biases deeply ingrained within academia.

In summary, the theme is centred on the experiences of Black women in STEM fields facing gender and race discrimination. Kehinde 's experience of comments suggesting she doesn't "belong" aligns with CRT's critique of racial stereotypes that portray Black women as outsiders in STEM. These comments also exemplify micro-aggressions, subtle forms of racism that can create a hostile environment. Similarly, Chinyere 's experience of invisibility and lack of recognition for her work aligns with CRT's critique of how racial bias can marginalise accomplishments of people of colour. Her work is not valued equally compared to white colleagues. Kehinde 's point about Black women having to work twice as hard for opportunities reflects CRT's assertion of racial bias within institutions. Black women may be excluded from informal networks that benefit career advancement; limited access to networks due to race can also be understood through Bourdieu's lens. Black women may lack the social capital needed to build relationships with influential figures within STEM.

7.4   The challenges black women face in relation to underrepresentation in the STEM field.

The under-representation of Black women in UK STEM fields is a complex issue that poses significant challenges. Despite increased efforts to promote diversity and inclusion in the workplace, Black women remain significantly under-represented in STEM fields. Several challenges leading to the under-representation of Black women were identified. One of the challenges relates to the societal and institutional influences during early years. This relates to effect of stereotyping Black girls have less aptitude and competency in STEM subjects such as further mathematics. Thus, several girls tend to develop a more negative attitude toward STEM subjects during the elementary and secondary school years. Stereotypes play a critical role in mathematics performance and, hence, their preparation for STEM. When other factors such as race and socio-economic status are considered, Black women become severely marginalised from entering and matriculating through STEM education programmes. For example, when Kehinde was asked to narrate how STEM subjects were talked about within the community she grew up, she responded that:

> *"That was boy's stuff. Girls did not have business with such conversations – joining such conversations would attract questions such, what are you doing here? "* -Kehinde

The stereotypes are transmitted in society, through parents, family members, teachers, peers, and the current explosion of social media. A wide range of scholars such as Shapiro and Williams (2011) have also laid credence to this fact that

stereotyping undermines women's interest and their performance in STEM fields even if they have a positive attitude toward STEM subjects.

Another challenge contributing to the underrepresentation of Black women in STEM field is the treatment Black women received in schools and beyond. Usually, in an attempt to create a structure aimed at minimising disruptions and ensuring to compliance, guidelines/policies are made that often represent the values and ideologies of the dominant members of society, resulting in the perpetuation of privilege and marginalization.

> *"I mean it wasn't like overt bully like physically bullying or anything it was more like micro aggression, talking about my hair, touching my hair, making comments about my family or like stereotyping me so it was little different things like this and it wasn't until year 11 that I found, that more Black people kind of moved to the area and I was actually able to feel a bit more comfortable, but then obviously by then we had done our GCSE season and it was time to move on"* - Yemi

The kind treatment received by Black girls was also echoed by Kehinde :

> *"Like in secondary school, sometimes like Black girls could be associated with been like loud, and disruptive.... in terms of like how we carried our hair, it's like a bit more, teachers were a little stricter with regards to that."* -Kehinde

Empirical evidence (Morris, 2016) has suggested that guidelines and policies continue to regulate hair styles, clothing, and verbal expressions often referred to as "attitude"

in case of Black girls. These vague and implicit guidelines are contributing to a significant percentage of Black girls, for example, being excluded from schools before they graduate. As noted by Morris (2016), when Black girls are pushed out for what are biased and unfair infractions, they are more likely to distrust the adults in the school environment and lose interest in their schooling because they perceive no one cares about them or their academic accomplishments.

Another challenge identified is that the critical under-representation of Black women and other ethnic minorities in leadership positions in STEM fields could potentially exacerbate their negative experiences. Chinyere described feeling isolated as the "only Black woman" in a department. This aligns with CRT's critique of racial tokenism, where a single minority presence does little to address the psychological impact of under-representation. The lack of role models and a sense of "otherness" lead to feelings of isolation and stress.

Mentorship and the burden of pastoral care were other challenges found. Chinyere highlighted the unique role Black women can play due to their shared experiences, with Black students often seeking them out for support. However, Bourdieu's concept of unequal social capital suggests Black women may lack access to mentors who "look like them," creating an additional burden of providing pastoral care while navigating their own career advancement.

There were also issues of unrecognised service and career progression. Chinyere argued that the lack of recognition for "pastoral care" aligns with CRT's critique of how institutions may undervalue the work of Black women. Their service to minority students is not valued equally compared to traditional academic pursuits, hindering

career progression. Kehinde discussed the concept of "invisibility" and the lack of recognition for Black women's contributions. This reflects CRT's assertion of racial bias within institutions. Black women's work may be overlooked or undervalued by managers with unconscious biases. Kehinde provided an example of a Black colleague who was demoted after maternity leave, suggesting unequal opportunities for advancement compared to white colleagues. Kehinde 's observation about mentoring programs not being equally accessible to all groups aligns with both CRT and Bourdieu. Black women may lack access to mentors who understand their specific challenges and can advocate for them within the existing social capital networks.

In summary, Black women in STEM fields face a double burden due to under-representation and a lack of recognition for their contributions. CRT and Bourdieu's theory offer valuable insights into these experiences. The lack of Black women in leadership positions creates a sense of isolation and limits access to mentorship. Furthermore, institutions may undervalue the service Black women provide to minority students and colleagues. Kehinde 's narrative aligns with the findings of Nicole and Isis (2019) and Obasi (2022), which highlight the existence of invisibility and a lack of institutional recognition for Black individuals in professional settings, including the STEM field. These studies support the passage's description of one person being praised while another is not acknowledged as a valuable team member. Nicole and Isis (2019) and Obasi (2022) shed light on the presence of institutional biases and the absence of effective mechanisms to acknowledge the contributions of Black individuals. They also reveal how invisibility can limit career opportunities and unequal access to resources, echoing the passage's assertion that the lack of institutional

recognition hinders opportunities for Black women in STEM. Kehinde 's observations of the absence of institutional-wide recognition resonate with these findings, suggesting that institutions may struggle to capture and appreciate diverse contributions effectively. The reliance on senior managers to acknowledge individuals based on their own biases further supports the notion that institutional recognition may be influenced by subjective perspectives rather than objective evaluation.

Other informants' responses suggest that individual biases by managers at the institutional level could possibly deter women's aspiration and interests in STEM related careers. Consequently, women withdraw from the profession, signalling a self-fulfilling prophecy. This is evidenced in the informants' responses. For instance, while Yemi was unsure on whether to remain in academia or pursue the clinical route, Kehinde planned to establish and manage a research-based non-profit organisation in 10 years, and she hoped to achieve this by using her research skills and other internal resource.

Overall, the narratives of Kehinde, Chinyere, Victoria, Wemimo, and Yemi collectively underscore the challenges faced by Black women in the STEM field. These challenges encompass gender and race discrimination, under-representation, and the need for systemic changes to create a more inclusive and supportive environment. Their testimonies shed light on the broader social, political, and historical context in which these experiences occur, highlighting the importance of addressing systemic barriers and promoting diversity and inclusivity in STEM fields. The insights shared by these individuals emphasise the need for targeted policies, mentorship programs, and initiatives that support the advancement and recognition of Black women in STEM. By

addressing these issues, society can work towards dismantling the barriers and creating a more equitable and representative STEM community.

7.5 Conclusion

This chapter has explored the experiences, challenges, and barriers faced by Black women early career academics in UK STEM fields. The narratives shared by the participants shed light on the complex interplay of race and gender in shaping the experiences of Black women in STEM. These experiences are deeply influenced by the wider societal and institutional contexts in which they operate. The participants' stories reveal the systemic inequities, biases, and discriminatory practices deeply ingrained within academia and STEM disciplines. From the narrative accounts of these women, it becomes evident that the broader contexts, circumstances, and power structures within the STEM field significantly influence the participants' identities, representations of themselves, and attitudes. The participants' experiences are deeply shaped by societal stereotypes, biases, and prejudices, which begin during their early years and continue throughout their educational and professional journeys. The intersectionality of race and gender compounds these challenges, further marginalising Black women and affecting their self-perceptions, confidence, and opportunities for advancement.

Furthermore, the lack of representation and diversity in leadership positions within the STEM field reinforces the structural inequalities and perpetuates the under-representation of Black women. The absence of institutional recognition and inadequate support systems undermine the participants' sense of belonging, motivation, and career progression. These findings highlight the urgent need for

systemic changes, targeted policies, and initiatives to address the challenges faced by Black women in STEM. The experiences shared by the participants emphasise the importance of promoting diversity, inclusivity, and equitable practices within academia and STEM disciplines. Mentorship programs, transparent evaluation criteria, and recognition mechanisms that value diverse contributions are crucial to creating a more supportive and inclusive environment. By creating a more supportive and equitable environment, society can work towards dismantling barriers and fostering the success and representation of Black women in STEM.

Chapter Eight

Discussion

8.1 Introduction

This chapter discusses how these informants' lives were constituted with the intersections of race, gender and neoliberal discourses. Although, the earlier chapters drew attention to racial inequality within UK higher education institutions citing theoretical concepts including CRT. This chapter focused on how these informants experience negotiate and challenge the structural inequalities and institutional barriers within UK higher education institutions. The informant's experiences in UK higher education institutions should constitute their 'life story', showing how their subjectivities and identities continue to be shaped as they participate in the STEM field within the UK higher education institutions. The informants 'life histories' which has been 'located' with broader social, political and historical contexts shows how the UK higher education institutions has been implicated in particular ways in the informant's narrative accounts through the lens of race, gender and neoliberal discourses. Furthermore, what are the implication of these informant's life histories for the STEM field within UK higher education institutions. This study highlights the needs for university management to consider the fundamental structures and systems that are racialised and gendered in light of the changing demographic of students in the STEM field within UK higher education institutions.

Through the data analysis, I uncovered complex and nuanced experiences of these informants, which I presented in three chapters (chapters 5, 6, and 7). The first empirical chapter (chapter 5), titled, Constructing an Identity through Critical Incidents,

delves into how the informants constructed their identity and navigated critical incidents that impacted their education and career trajectory. The second empirical chapter (chapter six), "The representation and experiences of black women early career academics in the STEM field within the UK higher education institutions," explores the informants' experiences of being a minority in their workplaces, including the challenges they faced and the support they received. Finally, the third empirical chapter, " (Chapter seven) ''Inclusion and Exclusion," uncovers the experiences of exclusion and the barriers faced by the informants in accessing higher education and progressing in their careers.

This analysis draws on the theoretical framework including, CRT, racial neo-liberalism, decolonial thought, coloniality of gender and Bourdieu capital theory. This analysis often draws on the genealogy of the context approach to provide in-depth insight into the informants narrative accounts and 'locates' this life stories within the broader social, political and historical context in which these experiences occurred (Goodson and Sikes, 2001). Based on the informant's narrative accounts and life histories, these women early life and upbringing shaped their motivations and aspirations as the 'ideal neo-liberal' subject meaning that, they strived for individual success and self-reliance in their education trajectory. However, these experiences were negated by structural inequalities and institutional barriers that posed challenges to their career progression in the STEM field within UK higher education institutions. This study highlights the 'voices' of marginalised groups as well as the informant's strategies in navigating systemic racism and institutional barriers within the academy.

8.2 Overview and Discussion of findings

This section provides an analysis that links the findings to the existing literature in this field to provide answers for the research questions.

8.2.1 What are the experiences of black women early career academics in the STEM field within the UK higher education institutions.

This section provides answers to the first research questions concerning the experiences of black women in STEM fields. The findings suggest that black women early career academics face complex and multiple oppressions. Considering that Black women have a multifaceted identity, these informants faced intersecting forms of oppression based on their race, gender, and social class that leads to feelings of isolation, hyper visibility and invisibility, and less feelings of social belonging in STEM fields. Informants acknowledged that they received differential treatments in their workplaces that led to loss of access to resources and networks that will enhance their career trajectory which were available to their white colleagues (Berends, Lucas, and Peñaloza, 2008; Ma and Liu, 2015; Rincon and Yates, 2018; Riegle-Crumb, King, and Irizarry, 2019). This view was pre-empted by Bhopal and Pitkin (2018), who argue that BME academics are continuously positioned as outsiders of the academy; they face overt and covert forms of racism in their workplaces. Consequently, BME academics choose to move to overseas higher education institutions due to the unfavourable conditions they experience within the UK higher education institutions. In addition, Rollock (2019) argues that black women are under-represented in professorship roles in the academy due to systemic racism, institutional barriers and structural inequalities that often undermine their academic competencies. Consequently, black women

experience feelings of isolation, imposter syndrome and inadequate support from their colleagues and institutions.

Black women have multi-faceted and intersectional identities. Thus, black women face multiple oppressions (Crenshaw, 1991). For this study, Black women's experiences were shaped by intersectional issues including race, gender and class discrimination based on the premise that most informants were from migrant families in the UK. Furthermore, these migrant families are predominantly of working-class background. Drawing on the genealogy of the context approach, the messages received by these informants from their parents and communities (see chapter 5) during their childhood shaped their aspirations for success and motivations for success. These messages include gaining the highest qualifications in a lucrative field to increase one's upward social mobility. Furthermore, this can be traced back to aftermath of colonialism also known as 'coloniality' where capitalist and neo-liberal ideals were extoled as the norm and became widespread through globalisation. These neoliberal ideals emerged from the demand of highly skilled professionals to fulfil the demands of the labour market. The effect of 'coloniality' meaning the longstanding patterns of power dynamics as a result of 'colonialism'. This coloniality shapes culture, labour, intersubjective relations and knowledge production beyond the colonial administration. Coloniality survives colonialism and this can be seen in the books, academic criteria, curriculum, cultural patterns and individual's self-image as well as their motivations and aspiration to pursue a career path (Maldonado-Torres, 2007).

I would argue that, the informant's aspirations were shaped by coloniality and western cultural imperialism. The informants aspired to become like their 'colonial masters' by

accruing social, economic and cultural capitals similar to that of the white British elites (Ayling, 2021). These informants positioned themselves as the 'ideal neo-liberal subjects' based on their upbringing, motivations and aspiration. However, the informant's neo-liberal dream was negated by structural inequalities and institutional barriers that pose unique challenges to black women and other ethnic minority individuals. Drawing on racial neo-liberalism, there is an uneven distribution of resources, wealth and opportunities based on the colonial legacy of racial hierarchy. Thus, these informants face unique challenges in gaining equal access to pay and promotions in comparison to their white colleagues (Kundnani, 2021).

Another finding includes international student mobility within UK higher education institutions has been shaped by globalisation and increased technological advancement. These factors have led to the mobility of scholars, ideas and knowledge that transcend geographical and cultural barriers (Zajda and Rust, 2020). The increase of international students in host communities gives rise to racial tensions that have shaped the experiences of informants in this study. Most informants could not recall the instances where they experienced discrimination based on gender, rather, they elaborated on their experiences with racial discrimination in the workplace. Although there were instances of gendered cultures within the workplace, these informants were eager to share their racialised experiences in the workplace.

> *"My university is very large; let me not lie to you. My university is very pro*
> *white,.. I think they are yet to recognise the blacks very well in the school, so,*
> *I think it is something that the BAME community understand so, again like to*
> *tell you how bad I guess it is. My director of study is still the one in charge of*

racial inclusivity, she is the one who chairs gender, and she keeps telling me

that wellbeing what we black African she succinctly tells you that the

University is too wide to recognize who you are, but they will not say they

have this British way of doing things, they just laugh at it. They just keep

saying diversity-diversity, I think since I've been in this school for the past four

years, they only talk but they don't do anything about it'' -Kehinde

In similar vein, Yemi mentioned that most of the experiences shaped by race and gender were more noticeable while pursuing further education including postgraduate research degrees than during undergraduate degrees.

"I haven't had any negative experience during undergrad to do with my gender

or my race or my ethnicity. I think mainly it was during PHD and I think it was

more challenging to face that during my PHD because I had to work so closely

to the person who was committing it against me. –Yemi

However, Chinonye narrative account was quite complex. She contradicted herself, when she said that, she had not experienced race and gender discrimination throughout her education journey. However, she is aware that, she is in the minority within academia. Chinonye narrative account highlights the dichotomy between the hegemonic narrative and counter-hegemonic narrative. In other words, her narrative account is quite complex because it shows that, she has agency to identify instances where she has been treated differently or not and she is not trying to re-echo the findings in the extant literature about Black and Minority Ethnic academics experiences within UK higher education institutituions. However, she does not

invalidate this issue because she is aware of the underrepresentation of black women and other ethnic minority academics within UK higher education institutions.

"Where my gender or race played a role… I am really trying to think…Not really. …not that I can vividly remember, like I don't remember…I don't recall missing out on an opportunity because am black or because I am a woman. (Giggles) I am trying hard to think about it because I…yeah…" - Chinonye

While interviewing these informants, I had to prompt them to recollect and reflect on instances where they experience gender discrimination. These informants narrative accounts highlight that, they were aware of race discrimination than gender discrimination. Thus, this makes it difficult to identify systemic issues that may be gendered. However, I identified the gendered work culture that persists in formal educational settings in these informants' responses. For example, there little or no provisions for Kehinde, a black mother to maintain her caring responsibilities while pursuing her academic career. To corroborate this view, Ong, *et al.* (2011), Black women face intersectional issues of race and gender bias which persists in the STEM field which is predominantly a white and male profession. Furthermore, this implicit and unconscious bias shapes the education and career trajectories of black women and other ethnic minority women in the STEM field within UK higher education institutions.

I would argue that, coloniality of gender plays a key role in shaping the informants downplaying the role of gender discrimination in limiting their career aspirations. Instead, the informants pursued their aspirations based on their motivations shaped by their upbringing in an African household (Deslandes et al, 2022). These motivations

could have made them turn a 'blind eye' to negative experiences based on race and gender discrimination. Considering the intersectional issues faced by black women in the STEM field within UK higher education institutions, most informants could not identify when they were treated differently based on gender or race because of the overlapping nature of these oppressions. Prior studies – as highlighted in Chapter two - demonstrate that Black women face unique challenges based on the intersections of race, gender and social class membership that limits their advancements within UK higher education institutions (McCluney *et al.* (2021); Dawson (2019); Rollock (2019). These studies highlight the importance of recognising and addressing these challenges to promote equality, diversity, and inclusion within the academy. Furthermore, the intersectional nature of race and gender discrimination is most relevant in this study. Considering that, there are overlapping oppressions that pose unique challenges for black women in the STEM field within the UK higher education institutions.

This section consists on steps taken to analyse the evidence gathered and how these themes emerged. After obtaining a narrative from each participant pertaining to their experiences during their schooling, the next step, involved eliciting additional information from them concerning their encounters as early career researchers operating within the STEM field. The first informant discussed is Chinonye, who shared her experiences in higher education and working in the STEM field. Her life history revealed how she overcame various barriers, such as stereotyping and lack of support for black women. In an interview, she discussed how being the only black girl in her class made her feel like she did not belong, and how non-black counterparts received

preferential treatment in terms of academic support and opportunities. Despite these challenges, she enjoyed teaching in higher education, and described working in the STEM field as a great, fast-paced, and demanding area. However, the pressure from working in this field within UK higher education institutions often made it difficult for her to maintain work-life balance. This was due to the long hours required, and the challenges of balancing work and caring for children as well as facing unique challenges with regards to her race and gender membership.

Chinonye, like the other informants, expressed her enjoyment in her work activities, particularly in teaching and community engagement where she found satisfaction in passing on knowledge and making it accessible to the public. She also appreciated the engagement of her students and the questions they asked. On the other hand, Chinyere, who in her account did not note facing academic or financial struggles, found it challenging to cope in predominantly white and male spaces, which may have been unnoticed due to her social class privilege that afforded her the opportunity to pursue further education in the UK. She mentioned the level of cohesion she experienced among the black minority group in STEM during her higher education, which is consistent with the similarity-attraction paradigm theory that suggests people tend to be attracted to those who share similar characteristics, attitudes, and backgrounds. Chinyere also spoke about her passion for research, teaching, and community engagement, particularly in mentoring young black girls aspiring to work in the STEM field. However, despite her being a course leader in STEM field, she was not promoted to become a senior lecturer, in comparison to her white colleagues who were course leaders as well as senior lecturers with the same qualifications and experience.

Prior studies have shown that ethnic minority staff are largely underrepresented in senior positions and are often employed on temporary or fixed-term contracts (Arday, 2018; Arday and Mirza, 2018; Bhopal, 2020; Bhopal and Pitkin, 2020). The lack of diversity in leadership teams is concerning, given evidence that diverse teams lead to better organisational outcomes. The under-representation of Black women in these various spheres of society has been found to have significant implications for their ability to achieve social and economic mobility.

Despite having similar qualifications and experience to their White counterparts, they are less likely to progress into leadership positions. Even with the introduction of the Race Relations Amendment Act in 1968 and the Equality Act 2010, which outlawed discrimination in the workplace, racism and sexism persists in UK higher education. Black and Minority Ethnic employees in the UK are still subjected to racial harassment, unfair treatment, income inequalities, and unequal access to training and promotion. Although policies for Equality, Diversity, and Inclusion (EDI) exist, they do not necessarily address gender and racial disparities. Kehinde , who is a mother working in the STEM field, faced unique challenges in achieving work-life balance. She often had to juggle school and work demands as well as child-care responsibilities. Achieving work-life balance is not solely the responsibility of the individual but also requires support from employers and policymakers. To create a more inclusive workplace for black mothers in the STEM field within UK higher education institutions, employers can offer more flexible working arrangements, including paid parental leave, on-site childcare and job-sharing opportunities. Policymakers can work towards

creating a more supportive and inclusive society by implementing policies that support work-life balance and reduce the gender and racial pay gap.

8.2.2 How do issues of race, gender and location shape the experiences of black women early career academics in the STEM field within UK higher education institutions.

This section examines how multifaceted factors including race, gender, and location shape black women's experiences in the STEM field within UK higher education institutions. These factors pose unique challenges and opportunities for Black women and gaining insight on the intersectional experiences of these informants could potentially provide a more equitable and inclusive academic environment by providing institutional support for black women and mentorship programs to support young black girls' aspirations in the STEM field within the UK higher education institutions.

The findings suggest that factors including race, gender and location often shape black women's experiences in STEM fields. Furthermore, this is shown in the ways that black women's competencies, abilities, and attitudes are negatively stereotyped as well as the absence of role models and mentorship programs that could potentially impact their networks and advancement within the academy. To corroborate this view, Archer *et al.* (2015), Striolo *et al.* (2021) identified that, in the policy discourses surrounding widening participation for under-represented groups in STEM education, much emphasis was made on increasing participation of young girls and women in STEM fields. However, there has been little or no mention of including ethnic minority students into the STEM education discourse let alone the intersections of race and gender namely young black girls and black women aspiring to pursue a STEM career.

Archer *et al.* (2015) argue that lower teacher expectations and racial stereotyping could potentially limit the aspirations of young black girls aspiring to pursue STEM careers such that they soon choose instead to study social science subjects including sociology and social work. For example, Chinyere grew up in a racially homogeneous society like Nigeria, which shaped her perspective on race and gender identity as well as her experiences in the STEM field within UK higher education institutions. Thus, when she moved to the UK, she could easily identify when she was treated differently based on race and gender discrimination in her workplace.

> *"What I would say is my biggest challenge is the fact that, I have always felt like I had to outperform and do more to be seen as the same as someone else that has a different race and gender identity from me, and I would say this is my own race and gender challenge"* – Chinyere

Chinyere further emphasised my main argument in this thesis that Black women face intersectional oppressions including race and gender discrimination. In addition, black women have to work twice as hard to receive the same rewards and recognition compared to their white colleagues (Jackson, 2020; Gabriel and Tate, 2017). This is shown in Chinyere 's response concerning ''*feeling the need to outperform*'' to receive the same reward and recognition that are available to her white colleagues.

Furthermore, these informants reinforced my main argument that black women have a more racialised than gendered experience in academia. Most informants mentioned that they experienced discrimination based on race rather than gender in their workplace despite the subtle presence of gendered cultures in their workplace.

"I don't feel I am treated differently based on the gender perspective,

and maybe because I don't separate that, I am a woman from the fact

that I am racialised as black and I don't necessary put a lot of thought

to the fact am a woman as much to the fact that I am black because I

see the black colleagues that I have and we tend to just be the same

too maybe because I don't see things through a gender lens'' -

Chinyere

These responses concerning the racialised experiences of black women in the STEM field within UK higher education institutions reinforce the arguments in existing literature that emphasise that lower teacher expectations and racial stereotyping about young black girls' competencies and aspirations could potentially impact the levels of representation of black women in the STEM field throughout the STEM career pipeline within the UK context. For more details about these findings (see chapter six and seven).

Yemi 's response referred to this issue as seen below:

"I mean it wasn't like overt bully like physically bullying or anything it was

more like micro aggression, talking about my hair, touching my hair,

making comments about my family or like stereotyping me so it was little

different things like this and it wasn't until year 11 that I found, that more

black people kind of moved to the area and I was actually able to feel a

bit more comfortable, but then obviously by then we had done our

GCSE season and it was time to move on" - Yemi

To corroborate this view, Chinyere mentioned:

"I spent a lot of my growing up years in Nigeria, I think that kind of

shapes, in some ways when I compare myself with my colleagues

maybe slightly how I am today… it made me to be more sensitive to

some of the things that I have experienced in the UK" - Chinyere

This quote highlights, Chinyere 'race consciousness' when she arrived the UK. This underpins Hall (2000) arguments on the dynamic and fluid nature of identity which is constantly changing across time and place. More scholarship including Morris (2014) argues that black girls lose trust in their teachers and adults in their schools due to racial discrimination because they are made to feel that no one cares about them and their academic attainment. Furthermore, these experiences hinder black women from aspiring to pursue a STEM career. The informants' responses reinforced this argument. For example, Yemi was indifferent about remaining in academia rather she wanted to pursue a clinical route. On other hand, Kehinde planned to establish and manage a research-based non-profit organisation in ten years based on her existing research skills and training acquired during her doctoral studies.

Despite the racialised and gendered experiences of these informants, there were some positive messages these informants received from their parents and community members based on their race and gender identity. These messages include stories about the informants' culture, history and the ways in which women are regarded in this context. These positive messages shaped the perspectives, motivations, and aspirations of the informants in this study. In addition, the informants' competencies and interpersonal skills were influenced by their perceived strength as Black women,

particularly in their response to critical incidents related to gender and race. The informants spoke about their experiences as Black women during their early career development and how they navigated a predominantly white and male environment. These informants believed that achieving individual success in this predominantly white and male environment requires challenging hegemonic narratives about their competencies in pursuing STEM careers. For instance, Chinyere recounted how being a woman affected her performance in STEM subjects during her secondary school and the importance of having good teachers.

> *"I think you were put up on a pedestal if you decided you were going to go the STEM route, oh whoa she is studying science…"* - Chinyere

Chinyere , like the other informants, encouraged herself that to survive STEM field, all she needed was to be smart and challenge the hegemonic narrative that STEM belongs to white men. For Chinonye who was born and grew up in London, race has relatively higher impact than gender in her early career development.

> *"I don't think my gender has, my race potentially."* - Chinonye

However, her negative experience based on race increased her resilience and motivation.

> *"Like I said before, been brought up in a Nigerian home, that spirit of excellence is embedded in you like, to always give things your best and not just come with a sub-par energy.*"- Chinonye

This was also the case with Yemi who became more resilient after a perceived discrimination based on race:

"I think that was seeing that some people were very much trying to push against me maybe want to push back. I would say that motivated me to kind of prove myself. I am going to show you that I can do it and I can do better than you think". -Yemi

This finding confirms early studies by Steele *et al.* (2004) and Brown (2008) who noted that children's perceptions of discrimination are associated with positive behavioural outcomes.

Just like Chinonye, Kehinde spoke about her early reactions to being the minority in science class during her secondary education:

"Yes, you are a girl in science class, especially when you get to SSS2 and SSS3 where the ratio of boys to girls is very high (40:15), it tells you that your type is not really supposed to be here. – Kehinde

She was taught to be confident in being one of the few girls in science class during her secondary school education. This confidence led her to be empowered to overcome any obstacles she encountered throughout secondary education and ended as top performer in her class.

"How can you beating us as guys, how can you be passing us in science class, come and show us your secret. At a point, it was like – what are you studying, what is your strategy in passing, taking 2nd position in class, or taking 1^{st}position. There was that gender thing. It played a role in studying STEM in secondary school." – Kehinde

The above quote is consistent with Brown's (2008) findings suggesting that children and adolescents' awareness of stereotyping and discrimination are based on the information these children receive from their parents concerning the existence of discrimination. Thus, these children are more likely to identify when they are being discriminated based on protected characteristics including, race, gender, class, nationality, sexuality, and religion. In the study, the Brown (2008) investigated how children develop their awareness of discrimination and what factors contribute to an attribution of discrimination. When a child experiences negative treatment, they may interpret the experience in three different ways: as an instance of non-discrimination, as an instance of discrimination that goes undetected, or as an instance of discrimination that is detected. Several factors influence a child's interpretation of a situation as discriminatory, including situational factors, individual characteristics, and certain socialising factors like parents' discussions of race (Brown, 2008).

For this study, the findings suggest that most participants faced issues of race and gender discrimination throughout their education trajectory despite the development of a positive black identity and racial group socialisations. These informants mentioned that they were treated differently from their white colleagues bore the burden of unequal workloads and feeling isolated from faculty information, research opportunities and social interactions in most accounts. Furthermore, these experiences shaped their career trajectories in STEM field within UK higher education institutions.

In addition, the findings suggest that location plays a key role in shaping black women's experiences in the STEM field within UK higher education institutions. Most

informants grew up in a non-diverse community, particularly in their home country and they found it difficult to integrate into a multi-cultural environment like the UK. Also, some migrant families moved into neighbourhoods where they stood out as minorities within a predominantly white environment. This suggests that ethnic minority individuals often face geographical, social, and economic barriers when migrating to host countries. For example, Yemi, though born in Nigeria, migrated with her family to London at the age of four years due to poor of access to quality education in her home country. While in the UK, she attended different schools for both primary and secondary education. She found it somewhat difficult to integrate in her new environment due to under-representation of ethnic minorities in her environment.

Similarly, Chinyere did not grow up in a multicultural environment. This tends to affect her identity construction, thoughts and feelings toward race and gender as well as her experiences in STEM field.

> *"Almost everybody in school looks like you, speaks the language that you speak, you don't really feel that sense of difference that I guess I began to feel here."* - Chinyere

Other informants such as Kehinde, who experienced similar incidents discussed how growing up in her community in Nigeria played a key role in shaping her perspectives and ideas of success and advancement which includes pursuing a STEM career. She also reflected on significant intergroup contact events with male colleagues in Nigeria who served as a catalyst in redefining her identity and her success desire in the STEM within UK higher education institutions. The above suggests that growing and learning in a culturally diverse location has the tendency of giving children a greater

understanding of others' beliefs, attitudes, and identities. In other words, informants who grew up in multi-cultural environments are more likely to have global awareness and feelings of inclusion as they collaborate with others from different culture and identity to further enhance their social and interpersonal skills. This is not the case with Chinyere.

> *"I spent a lot of my growing up years in Nigeria, I think that kind of shapes, in some ways when I compare myself with my colleagues maybe slightly how I am today… it made me to be more sensitive to some of the things that I have experienced in the UK"* - Chinyere

The preceding discussion highlights the importance of promoting diversity in schools, particularly in terms of race and gender.

This section highlights the importance of promoting equality, diversity and inclusion in schools and universities to promote inclusivity and eliminate discrimination based on personal prejudices. These arguments are reinforced in prior literature including Greene *et al.* (2021) and Sahal *et al.* (2018), who emphasised the significance of encouraging diversity, particularly for children with diverse backgrounds and needs. By doing so, it fosters inclusion, cultural awareness, and acceptance, and prepares children to thrive in a diverse world. According to Sahal *et al.* (2018), integrating cultural diversity into the children's educational journeys creates a better learning environment, increases the attainment of ethnic minority children, and promotes acceptance of diversity in society among children. This suggests that by growing and learning in a multicultural environment, children can develop the competencies and interpersonal skills they need for their future studies and work. Consequently, it can

be posited that learning and growing in a multicultural environment is a critical moment for the informants as it shapes their perceptions and influences their future studies and work.

8.2.3 How these black women early career academics conceptualise success and advancement in their career.

Black women often face unique challenges in the STEM field in comparison to their white colleagues (Wright, 2013; Paitek-jimenez *et al*., 2018; and Oster, 2019). Despite the increase in the numbers of black women enrolling in higher education, black women are still under-represented in STEM fields within the UK higher education and abroad. Based on this gap in the existing literature, it was a key motivation to examine how black women early career academics conceptualise success and advancement in their careers.

The interview responses suggest that black women are least concerned with traditional notions of ascending the career ladder, rather these informants were more interested in making significant contributions to their field of study, being recognised for their research and being able to make positive impact in the lives of others. These findings suggest that most informants were not merely concerned with individual success and personal accomplishments but also contributing to the broader academic community and society. The findings reflect a broader shift in academic culture towards recognising the importance of research impact beyond academia. For black women early career academics, this may also reflect a desire to address the under-representation of black women in STEM fields and to promote diversity and inclusion within academia. By valuing contributions to the field and research impact beyond

academia, institutions can create more inclusive and supportive environments for black women early career academics.

Moreover, the findings suggest that the management of higher education institutions needs to offer additional support to their diverse staff body to enable them, secure grants and tenure as well as make publications. This provides an inclusive space in which diverse perspectives and contributions will be accepted and further challenges the existing barriers within academy as well as promoting innovation. Overall, by recognising and valuing the contributions of Black women early career academics beyond traditional academic metrics, institutions can create more inclusive and supportive environments that encourage the growth and success of these under-represented groups.

Another prominent theme that emerged was the idea that success and career advancement for these informants were not limited to personal accomplishments and individual success rather to contributing to their community, mentoring, and supporting young Black girls' aspirations in the STEM field within UK higher education institutions. Yemi , one of the informants, cited the under-representation of black women in her field of study, clinical psychology, as one of her motivations for pursuing a PhD. She also expressed a desire to share knowledge with others and learn more about different disorders. Other informants also expressed their willingness to mentor and support other black women in their career trajectory, demonstrating the concept of "lift as you climb".

Black women developed a sense of community with each other, and this is deeply rooted in the history of discrimination and oppression they experienced. This sense of

belonging to a community is often used to empower black women and provide support and opportunities for success and advancement in their careers. In addition, it is important to highlight the presence of intersectionality in academia, to gain insight on the experiences of under-represented groups within the feminist discourse and the need for a more collaborative and inclusive environment that support black women's career advancement. Furthermore, this emphasis on community and collaboration challenges the dominant individualistic and competitive culture that often prevails in academia.

The findings suggest that, by recognising and valuing the contributions of others in creating an inclusive and diverse academic environment, this reinforced the notion that success is a collective effort useful for all members of society rather than an individual pursuit. These findings suggest that the informants viewed success as a collective effort to benefit others in their community rather than an individual pursuit. Furthermore, the findings highlight the need for a more collaborative and supportive approach to career advancement that explores issues concerning intersectionality, equality, diversity, inclusion, and social justice.

Another key theme for the success and career advancement of black women early career academics is the idea of authenticity and bringing their 'best foot forward' in their academic pursuit. The informants reported feeling pressure to conform to mainstream cultural norms in a predominantly white society which led to feelings of disconnection and disempowerment. Chinonye, for instance, enjoyed teaching in higher education, but she felt work pressures in the STEM field within UK higher education institutions that hindered her from maintaining work-life balance. Similarly,

participant A lamented about the long hours required in STEM fields as well as the challenges of balancing work and childcare responsibilities. She often highlighted the under-representation of black women in STEM and recommended that black women create a pathway for themselves. Yemi acknowledged feeling pressure from her community to address the under-representation of black women in STEM, but recognised the barriers black female academics face within the academy. Wemimo shared the reality of being a PhD student at a predominantly white institution with few black colleagues. Despite these challenges, the informants emphasised the importance of remaining authentic and participating in counter storytelling to challenge the hegemonic narratives of their ethnic group in the predominantly white society.

In most of the informants' responses, the desire to challenge the status quo and break down barriers to create a more inclusive academic environment in which black women and other women of colour can survive and thrive within the UK higher education institutions was identified. This includes challenging discriminatory practices and policies in academia while advocating for more inclusive policies, supporting, and mentoring young black girls aspiring to pursue a STEM career. Thus, these informants emphasised the importance of mentorship and networking to advance their careers. This allows these informants to gain access to information, resources and opportunities that may not be previously available to them. Mentorship and networking can also provide emotional support and guidance, which is particularly important given the unique challenges that the target population face. It was also found that the informants were aware of the opportunities and participated in various activities outside of their academic work to improve their skills and network with other black

women. Chinonye was the most active participant who participated in various career growth programs, including the Continuous Professional Academic Development, diversifying leadership, and Aurora Leadership Development Program. Wemimo and Victoria also participated in such programs, including the BAME early careers conference. Finally, for some of the Informants (Chinyere in particular), success and advancement in their career's means being able to secure leadership, tenure, or a permanent academic position. This is often seen as a significant milestone in academia and can provide more stability and opportunities for further advancement.

In summary, Black women early career academics in STEM fields have diverse conceptualisations of success and career advancement, which reflect their complex experiences and challenges. Some of the ways they view success include making significant contributions to their field of study, building supportive networks, challenging the status quo, breaking down structural inequalities and institutional barriers, and achieving tenure or a permanent academic position. These different perceptions of success are shaped by their experiences of gender, race, and location. Although the women face numerous challenges such as isolation, unconscious bias, and lack of support, many remain committed to advancing their careers and making a difference in their fields. To overcome these challenges, they use various strategies such as resilience, creating peer networks, demonstrating their abilities, remembering their passion for science, and engaging in activism to support other minorities. Despite facing discrimination, these women have shown remarkable strength, perseverance and created new pathways to support young Black girls' aspirations. Therefore, this

study, while acknowledging the presence of gender and racial bias, also documented lessons to be learned from these women's stories of success and survival.

8.3 Conclusion

In conclusion, this chapter has explored the experiences of black women early career academics in STEM fields. Drawing on the theoretical framework including CRT, decolonial thought, coloniality of gender, racial neoliberalism and Bourdieu capital theory, this study highlights how the informants were 'ideal neo-liberal subjects' whose motivation and aspirations were shaped by colonial legacies of capitalism and neoliberalism. However, the informants 'neo-liberal' aspirations were negated by structural inequalities and systemic racism within UK higher education institutions. These informants faced unique challenges based on the intersections of their race and gender identity. The findings underpin the arguments within Kundnani (2021) racial neo-liberalism theory, in which resources, wealth and opportunities are distributed based of colonial legacy of racial hierarchy that enforces global inequality, longstanding effects of racism within western institutions. Thus, this chapter 'locates' the informant's life stories with the broader social, political and historical context based on Goodson and Sikes (2001) genealogy of the context approach. These insights are valuable for policymakers, institutions, and academics seeking to promote diversity, equity, and inclusion in STEM fields. By understanding the challenges that black women face in the academic environment, and by taking steps to address these challenges, we can work towards creating a more inclusive and equitable environment for skilled professionals regardless of their backgrounds. Overall, by supporting black

women early career academics, they can achieve their full potential and make more contributions to the STEM fields.

<center>**Chapter Nine**</center>

<center>**Conclusion and Recommendations**</center>

9.1 Introduction

This concluding chapter summarises the main findings, significance of these findings, limitations of the study and provides recommendations for students, staff, university management and policy makers to promote and ensure the implementation of equality, diversity, and inclusion within the academy. Recommendations for future research in areas that were not covered in this thesis due to time constraints. Based on the informant's life stories, this thesis highlights the ways in which UK higher education is implicated by race, gender and neoliberal discourses. It identifies the need for UK university management to reflect on the racialised and gendered fundamental structures and systems that marginalises black women and other ethnic minority students and academics within higher education institutions. Furthermore, to change the existing structures and systems to reflect the changing demographic of students and academic staff in the STEM field within UK higher education institutions.

9.2 Summary of Findings

This study focused on exploring the experiences of black women early career academics in the STEM field within UK higher education institutions, how issues including race, gender and location shape the informants' experiences and how these informants conceptualise success and advancement in their careers. Prior literature has scarcely addressed the intersections of race and gender disparity in the STEM field within the UK higher education institutions.

Moreover, the existing literature on this field has focused on the attainment gap between BME students and white students, the experiences of black female professors and BME senior academics in the UK. Furthermore, there has been more focus on widening participation for girls in STEM field but little or no mention of supporting the aspirations of ethnic minority students aspiring to pursue a STEM career let alone exploring intersectional issues including those that impacts the participation of black women in STEM fields. Thus, this study highlights the experiences of black women early career academics and provides insights for creating more equitable and inclusive work environments.

To examine these study objectives, a combination of CRT and life history method focused on producing counter-narratives used to highlight the voices of marginalised groups namely black women and challenge the hegemonic narratives and oppressive mechanisms that shape black women's experiences within the academy.

The position in this study is based on an interpretivist philosophy used in most qualitative studies to examines the subjective experiences of the informants. This created a research process that further provided in depth insight on the subjective experiences of the informants (Cohen *et al.*, 2011). The issue of 'bias' and personal views could influence the presentation of findings in this thesis (Becker, 1967). To eliminate the issue of 'bias', an autobiography (see chapter one) was included. To allow the reader to understand how personal identity, experiences, assumptions, biases, and subjectivities impacted the representation of findings in this study.

The participation of six black women in the early stages of their academic careers were included to for this study. This group consisted of three PhD candidates, two postdoctoral researchers, and one lecturer. The informants were between the ages of 25 and 35 and were enrolled in STEM PhD programs such as medicine, biosciences, microbiology, neuroscience, and clinical psychology. This study did not include the participation of Black Caribbean/ British women due to limited access to this population.

9.2.1 Experiences of Black women early career academics in STEM field within UK higher education institutions

Findings suggest that Black women early career academics face multifaceted and complex factors including race, gender and location that shape their education and career trajectories in STEM fields. Consequently, Black women face marginalisation, exclusion and inadequate access to information, resources and opportunities that are arbitrarily available to their white colleagues. The under-representation of Black women in the STEM field could potentially lead to the absence of role models, support from mentors, isolation, imposter syndrome and generally a lack of support from university management. Thus, it is important for university management to provide institutional support including mentoring programs and networks to support black women academics in the STEM field as well as young black girls aspirations to pursue a STEM career.

Furthermore, the findings suggest that informants could not recall instances of discrimination based on race and gender in their schooling in the UK, despite the presence of gendered working cultures in their narrative accounts. It can be posited

that informants may have normalised these experiences and were unable to identify when they are being treated differently based on their race and gender identity. It was also found that black women experience negative stereotyping and micro-aggressions which can impact their career progression. Thus, Black women often navigate these challenges as well as negotiate their visibility and voices to be heard in the workplace. In addition, Black women face the absence of role models and mentors, which impacts their career advancement and professional networks.

9.2.2 How do issues of race, gender and location shape the experiences of black women early career academics.

The findings provide evidence that black women face intersecting issues including race, gender and location that shapes their subjectivities within UK higher education institutions. With regards to race and gender discrimination, informants were often negatively stereotyped about their abilities and competencies based on their race and gender identity. Most informants reported various instances where they faced discrimination based on their race rather than their gender identity. These informants face negative stereotypes and biases that assume that they are less competent, more aggressive and less deserving of their positions than their white colleagues. In addition, it was that, the negative experiences the informants faced regarding race and gender identity had both positive and negative impacts. On the one hand, informants' negative experiences based on race and gender discrimination has led most informants to consider a career outside the STEM field. On the other hand, these experiences have motivated the informants to challenge the status quo and hegemonic narrative of black women's competency in the STEM field. These

informants chose a STEM career because of the under-representation of black women in the STEM field. These informants displayed strength and perseverance in their pursuit of a STEM career and this attitude was formed in their childhood based on the positive messages they received about their gender and racial identity and the value placed on them by their families and communities. Furthermore, this shaped their perceptions and enabled them to function properly in a predominantly white and male environment.

The findings suggest that geographical location in addition to race and gender shapes the experiences of the informants in this study. The informants who grew up in less diverse communities, particularly in their home country, found it challenging to integrate into a multi-cultural society, because they became the minorities in their new environment. In addition, ethnic minority individuals are more likely to face geographical and socio-economic challenges in adapting to their new environment. However, the informants who grew up in culturally diverse environments felt more competent in understanding others' beliefs, behaviours, and attitudes. The informants mentioned that, their exposure to multicultural schools enhanced their interpersonal skills as adults.

9.2.3 How do these black women early career academics conceptualise success and advancement in their careers.

The findings suggest how neoliberal discourses shaped the motivations and aspirations of the black women early career academics in the STEM field within UK higher education institutions. These neoliberal discourses move beyond the traditional metrics of academic success including publishing and funding.These informants prefer

to make useful contributions to their field of study, be recognised for their research and make positive impact in their communities. Furthermore, this fundamental shift in academic culture reflects a broader recognition of the importance of research impact beyond academia. For Black women early career academics, it also reflects a desire to address the under-representation of black women in the STEM field and promote diversity and inclusion within academia. When institutions place value on the contributions of Black women in the STEM field, the research impact moves beyond academia. In addition, institutions are creating a more inclusive and supportive environment for skilled professionals to make useful contributions regardless of their backgrounds. These informants valued work-life balance and self-care, as well as professional development opportunities and recognition from their colleagues and institutions. In addition, these informants recognise the importance of advocating for each other as well as other marginalised groups, and actively seek out opportunities to make their voices heard.

9.3 Significance of this study

Prior literature has scarcely addressed the intersections of race and gender disparity in STEM fields. This study highlights the experiences of Black women early career academics in STEM fields, within UK higher education institutions and the system, which remains an under-researched area in the existing literature.

This study highlights the "success stories" as well as the challenges black women early career academics face in navigating systemic racism and institutional barriers in the STEM field. Drawing on the principles of CRT, this study takes an intersectional approach to examine how multifaceted factors including race, gender and location

shapes the education and career trajectories of black women early career academics. In addition, this study is focused on counter storytelling and counter narratives produced by Black women in this study, to challenge the hegemonic narratives of meritocracy, objectivity, and neutrality of the UK higher education institutions. Furthermore, black women voices are highlighted in this study drawing on the conceptual tools of CRT and life history. With the use of life history method, a 'genealogy of the context' is being produced in which the present experiences of the informants are traced back to broader social, cultural, economic, and historical context in which these experiences occurred (Goodson and Sikes, 2001).

The findings could potentially inform policy-making addressing intersectional inequalities based on race, gender and social class. This thesis recommends targeted policies and practices that encourage the participation of black women in the STEM field within UK higher education institutions. Also, it important to develop mentorship programs to support young black girls' aspirations in the STEM fields and networking programs to enhance black women career progression within UK higher education institutions. In addition, this study contributes to the body of scholarship in anti-racism work in higher education that has emphasised the importance of taking policy driven actions to increase the representation of BME academics to senior positions within academia (Bhopal and Pitkin, 2020). To avoid losing skilled professionals to overseas higher education institutions due to the unfavourable conditions in which BME academics face in the career pursuit (Bhopal, 2018). Overall, this study advocates for increase equality, diversity, inclusion, and social justice policies within the academy to

ensure that skilled professionals regardless of their background make significant contributions to their field of study.

9.4 The Implications for the Study

The findings have significant implication for policy making to increase the representation of black women in STEM fields. This study drew on relevant theories including CRT, decolonial thought, coloniality of gender, racial neoliberalism and Bourdieu theory of capitals.

By incorporating CRT, I highlighted how racism in a social construct deeply embedded in western institutional structures and practices. For this study, CRT uncovers how systemic racism and institutional barriers shape the education and career trajectories of black women early career academics in the STEM field within UK higher education institutions. By incorporating decolonial thought and coloniality of gender, this study highlights how 'coloniality' a long-standing effect of 'colonialism' shapes the informant's motivations, aspirations, experiences, identities and subjectivities in the STEM field within UK higher education institutions. By incorporating Racial neoliberalism and Bourdieu cultural capital theory, I uncover how social class shapes the informant's experiences as they continue to reproduce the values of the elite class. For this study, this theoretical foundation uncovers how African parents position their children in British schools to secure their elite status because these children would accrue capital similar to that of the white British elite class. However, the informant's neo-liberal ideals and aspirations are often negated by systemic racism within UK higher education institutions. Thus, these informants who embody neoliberal ideals

have an intersectional experience within Higher education suggesting the unique challenges black women face within UK higher education institutions.

The reason for combining these theoretical frameworks is to provide an in-depth analysis of black women early career academics experiences in the STEM field within UK higher education institutions. This study highlights the unique challenges black women face within higher education based on their intersectional identity including race, gender and social class membership. Furthermore, these findings highlight the ways in which UK higher education institutions have been implicated by race, gender and neoliberal discourses and how this shapes informant's life stories as they participate in the STEM field within UK higher education institutions. This study advocates for policy driven actions to be implemented within higher education institutions to ensure equality, diversity, inclusion, and social justice in academia.

9.5 Limitations of the study

It is important to note the limitations of this study. The findings in this qualitative study cannot be generalised. One limitation encountered in this study, two out five informants withdrew from this study for the fear of professional exposure. This could potentially impact their early career journeys as they were unsure about the levels of anonymity in this study. However, I used pseudonyms (fake names) to ensure the anonymity and confidentiality of the study informants' identities.

Another limitation is the use of life history influenced approach, in which the informants have to recollect past experiences which are subject to memory biases. Informants may encounter difficulties in recollecting past events. Due to time and resource constraints, life history interviews could be time consuming, tedious and resource

intensive. However, this approach provides in depth understanding about an issue. In addition, life history interviews are usually conducted with a sample population. This allows the researcher to conduct several interviews to unpack emerging themes within the data collected. Another limitation is that, the findings highlights the unique experiences of the six informants. These findings do not apply to other non-white women and ethnic groups. Thus, the range of experiences are limited.

9.6 Recommendations for future research

This study highlights the experiences of Black women early career academics in the STEM field within UK higher education institutions. The main findings are not representative of the experiences of all black women in STEM fields, and it cannot be generalised to other faculties and countries, rather this study illustrates the unique experiences of a few black women as a contribution to wider discussions on the theme.

In this study, the issue of power and representation plays a key role in how the informants' accounts are represented in this thesis. Although the study made an effort to eliminate bias through autobiographical accounts, individual subjectivities and perspectives, this self-reported data cannot be completely devoid of bias (Becker, 1967). In addition, life history methods have been criticised based on issues of epistemology, considering that informants may provide an inaccurate representation of themselves in their narrative accounts that can further distort the data collected. However, life history method was the most suitable for this study, as it provided an in-depth insight into the experiences of black women early career academics in STEM fields.

Moreover, this study did not examine the perspectives of other stakeholders including faculty heads, university management and colleagues who are demographically different from the informants to provide additional insight to the experiences of black women early career academics. Due to time constraints, this study did not explore other intersectional identities of black women based on sexuality, class, religion, and disability.

In view of the above, the following areas are suggested for further study:

1. To explore the experiences of black women early career academics based on other intersectional identities including social class, sexuality, and disability in relation to pursuing a STEM career.

2. A comparative study of the experiences of Black women early career academics across different academic disciplines.

3. A comparative study on the experiences of Black women early career academics in STEM fields in both the UK and USA context.

4. A qualitative study of stakeholders' experiences in supporting black women early career academics.

9.7 Recommendations for key stakeholders

Based on the study findings, the following recommendations are suggested:

a) **Increase representation**: Efforts should be made to increase the representation of black women in STEM fields, both in terms of recruitment and retention. This can be achieved by:

    i.   Strengthening as well as scaling up existing targeted mentoring and

coaching programmes across Higher Education in the country. This means UK higher education institutions could implement mentoring and coaching programs that are specifically tailored to the needs of black women early career academics in STEM. These programs could provide opportunities for black women to connect with experienced mentors who have navigated similar challenges and can provide guidance and support. Mentoring and coaching can also help to build confidence, develop skills, and establish networks that can be crucial for career advancement.

ii. Expand funding and scholarships: UK higher education institutions could expand funding and scholarships to support the recruitment and retention of black women in STEM. These scholarships could be targeted towards black women early career academics, who are pursuing research in under-represented areas of STEM or who have overcome significant barriers to access education. Such funding can help to reduce financial barriers and create opportunities for black women to pursue careers in STEM.

iii. Strengthening the implementation of current inclusive policies and practices

b) **Address intersectionality**: The intersectional experiences of Black women early career academics in STEM fields should be addressed by acknowledging the ways in which race, gender, and location shape their education and career

trajectories.

c) **Support networks**: Institutions should provide more support networks for black women early career academics in STEM fields, such as mentoring programs, professional development opportunities, and networking events.

d) **Address discrimination**: Institutions should take proactive steps to address discrimination and bias against black women early career academics in STEM fields, such as implementing anti-discrimination policies, training staff on unconscious bias, and promoting diversity and inclusion.

e) **Rethink measures of success**: Institutions should re-evaluate how they define and measure success and advancement in STEM fields and ensure that they are inclusive and consider the unique experiences of black women early career academics.

f) **Research Funding**: Funding bodies should prioritise research on the experiences of black women early career academics in STEM fields, to better understand their experiences and identify ways to support them.

9.8 Conclusion

In conclusion, this study highlights the experiences of black women early career academics in STEM fields, and how issues of race, gender, and location shape these experiences. The study has highlighted the challenges that Black women face, including inadequate representation and support, racial and gender biases, and the struggle to achieve work-life balance. In addition, the study has explored how these women conceptualise success and advancement in their careers. This study

contributes to the broader discourse on equality, diversity, inclusion, and social justice in academia. By highlighting the unique challenges faced by black women early career academics in STEM fields, this study has opened avenues for further research, policy development, and institutional change. This study highlights the ways in which the informants' responses were analysed through the theoretical lens of CRT, decolonial thought, black feminist thought and Bourdieu's cultural capital to uncover the interplay between race, structure, and agency in relation to the study aims. The findings highlight the importance of addressing race and gender disparity that impacts black women's career advancement in the STEM field within UK higher education. It is important to note that diversity in STEM field will produce innovation and better science used in the production of goods and services useful to society as well as increase the economic growth of a nation.

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Appendices

Participant Information sheet

Exploring the life histories of black women early career academics in the Science Technology Engineering Mathematics (STEM) within the UK higher education institutions.

Participant information sheet

Introduction

My name is Peace Akuwudike, an MPhil student at St Mary's University Twickenham, London. I invite you to participate in a research study on 'Exploring the life histories of black women early career academics in the Science Technology Engineering Mathematics (STEM) field within the UK higher education institutions'. According to the (Guardian newspaper, 2020), 'there are less than 2% of Black women scientists in the UK higher education sector. Prior literature has attributed the shortages of Black women in this field to lower teacher expectations and racial stereotyping that excludes young Black girls from studying science subjects in secondary school. Thus, this study examines the experiences

of Black women working in the UK STEM field, to ascertain how their experiences are shaped by race, gender, and location.

Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is unclear or if you want more information. Take time to decide whether to participate.

This study has undergone an ethics review in accordance with the St. Mary's University Research Ethics Committee.

- You have been invited to participate because you are a Black woman early career academic working in the STEM field who has completed their Ph.D. within the last 10 years and is aged (25-50) years.

- Participation is completely voluntary, and you have the right to refuse participation, refuse any question, and withdraw at any time without any consequence whatsoever.

Purpose of study

- This study will examine the extent to which race, gender and location shapes the experiences of Black women early career academics in the STEM field within the UK higher education sector.

- This study is important because exploring the experiences of black women in STEM can provide support including mentoring programs for young black girls' future aspirations and the development in this field.

- Data gathered from this study will be included into future publications including my thesis and journal articles.

Descriptions of the study procedures

- I am interested in hearing about your life history and your career. If you agree to participate in this study, you will be asked to complete a biographical questionnaire that covers who you are, what you do, where you are from and how you grew up. `You will be asked to participate in two subsequent interviews at a mutually convenient date/ time. These interviews will be audio recorded and ask you about your personal background and professional experience in the STEM field within the UK higher education institutions. Each interview will last a maximum of 2 hours. Interviews will be held online via Zoom or in person depending on public health conditions and/or your preference. Also, I will send you the transcripts of the interview to verify the contents match your responses before inclusion into the thesis.

Risks involved in this study.

- This is a low-risk study as you are only required to talk about how you grew up in the UK and your professional experience. However, the only issue involved is that you may have to recollect bad experiences or sad stories in relation to your experiences in obtaining secure employment and promotions in the STEM field within the UK higher education sector. However, as with any type of biographical research reflecting on your personal and professional lives may bring mixed emotions. You are free to choose not to answer questions and avoid sensitive topics.

Confidentiality

Data collected in this study will be kept as confidential as possible. Only I and my supervisors will have access to the files. Anonymity will be assured in this study; I will use pseudonyms to protect the identity of the respondent and their institutions throughout the research. You and your respective institutions will not be identified in any reports or publications. All digital files, transcripts and summaries will be given codes and stored

separately from any names or other direct identification of participants. Interviews will be recorded and stored on a secure St Mary's University server for a period of ten years.

What happens with the results of this study?

The transcripts will be included in the MPhil thesis and in future publications

Further information

If you have any questions regarding this study, please contact the researcher: at 701670@live.stmarys.ac.uk

Many thanks for reading this information sheet.

Contact details of supervisors

Dr Fiona Cullen, Senior Lecturer in Education Studies. St. Marys University, Twickenham. Telephone: 020 8240 4000 (2385). Email address: fiona.cullen@stmarys.ac.uk

Dr Paul Tarpey, Senior Lecturer in Education Studies. St Marys University, Twickenham. Telephone: 020 8240 4125. Email address: paul.tarpey@stmarys.ac.uk

Consent form

Exploring the life histories of black women's early career academics in the STEM field within the UK higher education institutions.

Name of Participant: _____

Title of the project: Exploring the life histories of black women early career academics in the STEM field within the UK higher education institutions.

Main investigator and contact details: Peace Akuwudike, 701670@live.stmarys.ac.uk

Members of the research team: Peace Akuwudike.

1.   I agree to take part in the above research. I have read the Participant Information Sheet whichis attached to this form. I understand what my role will be in this research, and all my questionshave been answered to my satisfaction.

2.   I understand that I am free to withdraw from the research at any time, for any reason,

and   without prejudice.

3.   I have been informed that the confidentiality of the information I provide will be

safeguarded.

4.   I am free to ask any questions at any time before and during the study.

5.   I have been provided with a copy of this form and the Participant Information Sheet.

Data Protection: I agree to the University processing personal data which I have supplied. I

agree to the processing of such data for any purposes connected with the Research Project

as outlined to me.

Name of participant

(print)…………………………………………………………………..

Signed………………..…………………

Date………………………..........

-

If you wish to withdraw from the research, please complete the form below and return to the main investigator named above.

Title of Project:

_____

I WISH TO WITHDRAW FROM THIS STUDY

Name: _____

Signed: _____   Date: _____

Biographical questionnaire

biographical detail form

Personal details

a) What is your name? _____

b) Which age group do you belong to? ☐(25-35) ☐(36-40) ☐(41-45) ☐(46-50)

c) Where were you born? _____

Education

d) Primary school attended? _____ Dates _____

e) Secondary school attended? _____

What are the dates you attended this school? _____

f) University/College attended?   _____Dates _____

g) What course did you study?   _____

h) Please, List out your qualifications? _____

_____

_____

_____

_____

i) What was your experience studying science in primary, secondary, and higher education?

_____

_____

_____

_____

_____

Employment

j) Where do you work? _____

k) Which position do you hold at this higher education institution? _____

l) Career progression- can you summarize your career trajectory? _____

_____

_____

_____

_____

_____

_____

Round one interview guide

Appendix B: Interview Guide

> **Exploring the life histories of black women early career academics in the STEM field within the UK higher education institutions.**

Research Questions:

i. What are the experiences of black women early career academics in the STEM field within the UK higher education institutions?

ii. How do issues of gender, race and location shape the experiences of black women early career academics in the STEM field within the UK higher education institutions?

iii. How do these black women early career academics conceptualize success and advancement in their career?

Interview Questions:

A. Background & early education

1. Tell me about your upbringing as a child?

2. What was it like for you growing up as a black girl/woman in your community?

3. How would you describe your cultural and class background to someone who is unfamiliar?

4. How were STEM subjects discussed in your household with parents and siblings? Were there any expectations that you might pursue a career in this field?

5. Tell me about your educational journey from childhood to your secondary school years? Which subjects did you like the most and the least while growing up? Why?

6. Who has most influenced your academic path and why?

7. How was STEM subjects including science, mathematics, biology, physics, engineering and so on, talked about within the community that you grew up in?

8. What were your experiences studying STEM subjects (e.g. general science, mathematics, biology, physics, etc) at secondary school? What were they like – abstract, theoretical, experimental?), How did you rate your performance in STEM subjects? What did you believe contributed most to your performance? Has your race or gender played a role in your overall performance in STEM subjects at secondary school?

B. Higher education and training

1. Tell me about your "STEM" specialization and how you came to that option? - What motivated you to pursue a bachelors, master's degree and PhD in this field? How did you decide on your institution of study?

2. Tell me about your university experiences (the teaching, subject, expectations, motivations, interactions?)

3. Can you share with me any specific experiences (it may be positive or negative experiences) you encountered in your university years where your gender andrace played a role?

4. How did you manage those experiences?

C. Employment and progression

1. What do you enjoy most about your job in the UK STEM field? (Teaching, research products, community engagement) and why? Have you been recognized for these, if yes, how?

2. How do you feel about working in the STEM field within the UK higher education institutions? Are there any pressures you feel while working in the STEM field and from whom?

3. How would you describe the work environment (recognition/positive reception, gender inclusiveness, collaboration) in the STEM field? What are your thoughts on the role of social and cultural norms in your work environment?

4. What are your professional aspirations? Where do see yourself in 10 years? What are your plans to achieve these aspirations? What challenges do you anticipate? Do you think these challenges will be different for your other colleagues who are demographically different (gender, and race)? If yes, why?

5. How would you describe your working relationship with colleagues? Are there instances where your gender or race played a role in your relationship (whether positive or negative)?

6. As an academic **working in the STEM field,** what are the challenges you have faced or facing? Are the challenges **gendered/raced or** peculiar to **early career staff?**

7. What programs or policies are put in place by the university to improve conditionsof service for early career academics in the STEM field? Are they gendered/raced?

8. What is your opinion about the policies/practices relating to promotion in the STEM field: do you think they are fair enough? Are academics rewarded differently based on certain demographic consideration?

9. What changes would you like to see in the STEM field?

D. Barriers and opportunities

1. As a black woman, are there constraints or opportunities in the STEM fieldthat may be specific to you or people of your background? Please list and explain.

2. Are there opportunities for professional development for early career academics in the STEM field? Are the opportunities gendered or raced?

3. What are your thoughts on critical success factors for career advancement in the STEM field as a black woman?

4. What changes would you want to see soon in the STEM field within the UK higher education institutions?

Round two interview guide

Kehinde 's follow up interview questions.

Kehinde Kehinde family's influence on her career

A. Can we return to your family and how they influenced your aspirations? Can you tell me more about that?

B. Which family member were most influential? (In what ways?).

C. Were they similarly influential with your siblings (other sisters?) Can you tell me in what ways?

D. In our previous interview, you mentioned "that your parents were very open-minded about STEM subjects such as Doctor, And Engineer. 'How do you think that shaped your future career into medicine?'.

E. Are there any STEM subjects or careers they might have been less keen on? Can you say more about that?

F. You also mentioned some challenges you faced from family members about realising your ambition to become a doctor. Can you reflect further on how you responded to these? What kept you on track?

Kehinde Kehinde motherhood and career

G. Moving onto talking about your experience as a working mother- What challenges do you think you faced as a black mother in STEM field?

H. What support is there for black mothers in developing an academic career?

I. What challenges do you think black female academics and mothers in general face

in combining a career and family?

J. Could you tell me more about the institutional support available at your institution to support academics who are mothers?

K. Can we move to talk about your experience within the workplace? Can you tell me about the aspects of your work including teaching and research that is prioritised by you? Or by the institution?

L. Can you tell me more about the academic structure in your workplace? Who tends to take roles (In leadership? In research? In teaching?).

M. In our last interview, you mentioned that, you have limited opportunities to teach-is this still the case?

N. What kinds of teaching would you like to be involved in? what would teaching offer you?

O. How do you feel about the limited opportunities to teach?

P. Who does the bulk of teaching in your department? Why might this be the case?

Kehinde Kehinde views on opportunities and barriers for black women

a. Let's return to your previous discussion about opportunities and barriers. You previously mentioned that there are barriers particularly for black academics in the STEM field? Can you tell me a little more about this?

b. How does this affect your career progression?

c. What kind of measures are taken to address these issues? Could you talk about the measures taken by your institution? Then in the STEM field generally?

d. How have these measures related to address race inequalities? Gender inequalities?

e. Given that you have been working at the university, what are thoughts on the levels

of inclusion and exclusion in your institution?

f. What else do you think needs further action?

g. Is there anything else you would like to add that has not been covered in these interviews?

Chinyere 's follow up interview questions.

A. In our last interview, you mentioned that you had more of Personal or individual recognition (positive feedback from colleagues/students, collaboration, etc.) than institutional or organizational recognition. Are there ways in which academics are rewarded differently, in yourexperience?

B. You used the term "protected group" and you noted those included in these groups appeared to be treated differently by the management of the university. Could you tell me more about this issue?Could you tell me more about this issue? (Can you provide any examples).

   a. Could you tell me more about what you have noticed about who is represented in key roles in the faculty? Who tends to be in leadership roles? Have noticed anything about patterns of promotion? Are the ways that leadership and promotion could be more inclusive? (To which groups? Black women specifically?).

C. Turning to talk about inclusion more generally- What are your views on(EDI) Equality, Diversity and Inclusion, and otherinclusion policies? What kind of staff action around inclusion and other equity-related issues at your institution and more widely?

D. From the time you started working in the UK STEM field, what shifts have you noticed to improve inclusion amongst academic staff in particular?

E. What kind of measures are taken to address these issues? Could you talk about the measures taken by your institutions? then in the STEM field generally? Which do you think are helpful and in what ways? How have these measures related to addressing race inequalities? Gender inequalities?

F.   What barriers do you see to improving inclusion?(Particularly for women and then black women in STEM).

G. What ideas do you have to shift some of the issues you have talked about above?

H. What could the stakeholders in your institution do differently to improve the STEM field?

I. What sources of support can you identify? - You mentioned a formal network called TRIVE. Which other formal networks are you part of? Institutional, discipline-related, national, or international? What informal networks would you consider yourself part of? What do these networks do and how do they help? In what ways do you participate?

J. Is there anything else you would like to add which has not been covered in these responses?

Ethics form

St Mary's University

Ethics Sub-Committee

Application for Ethical Approval (Research)

This form must be completed by any undergraduate or postgraduate student, or member of staff at St Mary's University, who is undertaking research involving contact with, or observation of, human participants.

Undergraduate and postgraduate students should have the form reviewed and signed by their supervisor and forwarded to the Faculty Ethics Sub-Committee representative. PhD/MPhil applications must also be reviewed and signed by an Ethics Representative. Staff applications should be forwarded directly to the Faculty Ethics Sub-Committee representative. All supporting documents should be merged into one document (in order of the checklist) and named in the following format: '**Full Name – Faculty – Supervisor'**

Please note that for all undergraduate and taught masters research projects the supervisor is the Principal Investigator for the study.

If the proposal has been submitted for approval to an external, properly constituted ethics committee (e.g. NHS Ethics), then please submit a copy of the application and approval letter to the

Secretary of the Ethics Sub-Committee. Please note that you will also be required to complete the St Mary's Application for Ethical Approval.

Before completing this form:

- Please refer to the **University's Ethical Guidelines**. As the researcher/ supervisor, you are responsible for exercising appropriate professional judgment in this review.

- Please refer to the Ethical Application System (Three Tiers) information sheet.

- Please refer to the Frequently Asked Questions (FAQs) and Commonly Made Mistakes sheet.

- If you are conducting research with children or young people, please ensure that you read the **Guidelines for Conducting Research with Children or Young People**, and answer the below questions with reference to the guidelines.

Please note:

In line with University Academic Regulations the signed completed Ethics Form must be included as an appendix to the final research project.

If you have any queries when completing this document, please consult your supervisor (for students) or Faculty Ethics Sub-Committee representative (for staff).

St Mary's
University
Twickenham
London

St Mary's Ethics Application Checklist

The checklist below will help you to ensure that all the supporting documents are submitted with your ethics application form. The supporting documents are necessary for the Ethics Sub-Committee to be able to review and approve your application. Please note, if the appropriate documents are not submitted with the application form then the application will be returned directly to the applicant and may need to be re-submitted at a later date.

Document	Enclosed?*	Version No
1. Application Form	Mandatory	
2. Participant Invitation Letter	☒Yes ☐No ☐Not applicable	
3. Participant Information Sheet(s)	Mandatory	
4. Chinyere onsent Form(s)	Mandatory	
5. Parental Consent Form	☐Yes ☐No ☒Not applicable	
6. Participant Recruitment Material - e.g. copies of posters, newspaper adverts, emails	☒Yes ☐No ☐Not applicable	

7. Letter from host organisation (granting permission to conduct study on the premises)	☐Yes ☐No ☒Not applicable	
8. Research instrument, e.g. validated questionnaire, survey, interview schedule	☒Yes ☐No ☐Not applicable	
9. DBS certificateavailable (original to be presented separately from this application)*	☐Yes ☐ No ☒Not applicable	
10. Other Research Ethics Committee application (e.g. NHS REC form)	☐Yes ☐ No ☒Not applicable	
11. Certificates of training (required if storing human tissue)	☐Yes ☐ No ☒Not applicable	

I can confirm that all relevant documents are included in order of the list and in one document (any DBS check to be sent separately) named in the following format:

'Full Name - Faculty – Supervisor'

Signature of Proposer:	~~(signature)~~	Date:	13/9/21
Signature of Supervisor	Fj Cullen/ P. Tarpey	Date:	13/9/21

(for student research projects):			

St Mary's University Twickenham London

Ethics Application Form

1. Name of proposer(s)	Peace C. Akuwudike
2. St Mary's email address	701670@live.stmarys.ac.uk
3. Name of supervisor	Dr Fiona Cullen and Dr Paul Tarpey
4. Title of project	Exploring the life histories of black women early career academics in STEM field within the UK higher education sector.
5. Faculty or Service	☐Business, Law & Society ☐Institute of Education ☐ SAHPS☐Theology & Liberal Arts
6. Programme	☐UG ☐ PG (taught) ☒PG (research) Name of programme: MPhil Education

☐ Staff ☐ UG student ☒ <mark>PG student</mark>

7. Type of activity

☐ Visiting ☐ Associate

8. Confidentiality

Will all information remain confidential in line with
the Data Protection Act 2018?

☒Yes ☐No

9. Consent

Will written informed consent be obtained from all
participants/participants' representatives?

☒Yes ☐No

☐Not applicable

10. Pre-approved Protocol

Has the protocol been approved by the Ethics Sub-
Committee under a generic application?

☐Yes ☒No

☐Not applicable

Date of approval:

11. Approval from another Ethics Committee

a) Will the research require approval by an ethics
committee external to St Mary's University?

☐Yes ☒ No

b) Are you working with persons under 18 years of
age or vulnerable adults?

☐Yes ☒ No

12. Identifiable risks

a) Is there significant potential for physical or psychological discomfort, harm, stress or burden to participants?   ☐ Yes   ☒ No

b) Are participants over 65 years of age?   ☐ Yes   ☒ No

c) Do participants have limited ability to give voluntary consent? This could include cognitively impaired persons, prisoners, persons with a chronic physical or mental condition, or those who live in or are connected to an institutional environment.   ☐ Yes   ☒ No

d) Are any invasive techniques involved? And/or the collection of body fluids or tissue?   ☐ Yes   ☒ No

e) Is an extensive degree of exercise or physical exertion involved?   ☐ Yes   ☒ No

f) Is there manipulation of cognitive or affective human responses which could cause stress or anxiety?   ☐ Yes   ☒ No

g) Are drugs or other substances (including liquid and food additives) to be administered?   ☐ Yes   ☒ No

h) Will deception of participants be used in a way which might cause distress, or might reasonably affect their willingness to participate in the research? For example, misleading participants on the purpose of the research, by giving them false information.   ☐ Yes   ☒ No

i) Will highly personal, intimate or other private and confidential information be sought? For example sexual preferences.   ☐Yes   ☒ No

j) Will payment be made to participants? This can include costs for expenses or time.   ☐Yes   ☒ No

If yes, provide details:

k) Could the relationship between the researcher/ supervisor and the Chinonye e such that a participant might feel pressurised to take part?   ☐Yes   ☒ No

l) Are you working under the remit of the Human Tissue Act 2004?   ☐Yes   ☒ No

m) Do you have an approved risk assessment form relating to this research?   ☐Yes   ☒ No

13. Proposed start and completion date

Please indicate:

- When the study is due to commence.

- Timetable for data collection.

- The expected date of completion.

Please ensure that your start date is at least five weeks after the submission deadline for the Ethics Sub-Committee meeting.

The fieldwork will commence on the 14th October 2021. I will be conducting life history

interviews with 6 black British women in the STEM field within the UK higher education sector.

These two sets of interviews will be conducted for the period of 4 months. First, I will distribute

biographical questionnaire to these women for the period of 6 weeks to gain information on

their personal background. Second, I will conduct two sets of semi-structured interviews to gain

in depth information on their views and experiences in relation to obtaining secure

employment and promotions in the STEM field within the UK higher education sector. The

expected date of completion for these interviews will be late February 2022 with analysis and

writing up over the spring 2022.

14. Sponsors/collaborators

Please give names and details of sponsors or collaborators on the project. This does not include

your supervisor(s) or St Mary's University.

- Sponsor: An individual or organisation who provides financial resources or some other

  support for a project.

- Collaborator: An individual or organisation who worksontheproject as a recognised

  contributor by providing advice, data or another form of support.

None

15. Other Research Ethics Committee Approval

Please indicate:

- Whether additional approval is required or has already been obtained (e.g. an NHS Research Ethics Committee).

- Whether approval has previously been given for any element of this research by the University Ethics Sub-Committee.

Please also note which code of practice / professional body you have consulted for your project.

No approval has been previously given and we do not need approval from the NHS research ethics committee.

16. Purpose of the study

In lay language, please provide a brief introduction to the background and rationale for your study. *[100 word limit]*

My research explores the life stories of black women early career academics in the STEM field within the UK higher education institutions. Statistics shows that, there are less than 2% of black women academics in the UK STEM field (The Guardian, 2020). Prior literature suggests that the shortages of black women in this field is due to lower teacher expectations and racial stereotyping that excludes young black girls from studying science subjects in secondary schools. This study seeks to explore how black women early career academics narrate and frame their experiences in relation to the levels of representation in the STEM field and their ability to obtain secure employment and promotions in the STEM fields within the UK higher

education institutions. This study is interested in diversity in STEM and will contribute to explore the motivations and aspirations of young black girls/women pursuing careers in STEM field.

17. Study design/methodology

In lay language, please provide details of:

a) The design of the study (qualitative/quantitative questionnaires etc.)

b) The proposed methods of data collection (what you will do, how you will do this and the nature of tests).

c) The requirement of the participant i.e. the extent of their commitment and the length of time they will be required to attend testing.

d) Details of where the research/testing will take place, including country.

e) Please state whether the materials/procedures you are using are original, or the intellectual property of a third party. If the materials/procedures are original, please describe any pre-testing you have done or will do to ensure that they are effective.

    a) This study is a qualitative study informed by an interpretivist philosophy to interview 6 black British women in the STEM field within the UK higher education sector. From an epistemological standpoint, this study is informed by an interpretivist/ social constructionism position, that emphasizes on subjectivity and the existence of multiple realities rather than the positivist perspective that

emphasizes on one 'objective' reality or 'measurable truth' (Bryman, 2016,p.30).Data gathered in this study will be subjective considering that, my study uses the life history method which involves the researcher gathering data from individual's narratives/stories (Goodson and Sikes, 2001). The life history approach is promoted by (Goodson and Sikes, 2001) as the most suitable method to gain personal stories from individuals in relation to a social phenomenon. The strength of using this method lies in depth rather than breadth. Life history method is most suitable for this study because The study explores the life stories, experiences and perspectives of black women scientists in the UK STEM field. (Question A-answered).

b) The study draws on life history methods to gain in depth information on the participant's background, experiences, and views on the shortages of black women early career academics in the STEM field within the UK higher education sector. This study combines life history methods and the theoretical blend of Critical Race Theory, Decolonial thoughts and Bourdieu cultural capital theory considering that these theories and method is focused on the narratives or stories of marginalised groups in society namely people of colour. To do this, the study will use biographical questionnaires [this tool will enable me to gather information on the participant's personal background] – followed by semi structured interviews - to gain in depth insight on their professional experiences in the STEM field within the UK higher education sector. A small sample of up to 6 black British women will be recruited who work currently in the STEM field within the UK higher education

sector to provide depth rather than breadth in this study. I will recruit this sample

from online platforms including Facebook, Twitter, Instagram and University staff

profiles.

Questionnaires are traditionally used for quantitative research (Lewin, 2011) or with large

samples from a distance (Greener, 2011). However, questionnaires can also be used in

qualitative research due to its flexibility (Cohen et al, 2011). My approach to using biographical

questionnaires was influenced by (Goodson, 2013) insistence on creating a genealogy of the

context or historical background. First, I will distribute biographical questionnaires to the

participants consisting of questions about their personal backgrounds for the period of 6

weeks. The purpose of this biographical questionnaire is to give a snapshot of the participant's

personal background, the schools they have gone to, the universities they have attended as

well as their employment history.

Alongside with these questionnaires, semi-structured interviews are used to gain insight on the

black women's views and experiences in relation to obtaining secure employment and

promotions in the UK STEM field. My approach is guided by Goodson and Sikes (2001)

preference for informal styles of 'interview conversations'. Hence, I chose to conduct 6 semi-

structured interviews with 6 black women scientists in UK universities over the course of 4

months to review the answers the participants have provided in their questionnaires and gain

in depth insight on the women's experiences and career trajectories in the STEM field within

the UK higher education institutions.

With the life history interviews, each participant will be interviewed twice. The first interview will focus on the questions in the interview guide while the second interview will focus on issues, they have raised in the first interview (Goodson and Sikes, 2001).

Also, an example of the interview guide will be submitted with the thesis. After transcribing the first interviews, I will design different sets of questions to ask each participant. The second round of interviews will be divided into two stages: all informants will be asked the same questions in the main part of the interview, followed by the questions targeted at them specifically based on the issues raised in the first round. The follow up interviews will re-visit the emergent issues in the first round, but we will discuss about specific issues that are unique to each participant. The unique questions aimed at the participants were designed to allow them to elaborate on specific events and issues in their careers. The interviews will be conducted in two distinct ways including:

•   Initial interview

•   Follow up interviews

With life history interviews, the researcher is required to follow up three procedures including narration, collaboration and location (Gill and Goodson, 2011). (Question B- answered).

C/D) The inclusion criteria for the participants in this study are black women early career academics in STEM field within the UK higher education institutions that are aged between (25-50) years who have completed their doctorates in the last 10 years.

Participants are required to fill up the biographical questionnaires concerning their personal and professional background and they will be interviewed twice over the course of 4 months. Each interview will last up to an 1 hour. (Questions C and D- answered).

E) The materials in this study are original considering that the researcher will create an interview guide consisting of original questions related to this study. I will conduct pilot interviews with fellow doctoral students at St Marys university to get feedback on the questions in the interview guide.

18.Participants

Please mention:

a) The number of participants you are recruiting and why. For example, because of their specific age or sex.

b) How they will be recruited and chosen.

c) The inclusion/exclusion criteria.

d) For internet studies please clarify how you will verify the age of the participants.

e) If the research is taking place in a school or organisation then please include their written agreement for the research to be undertaken.

f) Please state any connection you may have with any organisation you are recruiting from, for example, employment.

a) The study will focus on the life histories of 6 black British women academics in the UK STEM field to gain in depth insight on their experiences, stories and views about the STEM field within the UK higher education institutions. I chose Black women who have spent most of their education in the UK. Participants will be black women are early career academics who have completed their doctorates in the last 10 years because this group are an under researched area in the literature and due to convenience, I will have potential access to early career academics than senior academics. There is burgeoning scholarly interest on the academic workplace which is often raced and gendered. I am interested in exploring the stories of academics who have completed their doctorates and presently working in academia. (Question A- answered).

b) To recruit potential participants, I will approach the Black Women in Science network and send a recruitment email from participants to individual who fulfil the inclusion criteria – using their university staff profile. When participants are recruited – each will be sent a biographical questionnaire that covers details including their names, age, department, university, and more personal details about their family background. Interviews will take place online via zoom and in person Covid permitting depending on convenience and the preference of the participant. (Question B- answered).

c) My inclusion criteria are black women early career academics who have completed their PhD in the last 10 years because I would like to examine the extent to which race, gender and location shape these women's experiences in the UK STEM field. My

exclusion criteria are men, women from other ethnic groups, senior academics, and

academics older than 50 years. (Question C- answered).

d) N/A

e) N/A

f) I am a member of the Black Women in Science network online; this is the organisation where

I will recruit these participants.

19.Consent

If you have any exclusion criteria, please ensure that your Consent Form and Participant

Information Sheet clearly makes participants aware that their data may or may not be used.

a) Are there any incentives/pressures which may make it difficult for participants to refuse to

  take part? If so, explain and clarify why this needs to be done.

b) Will any of the participants be from any of the following groups?

  ➢ Children under 18

  ➢ Participants with learning disabilities

  ➢ Participants suffering from dementia

  ➢ Other vulnerable groups.

  If any of the above apply, state whether the researcher/investigator holds a current DBS

  certificate (undertaken within the last 3 years). A copy of the DBS must be supplied

  separately from the application.

c) Provide details on how consent will be obtained. This includes consent from all necessary

  persons i.e. participants and parents.

a)   There are no incentives/ pressures that may make it difficult for a participant to refuse

to be involved. Voluntary informed consent and withdrawal will be clearly expressed on the

Participant info sheet.(Question A- answered).

 B) No vulnerable groups listed are the focus of this study. (Question B- answered).

C) My research is dealing with participants above the age of 18 years, and we will be discussing

about their professional experiences, stories and views concerning obtaining secure

employment and promotion in the STEM field within the UK higher education institutions. I

chose snowball sampling that enables me to recruit participants based on referral (Bryman,

2016). I will send the written informed consent forms accompanied with a message describing

what my study is about and what is expected of them as participants. Also, I would include the

participants information sheet that covers what my research is about, and the risk involved.

Once, participants have agreed to participate in this study, they will be asked to sign the forms

and send it back to me. Anonymity and confidentiality will be assured in this study, the

researcher will use pseudonyms to conceal the identity and respective institutions of these

participants in the study. (Question C -answered).

20.Risks and benefits of research/activity

a) Are there any potential risks or adverse effects (e.g. injury, pain, discomfort, distress,
   changes to lifestyle) associated with this study? If so please provide details, including
   information on how these will be minimised.

b) Please explain where the risks / effects may arise from (and why), so that it is clear why
   the risks / effects will be difficult to eliminate or minimise.

c) Does the study involve any invasive procedures? If so, please confirm that the researchers
   or collaborators have appropriate training and are competent to deliver these procedures.
   Please note that invasive procedures also include the use of deceptive procedures to
   obtain information.

d) Will individual/group interviews/questionnaires include anything that may be sensitive or upsetting? If so, please clarify why this information is necessary (and if applicable, any prior use of the questionnaire/interview).

e) Please describe how you would deal with any adverse reactionsparticipants might experience. Discuss any adverse reaction that might occur and the actions that will be taken in response by you, your supervisor or some third party (explain why a third party is being used for this purpose).

f) Are there any benefits to the participant or for the organisation taking part in the research?

   a) When dealing with human participants, there is potential risk for upset or distress in the study. However, this is a minimal risk project as participants are aged above 18 years and they are expected to recollect stories and experiences in relation to their professional lives. There may be potential discomfort which may arise from participants sharing their life stories and experiences concerning issues of institutionalised racism and sexism they may have faced in the workplace. (Question A- answered)

   b) The potential discomfort may arise when participants are told to recollect their stories and experiences concerning issues of racism and sexism in the workplace. However, if the participants become distressed, I will pause the interview, allow them to recover, check if they wish to continue, ask about their wellbeing and remind them their right to withdraw from the study. I may also signpost them to the support services in their respective institutions (Question B- answered).

c) All information regarding this study is included in the participant's information sheet. I will not be using any deceptive methods to gather data in this study (Question C-answered).

d) There is no sensitive information in the participants information sheet rather participants are expected to recollect stories and experiences regarding their professional lives (Question D-answered).

e) I will remind the participants of their right to withdraw from the study if they wish, I will stop the interview, give them an opportunity to recover, ask about their wellbeing and I will signpost them to support services in their respective institutions (Question E-answered).

f) There are no incentives given to participants, they are free to participate and withdraw at any point of the interviews (Question F-answered).

21. Confidentiality, privacy and data protection

- Outline what steps will be taken to ensure participants' confidentiality.

- Describe how data, particularly personal information, will be stored (please state that all electronic data will be stored on St Mary's University servers).

- *If there is a possibility of publication, please state that you will keep the data for a period of 10 years.*

- Consider how you will identify participants who request their data be withdrawn, such that you can still maintain the confidentiality of theirs and others' data.

- *Describe how you will manage data using a data a management plan.*

- *You should show how you plan to store the data securely and select the data that will be made publically available once the project has ended.*

- *You should also show how you will take account of the relevant legislation including that relating to data protection, freedom of information and intellectual property.*

- Identify all persons who will have access to the data (normally yourself and your supervisor).

- Will the data results include information which may identify people or places?

- Explain what information will be identifiable.

- Whether the persons or places (e.g. organisations) are aware of this.

- Consent forms should state what information will be identifiable and any likely outputs which will use the information e.g. dissertations, theses and any future publications/presentations.

This research will follow British Educational Research Association (BERA) 2018 guidance. In addition, the study will seek ethical approval from St Mary's University ethics. Throughout this research, I will ensure that all ethical aspects have been considered appropriately. The identity of all the participants will be kept confidential to maintain the privacy of their views regarding this study (Doody and Noonan, 2013). The consent forms will be given to the participants based on the principles of autonomy and informed choices (Davies, 1983). I will ensure anonymity and confidentiality by using pseudonyms in my data analysis to ensure that their identities are hidden with regards to their responses in this study. The use of pseudonyms in research analysis protects the identity of participants in social research (Bryman, 2016).

This study will follow the St. Marys data management plan. I will be following the Data Protection Act -1998. This means that all data will be held password protected securely on the St Mary's cloud. I will store the data on St. Mary's servers, and I will only share the files with my supervisory team.This data will no longer be in use 10 years after my departure from the university. I will use pseudonyms and codes will be used to conceal the identity of the participants. Each participant will have codes to enable me to identify their responses should they wish to withdraw from the study, I will withdraw any response from the participants who wish to withdraw from the study. The names of participants, their universities and locations will be concealed in this study to ensure anonymity and confidentiality in this study. Instead, I will create a briefing based on the result for the Higher Education sector about how to support and promote Black women in STEM field.

22. Feedback to participants
Please give details of how feedback will be given to participants: • As a minimum, it would normally be expected for feedback to be offered to participants in an acceptable format, e.g. a summary of findings appropriately written. • Please state whether you intend to provide feedback to any other individual(s) or organisation(s) and what form this would take.
At the final stages of the data analysis, I would ask the participants to verify accounts by checking interview transcripts and your initial analysis. I will offer a brief summary of the main findings and analysis and offer a verbal briefing/ paper to the Black Women in Science network.

The proposer recognises their responsibility in carrying out the project in accordance with the University's Ethical Guidelines and will ensure that any person(s) assisting in the research/ teaching are also bound by these. The Ethics Sub-Committee must be notified of, and approve, any deviation from the information provided on this form.

Name of Proposer:	Peace C Akuwudike		
Signature of Proposer:	Peace C Akuwudike	Date:	10th September 2021
Name of Supervisor (for student research projects):	Dr Fiona Cullen Dr Paul Tarpey		
Signature of Supervisor:	Paul Tarpey FJ Cullen	Date:	13th September 2021

Approval Sheet

(This sheet must be signed at all relevant boxes)

Name of proposer(s)   Peace C Akuwudike

Name of supervisor(s)   Fin Cullen/ Paul Tarpey

Programme of study   PGR/ M Phil

Title of project   Exploring the life histories of black women early career academics in

                             STEM field within the UK higher education sector.

Supervisors, please complete section 1. If approved at level 1, please forward a copy of this Approval

Sheet to the Faculty Ethics Representative for their records.

SECTION 1: To be completed by supervisor.(for student research projects). PhD/MPhil applications
must be referred to and reviewed by an Ethics Representative at Section 2 below.
X☐ Approved at Level 1.

X ☐ Refer to Ethics Representative for consideration.			
Name of Supervisor:	FJ CULLEN		
Signature of Supervisor:	FJ CULLEN	Date:	13/9/21

SECTION 2: To be completed by Ethics Representative.			
☐ Approved at Level 1 ☐ Approved at Level 2 ☐ Level 3 consideration is required by Ethics Sub-Committee.			
Name of Faculty Ethics Representative:			
Signature of Faculty Ethics Representative:		Date:	

Exploring the stories and experiences of black women early career academics in the Science Technology Engineering Mathematics (STEM) in the UK higher education institutions.

Participant information sheet

Introduction

My name is Peace Akuwudike, an MPhil student at St Mary's University Twickenham, London. I would like to invite you to take part in a research study on 'Exploring the stories and experiences of black women early career academics in the Science Technology Engineering Mathematics (STEM) field within the UK higher education sector'. According to the (Guardian newspaper, 2020) 'there are less than 2% of Black women scientists in the UK higher education sector. Prior literature has attributed the shortages of Black women in this field to lower teacher expectations and racial stereotyping that excludes young Black girls from studying science subjects in secondary school. Thus, this study examines the experiences of Black women working in the UK STEM field, to ascertain how their experiences are shaped by race, gender, and location.

Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if

anything you read is not clear or if you would like more information. Take time to decide whether to take part.

This study has undergone ethics review in accordance with St Mary's University Research ethics committee.

- You have been invited to participate because you are Black women early career academics working in STEM field who have completed their doctorates within the last 10 years and are aged (25-50) years.

- Participation is completely voluntary, and you have right to refuse participation, refuse any question and withdraw at any time without any consequence whatsoever.

Purpose of study

- This study will examine the extent to which race, gender and location shapes the experiences of Black women early career academics in the STEM field within the UK higher education sector.

- This study is important because exploring the experiences of black women in STEM can provide support including mentoring programs for young black girls' future aspirations and the development in this field.

- Data gathered from this study will be included into future publications including my thesis and journal articles.

Descriptions of the study procedures

- I am interested in hearing about your life history and your career. If you agree to participate in this study, you will be asked to complete a biographical questionnaire that covers who you are, what you do, where you are from and how did you grow up. `You will be asked to participate in two subsequent interviews at a mutually convenient date/ time. These

interviews will be audio recorded and ask you about your personal background and professional experience in the STEM field within the UK higher education institutions. Each interview will last a maximum of 2 hours. Interviews will be held online via zoom or in-person depending on public health conditions and/or your preference. Also, I will send you the transcripts of the interview to verify the contents matches with your responses before inclusion into the thesis.

Risks involved in this study

- This is a lowrisk study as you are only required to talk about how you grew up in the UK and your professional experience. However, the only issues involved is that you may have to recollect the challenges you have faced in relation to your experiences in obtaining secure employment and promotions in the STEM field within the UK higher education sector.If you have experienced any discomfort, I will pause the interview, check your well being as appropriate and signpost you to support services that are available in your respective institutions. At any point, you are free to withdraw at any point or to choose not to answer some questions and avoid sensitive topics.

Confidentiality

Data collected in this study will be kept strictly as confidential as within legal limits. Only I and my supervisors will have access to the files. Anonymity will be assured in this study, I will use pseudonyms to protect the identity of the respondent and their institutions throughout the research. You and your respective institutions will not be identified in any reports or publications. All digital files, transcripts and summaries will be given codes and stored separately from any names or other direct identification of participants. Interviews will be recorded and stored on a secure St Mary's University server for the period of ten years.

What happens with the results of this study

The transcripts will be included in the MPhil thesis and in future publications

Further information

If you have any questions regarding this study please contact the researcher:

701670@live.stmarys.ac.uk

Many thanks for reading this information sheet.

Contact details of supervisors

Dr Fiona Cullen, Senior Lecturer in Education Studies. St. Marys University, Twickenham.

Telephone: 020 8240 4000 (2385). Email address: fiona.cullen@stmarys.ac.uk

Dr Paul Tarpey, Senior Lecturer in Education Studies. St Marys University, Twickenham.

Telephone: 020 8240 4125. Email address: paul.tarpey@stmarys.ac.uk

Chinonye iographical detail form

Personal details

m) What is your name? _____

n) Which age group do you belong to? (25-35) (36-40) (41-45) (46-50)[*please highlight in yellow the age group you are in*].

o) Where were you born? _____

Education

p) Primary school attended? _____ Dates _____

q) Secondary school attended? (Single sex schools) (mixed sex -schools) (Private schools) (State school) (Grammar schools) (Comprehensive schools) [*please highlight in yellow which type of secondary school you attended*].

r) What are the dates you attended this school? _____

s) University/College attended? _____ Dates _____

t) What course did you study? _____

Employment

u) Which type of higher education institutions do you work at? (*Russell group university*) (*non-Russell group university/post 1992 universities*). [*Please highlight in yellow the category you belong to*]

v) Which position do you hold at this higher education institution? _____

w) Career progression- can you summarize your career trajectory?

_____

_____

<u>Preliminary Interview guide</u>

<u>Background & education</u>

9. Tell me a little bit about where you were born and how you grew up?

10. How would you describe your background to someone who is unfamiliar?

11. What kinds of work were your family involved in?

12. What were your parents' experiences of education?

13. How did it shape your ambitions?

14. How was science talked about at home?

15. How was science talked about among friends and in the community where you lived?

16. What was your experience studying science subjects at secondary school?

17. What were your aspirations with studying science subjects at secondary school?

18. Did you attend supplementary schooling while in secondary school?

Higher education and training

19. How was studying science subjects at university different from that of secondary

    school?

20. How did you start working in the UK STEM field?

21. What is your experience working in your laboratory?

Employment and progression

22. What was your experience in gaining secure employment in the STEM field within

    the UK higher education institutions?

23. What are your thoughts on gaining promotions in the STEM field within the UK higher education institutions?

Barriers and opportunities

24. What are the barriers you encountered in obtaining secure employment and promotions in the UK STEM field?

25. What are your thoughts on success and career advancement in the STEM field within the UK higher education institutions?

26. What advice would you give your younger self concerning your aspirations to becoming a scientist in the UK academia?

<u>Wording for the emails to be sent to the participants</u>

Dear Participants,

My name is Peace C. Akuwudike, an MPhil student at St. Mary's University, Twickenham, London. I would like to invite you to participate in my study namely 'exploring the life histories of black women early career academics in the Science Technology Engineering and Mathematics [STEM] within the UK higher education institutions. According to (The Guardian Newspaper, 2020) 'There are less than 2% of black women scientists in the UK

higher education institutions". Prior literature has attributed the shortages of black women in the STEM field to lower teacher expectations and racial stereotyping that excludes young black girls from studying science subjects in secondary schools. This study examines the role of race, gender, and location in shaping the experiences of black women early career academics in the STEM field within the UK higher education institutions. My inclusion criteria for this study are black women early career academics in the STEM field who have completed their PhD's in the last 10 years aged between (25-50) years). You are required to read the consent forms properly and ask any questions that you may have before agreeing to participate in this study.

If you agree to participate in this study, you will be asked to complete a brief biographical questionnaire that covers who you are, what do you do, where are you from and what was it like growing up in the UK. Also, you will be required to attend two sets of interviews lasting up to an hour to answer some questions about your personal background and professional experience in the STEM field within the UK higher education institutions. The only risk involved potential discomfort in remembering challenges you may have faced in relation to obtaining secure employment and promotions in the STEM field within the UK higher education sector. Thanks and Kind regards.

Best Wishes,

Peace.

Exploring the life histories of black women early career academics in the STEM field within the UK

higher education institutions.

Name of Participant: _____

Title of the project: Exploring the life histories of black women early career academics in the

STEM field within the UK higher education

institutions_____

Main investigator and contact details: _____Peace Akuwudike

(701670@live.stmarys.ac.uk)_____

Members of the research team:

1.   I agree to take part in the above research. I have read the Participant Information Sheet which   is attached to this form. I understand what my role will be in this research, and all my questions   have been answered to my satisfaction.

2.   I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.

3.   I have been informed that the confidentiality of the information I provide will be safeguarded.

4.   I am free to ask any questions at any time before and during the study.

5.   I have been provided with a copy of this form and the Participant Information Sheet.

Data Protection: I agree to the University processing personal data which I have supplied. I agree to the processing of such data for any purposes connected with the Research Project as outlined to me.

Name of participant (print)………………………………………………………………………...

Signed……………...………………   Date…………………………..........

If you wish to withdraw from the research, please complete the form below and return to the main

investigator named above.

Title of Project: _____

I WISH TO WITHDRAW FROM THIS STUDY

Name: _____

Signed: _____ Date: _____

COVID19 DECLARATION FORM FOR RESEARCH PARTICIPANTS

(To be signed in addition to the Consent Form – please read carefully)

- I have not displayed any COVID-19 symptoms or tested positive for COVID-19 in the 14 days
  before taking part in the research study.

- I have not knowingly been in contact with anyone displaying COVID-19 symptoms or who
  has tested positive for COVID-19 in the 14 days before taking part in the research study.

- I am not shielding due to underlying health conditions

- I have read, understood and signed the separate additional protocol specific Covid-19 safety
  measures (if appropriate)*

- I understand St Mary's has implemented Government measures to limit the spread of
  Coronavirus such as providing anti-bacterial hand gel throughout the University,
  implementing social distancing by utilising a one-way system for walking around the
  University, and limiting classroom participants. As such, all possible safety measures have

been put in place to make the relevant research activity as safe as is reasonably possibly. I accept it is my own decision to participate and that St Mary's University cannot be held liable in the event I develop symptoms or COVID-19 infection.

I understand that if during the research, or within two weeks after the last research activity, I develop COVID-19-related symptoms (a new continuous cough, a high temperature, a loss or change to your sense of smell or taste), or come into contact with someone who has tested positive for COVID-19, I must:

- Report the developed symptoms to the lead researcher (lead researcher to insert their name and email address here)**

- Cease participation in the relevant study or studies with immediate effect

- Commence the Government Test and Trace process (https://www.gov.uk/guidance/nhs-test-and-trace-how-it-works) and complete the Test and Trace team advised isolation period if tested positive for COVID-19.

You will be able to resume participating in your St Mary's University research activity ONLY once you have received written confirmation from the Government Test and Trace management team that you are permitted to do so, and/ or you have received a negative test result and feel well enough (evidence will be required).

* The researcher must ensure they provide participants with a copy of any protocol specific COVID-19 safety measures in advance of the testing and ask them to initial this alongside signing the consent form and CovId-19 Declaration Form.

** If the researcher receives notification from participants then they must immediately alert James Simms (james.simms@stmarys.ac.uk) and the Research Office (research@stmarys.ac.uk)

Title: ***Exploring the life histories of black women early career academics in the STEM field within the UK higher education sector.***

Name of participant _____

Signature of participant _____

Date _____

PARTICIPANT MUST BE GIVEN A COPY OF THIS FORM TO KEEP

Ethical clearance letter

2nd October 2021

Dear Peace,

I am writing to confirm that your application for ethical approval of your M Phil research

enquiry has been approved at Level 1.

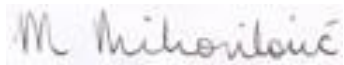**Researcher's name:**

Peace C. Akuwudike

Regnum:

701670

Title of project:

Exploring the life histories of black women early career academics in STEM field within the

UK higher education sector.

Supervisor

Dr Fiona Cullen

Should you have any queries please do not hesitate to contact me.

Dr Mary Mihovilović

Institute of Education Ethics Representative