Swansea University
Prifysgol Abertawe

Equality, Diversity, and Inclusion Initiatives in Postgraduate Engineering

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Submitted to Swansea University in fulfilment of the requirements for the Degree of Master of Science by Research

2025

M2A COATED
Consolfan Cyngor Ymchwil Peirianneg a'r Gwyddorau Ffisegol ar gyfer Hyfforddiant Doethurol mewn Caenu Diwydiannol Gweithredol
EPSRC Centre for Doctoral Training in Functional Industrial Coatings
Yr Academi Deunyddiau A Gweithgynhyrchu
Materials and Manufacturing Academy

UKRI Engineering and Physical Sciences Research Council

Undeb Ewropeaidd
European Union
Llywodraeth Cymru
Welsh Government
Cronfa Gymdeithasol Ewrop
European Social Fund

ABSTRACT

UK Higher Education (HE) is characterised by disproportionately low participation rates of minority ethnic groups, particularly in postgraduate study, and there are stark differences between ethnic groups in terms of retention, outcomes, and progression. Disparities increase at higher levels of education, suggesting the existence of barriers to the progression of minority ethnic students into postgraduate education. The impact of this appears to continue beyond HE, as disparities persist into employment and progression to senior levels. Such disparities have led to a large focus on the implementation of interventions that aim to improve equality, diversity and inclusion (EDI).

This work examines the implementation of a pilot EDI programme for minority ethnic engineering doctorate students at a UK Higher Education Institution (HEI). Throughout the EDI programme, students participated in coaching sessions and leadership development sessions with two external providers and received formal sponsorship from senior staff members. This research investigates the decision-making processes regarding the programme and the impact of the course within the wider context in which it was implemented. A thematic approach is utilised to analyse data from semi-structured interviews held with key stakeholders involved in the course: students who participated, external providers who delivered the course, sponsors, and university staff members who implemented the course. Thematic analysis is also performed on programme documentation. The key findings highlight the potential benefits of coaching, leadership development, and sponsorship for minority ethnic postgraduate research students, certain ways in which the institutional culture may limit the advancement of EDI, particularly related to race equity, and the importance of authentic institutional support of EDI for meaningful change. The data-driven conclusions provide recommendations to improve the EDI landscape within the institution and elsewhere.

DECLARATIONS

Declarations

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed 

Date 02/07/2025

This thesis is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

Signed 

Date 02/07/2025

I hereby give consent for my thesis, if accepted, to be available for electronic sharing

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Date 02/07/2025

The University's ethical procedures have been followed and, where appropriate, that ethical approval has been granted.

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Date 02/07/2025

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ACKNOWLEDGEMENTS

I would like to thank Dr Natalie Wint and Dr David M. Rea for your time, guidance and wisdom throughout this research project.

I would also like to thank the Materials and Manufacturing Academy and COATED CDT (COATED M2A) in Swansea University, Engineering and Physical Sciences Research Council (EPSRC via UKRI) (EP/S02252X/1), and the European Social Fund via the Welsh Government (WEFO) for supporting the work described in this thesis.

A sincere thank you to all participants for trusting me and sharing your experiences and insights. This research would not have been possible without your contribution.

Finally, thank you to my partner, our families, and friends for your patience, encouragement, and support over these last few years. I will always be so grateful, and I will never forget you all coming together to move me into my new flat while I finished this project!

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DEFINITIONS

Engineering culture: The shared values, norms, and behaviours that shape how engineers think, work, and interact within educational and professional settings (Atadero et al., 2018).

Engineering Doctorate (EngD): EngD students are a type of postgraduate research (PGR) student who carry out original research at the doctoral level. In addition to academic study, they work closely with industry partners, combining research with practical, real-world engineering experience.

Equity/Equality, Diversity and Inclusion (EDI): A strategic approach and set of practices aimed at ensuring fair treatment, valuing differences, and fostering a sense of belonging within institutions, particularly addressing systemic barriers faced by underrepresented groups (Dewidar et al., 2022).

Institutional culture: This term refers to the shared values, beliefs, and assumptions that influence behaviour, interactions, and decision-making processes within an institution (Tierney & Lanford, 2018).

Minority ethnic/ethnic minority: This thesis uses the term *minority ethnic* to refer to individuals from ethnic groups that are underrepresented within the UK. It is the preferred term in UK equality, diversity, and inclusion (EDI) policy and practice, as it centres ethnicity rather than defining individuals in contrast to a majority. The term *ethnic minority* is also widely used, particularly in US literature, and may be used interchangeably where appropriate.

BAME / BME: The terms ‘BAME’ and ‘BME’ appear throughout this thesis in quotations and references because they are used by some academic papers and by the Institution during the period when the EDI programme was implemented. These terms may therefore appear when citing or discussing sources that use them. However, I do not use ‘BAME’ as a preferred term due to its contested and aggregated nature, opting instead to use ‘minority ethnic’ throughout the thesis.

Postgraduate / Postgraduate Research (PGR) Students: Postgraduate students are those studying beyond undergraduate level, including Master’s and doctoral degrees. Postgraduate research (PGR) students focus on conducting original

research, usually as part of a doctoral programme. In the US, the term “graduate students” is commonly used.

Sponsorship: A formal relationship where a senior colleague actively advocates for and supports the career progression of a junior colleague by providing opportunities, advice, and access to influential networks. It differs from mentorship, as it involves a more proactive role in promoting the protégé's career development (AdvanceHE, 2020).

1 INTRODUCTION

The lack of student diversity within engineering education, and indeed the engineering profession, has been studied extensively worldwide, with particular focus on students from minority ethnic backgrounds. The case is no different in the UK, where the retention and attainment of engineering students have been shown to vary significantly between ethnic groups (EngineeringUK, 2020). Whilst it is recognised that the participation rates of minoritised students vary across individual disciplines within science, technology, engineering, and mathematics (STEM) (Shamir et al., 2021), there exists a general underrepresentation of minority ethnic groups (EngineeringUK, 2019). Participation rates also vary between levels of study, with 32.3 % of those accepted onto UK-based engineering undergraduate courses in 2017 classed as minority ethnic, compared to only 22.2% at postgraduate research level (EngineeringUK, 2019). Such issues with persistence (which here refers to the transition from one career stage to another, for example, progressing from an undergraduate program to a postgraduate programme) indicate the existence of barriers to minority ethnic students in accessing postgraduate education. The impact of this appears to continue beyond HE, as disparities continue into employment and progression to senior levels (AdvanceHE, 2019).

Whilst different interventions have been implemented to improve EDI, many of these focus on fixing the ‘leaky pipeline’ (Metcalf, 2010) and the use of quotas. These approaches can be self-limiting in that they fail to consider the depth and complexity of the experience of individuals and how patterns of exclusion perpetuate in our culture. Critical research therefore suggests a need to examine the wider context in which barriers exist and to question and change the field itself (Lewis, 2003).

This research therefore focuses on evaluating one particular EDI programme within a UK-based postgraduate engineering research course, whilst also considering the wider context of the culture of engineering and barriers to the progression of people from minority ethnic backgrounds. The implementation of such interventions alone is not enough, and they should not be viewed as the ‘end point’ for improving EDI. Evaluation of EDI programmes such as this is thus necessary for real and sustainable improvements to be made.

Focusing on an EDI programme for minority ethnic Engineering Doctorate (EngD) students that ran for the first time at a UK institution, this work takes a case-study approach to build up a holistic picture of this particular EDI initiative and the wider system in which it exists, examining:

a) Barriers facing these minority ethnic postgraduate students in engineering education.
b) Potential benefits of EDI interventions such as this one.
c) Whether, and how, issues within the wider institutional and engineering culture may perpetuate disadvantage.

This research aims to examine experiences on the course, the issues faced by these students and the systemic and institutional structures in which they exist. It is hoped that such a study explores and addresses the factors that enable or disable engineering participation and makes useful recommendations about generating change to improve EDI in engineering.

Data was obtained through analysis of documentation related to the programme and through semi-structured interviews with students who took part in the EDI programme, staff involved in its instigation and implementation, and those who delivered it. Data analysis was undertaken to understand why this particular initiative was chosen and what it aimed to achieve.

The next section will provide the reader with the necessary background information to gain an understanding of the EDI programme that this research focuses on. The reader will then be guided through the literature review, and then the methodology of the study, which includes a positionality and reflexivity statement from the author and limitations of the research. The findings are then presented and discussed in relation to existing literature.

2 CONTEXT

2.1 THE INSTITUTION

The Institution is a public research university located in Wales, UK, with a student population of approximately 21,500 students, approximately 4800 of whom are postgraduate students, with 16,700 being undergraduate students (HESA, 2020/21). As of 2019/2020, 4962 'BAME' students attended the Institution, making up 29% of the student population (The Institution's Strategy Plan). It employs in excess of 4000 staff, across 3 academic faculties. As of April 2019, the College of Engineering delivered 22 undergraduate degree courses (with year in industry variations) to 3436 undergraduate students, 22 taught postgraduate courses to 157 postgraduate students, and 27 postgraduate research courses to 281 postgraduate students. At an institutional level, equality, diversity, and inclusion (EDI) are part of the main strategic document of the university and are linked with a need to improve student experience, widen participation and to create an environment of research excellence in which "all of the University community (area able to) fulfil their potential" (The Institution's Strategy Plan). The Strategic Equality Plan is set in the context of complying with the Equality Act (2010), and describes the protected characteristics as covered by the General Duty. The document lists nine 'Equality objectives', along with their success measures. Two are aimed at students, the first referring to a reduction in the 'BAME' degree awarding differential, and the second to embed inclusivity and diversity within the curriculum. There is also a recognition that "Intersectionality is …an increasing topic of consideration" to be "explored" (The Institution's Strategy Plan). The Centre for Doctoral Training (CDT) was established as part of the College of Engineering in 2015 with the aim of "creating the future leaders of Welsh industry through industry-sponsored postgraduate research". The CDT has benefited from financial support from the European Social Fund (ESF) through the Welsh European Funding Office (WEFO), part of the Welsh Assembly Government, which has been used to leverage funding from the UK Research and Innovation (UKRI) who are responsible for directing research and innovation funding provided by the UK governmental science budget. The ESF provides funding for employment projects within Europe and aims to ensure individuals have fair access to job opportunities and that they secure better jobs. The funding obtained by the CDT is therefore used to work towards two ESF investment priorities:

• “Enhancing equal access to lifelong learning for all age groups in formal, non-formal and informal settings, upgrading the knowledge, skills and competences of the workforce, and promoting flexible learning pathways including through career guidance and validation of acquired competences.”

• “Equality between men and women in all areas, including in access to employment, career. progression, reconciliation of work and private life and promotion of equal pay for equal work” (Welsh European Funding Office (WEFO), 2020)The CDT incorporates a UKRI funded CDT. UKRI claim that “CDTs should act as a beacon for equality, diversity, and inclusion (EDI) within the research and training community”. The CDT funding was obtained via a competitive process and the funding application included a two-page EDI plan which included:

• consideration of how the leadership and management teams would contribute to changing the culture, practices and makeup of the research community;

• evidence of ways in which EDI issues would be managed at both an institutional, CDT and wider community level and how the institution’s policies aligned with the approach taken by the CDT;

• progress indicators that would be used to indicate/measure improvement in diversity and inclusion;

• reference to how EDI would be considered during recruitment of staff, students, advisors;

• description of the ways in which the CDT would support career progression;

• the steps that would be taken to raise awareness of, and mitigate against, the impact of unconscious bias in the running of the CDT in terms of gender, ethnicity or any other protected characteristics through processes, behaviours and culture;

• A description of the way in which members of the CDT (staff, students, and partners) would act as ambassadors for EDI;

• A description of how the CDT’s EDI approach would evolve over the centre’s lifetime;

• how good practice would be captured and shared with the wider community (Welsh European Funding Office (WEFO), 2020).

In terms of existing support for minority ethnic students, the College of Engineering 'BAME Students in Engineering Network' was founded by a postdoctoral researcher who wanted to help students cope with challenges similar to those that they had faced during their academic study and career. The network has received small amounts of funding from the university and in the last two years they have: organised talks from external speakers (including themes of leadership, sponsorship, allyship, discrimination, barriers to career progression, inclusive teaching); arranged training on allyship for senior leadership; arranged training about inclusive marketing for the recruitment team; attended several HE conferences; and organised student listening forums. The 'BAME Students in Engineering Network' were also involved in discussions about implementing an EDI programme for minority ethnic EngD students.

2.2 THE EDI PROGRAMME

The EDI programme was initiated by a CDT in this UK HEI. The CDT was established as part of the College of Engineering in 2015, with the aim of "creating the future leaders of Welsh industry through industry sponsored postgraduate research".

The EDI programme was comprised of three components: leadership training, sponsorship and coaching. It took place over a three-month period and involved the collaboration of two external providers, one of whom delivered the coaching sessions, and the other of whom delivered the leadership sessions and guided the sponsorship. In its entirety, the programme included:

- three leadership workshops
- seven 1-hour one-to-one coaching sessions
- three half-day coaching masterclasses
- assignment of a sponsor (senior university staff member in leadership or management position) whose role was to help them exploit and plan career progression in the Institution or elsewhere.

Overall, there were eight attendees of the EDI programme. This included six minority ethnic students, one minority ethnic member of staff and one White student.

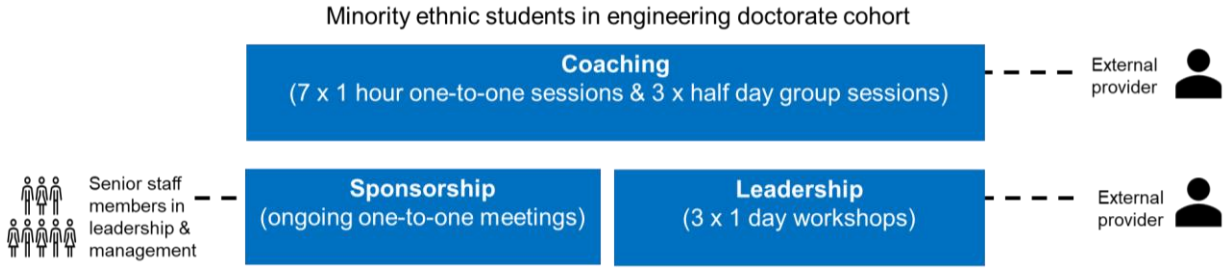

Figure 1: *A diagram of the structure of the programme*

3 LITERATURE REVIEW

Improving EDI has increasingly become a priority for UK HEIs over the years. Efforts to improve EDI through various initiatives and practices have certainly increased awareness of inequalities in HEI, yet inequalities persist. This research examines one specific EDI initiative implemented for minority ethnic engineering doctorate students in a UK HEI. To present a comprehensive understanding of the context in which this initiative was implemented, this literature review takes the reader through the background of race inequality in HE, the engineering-specific context, relevant efforts to improve EDI, and literature relevant to the EDI initiative at the focus of this research.

As this research focuses on an initiative implemented in response to the EDI issues facing minority ethnic engineering students, it is important to examine racial inequality in HE. This literature review therefore begins by examining literature that showed certain ways in which racial inequalities persist within UK HE generally and how these disparities continue into the careers of minority ethnic individuals. Whilst this research focuses on an engineering context, looking at racial inequality in the general HEI context in this way provides the reader with a contextual background that shows the pervasiveness of these issues within HE and that these issues are not limited to engineering. Then, the literature review narrows down to the engineering-specific context, highlighting how the racial inequalities in HE are reflected in engineering too. Raising questions as to what causes these issues and how they can be addressed, I, therefore, examine existing literature on EDI in engineering education and present key arguments that emerged from previous research.

A large focus of existing literature on this topic pointed to there being a distinct culture within engineering that posed barriers to EDI. Exploring this further, I define culture and the purpose that it is said to serve. I then introduce prominent arguments within the literature that assert that the engineering culture is constituted by specific cultural ideologies, which are said to be internalised and perpetuated across generations of engineers, due to a process of socialisation into the engineering culture that occurs throughout engineering students' education. The specific cultural ideologies are detailed later in the chapter, but first, the literature review delves into arguments that suggest that engineers must conform to the culture and adhere to its ideologies in order to fit in within the profession, or risk the potential consequence of contestations to their

sense of belonging in engineering. I then discuss how minority ethnic students in particular, who are underrepresented in engineering, may feel heightened pressure to conform to the culture in order to belong, based on literature that suggests that the need to belong is particularly strong for individuals from historically disadvantaged groups in situations where their group is underrepresented, and their abilities cast in doubt.

After discussing this potential consequence of not adhering to the engineering culture, I then discuss the potential consequences of adhering to the culture, according to existing literature, by reviewing the literature on the cultural ideologies and mindsets said to underpin the engineering culture. I first discuss technical-social dualism as one ideology, and how technical dimensions of engineering are said to be prioritised over the 'social' dimensions, which are consequently devalued. I then discuss another related ideology, depoliticisation, and how the idea that technology is neutral, asocial, and apolitical renders invisible the social and political foundations of engineering work and positions social dimensions, such as considerations of social justice, as irrelevant to engineering. Next, I discuss literature on meritocracy as the third ideology said to underpin the culture, and how it frames social inequalities as individual failings within a fair meritocratic process, which renders issues such as social inequality as social complexities that are not deemed relevant to engineering work or engineers. Then, I draw on related literature on mindsets in engineering, where it is argued that engineers are taught to develop an uncritical acceptance of authority in their engineering education, which can result in engineers not questioning ethical issues and taking a neutral stance in issues of injustice. All in all, I draw together this amalgamation of literature to bring forth the argument that these particular cultural ideologies and mindsets can remove non-technical, sociopolitical issues from the realm of engineering and thus from the concern of engineers, which in turn could negatively impact engineers' recognition and address of EDI issues. This is relevant to this research as the notion that the engineering culture could socialise engineers to not consider or address social issues may contribute an explanation as to why long-standing inequalities persist in engineering.

Furthermore, given that this research focuses on minority ethnic students, it is important to be informed on relevant literature on race. For this reason, the next part of the literature review introduces Critical Race Theory (CRT), as a lens through which

dynamics of race, power, and inequality can be examined. Before I delve deeply into CRT itself, first, I discuss the historical origins of CRT in the US and its deemed applicability in UK contexts, providing examples of studies which have employed CRT. [I then discuss how CRT has relevance within the engineering-specific context in which this research is situated.] I then go on to provide an overview of CRT and the key ideas that underpin it, including the five key tenets deemed central to CRT: 1) centrality of racism 2) White supremacy 3) voices of people of colour 4) interest-convergence 5) intersectionality. Following this overview of CRT, I demonstrate how CRT can be used to deconstruct racism and inequities in different contexts, drawing on CRT scholars' deconstruction of an affirmative action practice that was meant to address systemic inequalities, yet through a CRT lens, was argued to have instead promoted the assimilation of minority ethnic people to oppressive and dominant systems, rather than addressing these systems' historical issues. I argue that this example is demonstrative of the usefulness of policies and practices being deconstructed with a CRT lens, as doing so highlights EDI issues, even within contexts in which the intention is to progress EDI.

Given that this research examines an initiative implemented to improve EDI, next, the literature review provides the reader with a background of previous efforts that have aimed to promote change and improve EDI, in order to position this research within the context of wider EDI efforts that have taken place. I introduce the reader to efforts which have aimed to address EDI issues for minority ethnic students in HE generally. Next, the literature review presents certain pedagogies, policies, and practices that have been found to have a positive impact on EDI for minority students in engineering specifically, and some which have been frequently implemented for minority ethnic staff. After presenting this overview of different efforts that had been made within HE generally and engineering specifically, I next discuss some of the criticisms of EDI efforts to date, which are particularly pertinent to consider given the persistence of EDI issues despite efforts such as those depicted, as they may provide insight into better courses of action to take for making sustainable improvement to EDI.

3.1 Racial Inequality in Higher Education

Racial inequalities continue to exist within UK HEI and in HEIs worldwide, impacting both students and staff (Wong et al., 2021). Minority ethnic students tend to achieve

lower grades than their White counterparts, which some suggest is a result of factors such as: the history of White supremacy in HE, micro-aggressions, teaching methodologies, and the expectations and attitudes of teachers (Mahmud & Gagnon, 2023, p. 88; Wong et al., 2021). Disparities persist beyond education, where minority ethnic academics are less likely to reach professorial positions than their White counterparts (Bhopal & Pitkin, 2020) and minority ethnic academic staff are underrepresented in HE, with, for example, only 2 % of academic staff being Black, compared to 8 % of the student population being Black (HESA, 2020/21). The lack of representation of Black members of staff in HEIs is likely to have an impact on students who seek role models to guide their career decisions, and reduce the likelihood of Black students pursuing a career in academia (Coelho et al., 2022; Mahmud & Gagnon, 2023) and thus exacerbating the disparities.

In engineering, inequalities due to racial differences also persist, with large differences in the retention, outcomes and progression of minority ethnic student (EngineeringUK, 2020). Figures show that regardless of entry qualifications, minority ethnic students in engineering and technology are less likely to achieve a first or upper second-class degree compared to their White peers, at 72.9 % and 83.4 % respectively(EngineeringUK, 2019). They are also less likely to further their education after their undergraduate degree, with 32.3 % of those accepted onto UK based engineering undergraduate courses in 2017 being from minority ethnic backgrounds, compared to only 22.2 % at postgraduate research level (EngineeringUK, 2019). Employment outcomes also vary significantly between minority ethnic and White students, with Engineering UK's 2018 report showing less than half (48.6 %) of minority ethnic engineering and technology students who graduated in 2016 to be in full-time employment, compared to almost two thirds (65.6 %) of White graduates. In engineering occupations specifically, people from minority ethnic backgrounds make up only 9 % of the population (EngineeringUK, 2018) and out of the 9105 professors working in science, engineering and technology in 2018, only 40 of them were Black (AdvanceHE, 2018).

These disparities cannot be explained by aspirational differences, given that young people from minority ethnic backgrounds have been found to have higher educational and occupational aspirations than their White counterparts (Codiroli-Mcmaster, 2017); (Strand, 2013). The disparities therefore suggest the existence of barriers to

progression faced by engineers from minority ethnic backgrounds, signifying a challenge to EDI.

A wide array of literature relates such challenges to EDI to a) the culture of engineering and b) race and racism. The following sections therefore explore these two areas in relation to this research, starting with examining the engineering culture.

3.2 The Culture of Engineering

Given the engineering context in which this EDI initiative was implemented, it is relevant to explore the literature on the EDI landscape in engineering. A large focus of existing literature on this topic pointed to there being a distinct culture within engineering that posed barriers to EDI (Leydens et al., 2022).

I begin by defining culture. In a profession, historically rooted sets of beliefs, myths and rituals are ingrained in the skills, knowledge and practices of the profession, and this forms the professional culture (Cech, 2013). There are multiple purposes to a culture: it provides meaning to work, unites members of a profession as a social group, establishes the basis for forming professional identities within the group, creates distinctions between those within the profession and those outside of it, and provides rationale for the privileged social position maintained by its members (Abbott, 1988; Cech, 2013; Freidson, 1973; Grusky, 2005; Weeden & Grusky, 2005).

The profession of engineering is argued to have its own culture and social privileges that are distinct from others and relatively independent from wider societal culture (Abbott, 1988). It encompasses sets of beliefs about what it means to be an engineer, and cultural ideologies that shape how engineers view engineering work, what they perceive to be relevant or irrelevant to that work, and how they think about their work in relation to society (Cech, 2013). These cultural ideologies also provide a lens through which engineers interpret complex aspects of social life, internally and externally to their professional realm. Engineering students are deemed to be socialised to become part of this culture throughout their studies, where they may internalise the norms, beliefs and understandings of the world shared amongst those in the profession, causing the perpetuation of the culture across generations (Cech, 2013). Whilst many engineering students embrace the cultural ideologies of engineering, Cech argues that the perpetuation these ideologies does not require all

engineers to do so; their perpetuation solely requires engineers with conflicting beliefs to conform to the culture, and separate any differing personal beliefs from engineering contexts so as not to go against the grain (Cech, 2013). However, in order to fit in with the culture of the engineering profession, it is argued that engineers must adhere to these ideologies, whilst also possessing the required skills and competencies for practice in the profession (Dryburgh, 1999).

For those who do not fit in, it has been found that their sense of belonging may be contested (Verdin, 2021). Belonging can be defined as "a subjective feeling that one is an integral part of their surrounding systems" (Allen et al., 2021, p. 88). For example, one longitudinal study by Verdin (2021) on a minoritised student's experience in the engineering culture, found that the student's sense of belonging was contested and negotiated particularly when they were juxtaposed with their peers who fit the engineering culture, but also when they were positioned at the outskirts of engineering and when instructors reinforced a particular way of being an engineer. Non-assimilation to the norms or expectations within the culture of engineering appear to have resulted in negative consequences in terms of belonging for this student, which could serve to discourage not fitting in for others, as the behaviour and choices of individuals are argued to be driven by the need to be accepted by others and belonging within a community of peers (Dasgupta, 2011; Leary & Baumeister, 1995). However, issues such as this may be unlikely to be addressed or even considered in engineering, given arguments that engineering excludes discussions of identity, power and understandings of difference (Slaton, 2010). It could also particularly impact minority ethnic students, for whom it has been argued that belonging is of high importance, as Dasgupta posited that "because the need to belong is particularly strong under adversity or stress, it is likely to play an important role in the lives of individuals who belong to historically disadvantaged groups and find themselves in adverse situations where their group is numerically scarce and their abilities cast in doubt"(Dasgupta, 2011, p. 232). Minority ethnic students could, therefore, feel a strong need to belong and which could encourage them to conform more to the engineering culture and the norms of other settings that they enter in order to fit in. The fact that engineers may feel pressure to conform to the engineering culture or risk not fitting in within their profession and having their sense of belonging contested poses issues to EDI in itself, as it indicates a lack of inclusivity and discourages diversity of perspectives, something

which is of even greater concern given that it seems to disproportionately impact some groups over others. This highlights a concerning potential consequence of not adhering to the engineering culture which poses issues in terms of EDI.

Having discussed this potential consequence of not adhering to the engineering culture, I now discuss the potential consequences of adhering to the culture, according to existing literature, by reviewing the literature on the cultural ideologies and mindsets said to underpin the engineering culture. The three key ideologies within the culture of engineering identified by Cech (2013) are depoliticisation, which frames 'non-technical' issues such as public welfare as tangential to engineering work; technical-social dualism, which prioritises the technical details and devalues 'social' dimensions; and meritocracy, which presents existing social structures as being fair and just (Cech, 2014).

Technical-social dualism. This refers to a prominent ideology in engineering that the technical and social aspects of engineering problems are separate and separatable (Leydens et al., 2022), when in fact, they are intrinsically interlinked (Bijker et al., 1989). The result of this ideology is that technical work in engineering is valued above social considerations, which causes social dimensions to be bracketed and marginalised (Leydens & Lucena, 2017).

Depoliticisation. Related to technical-social dualism is the ideology of depoliticisation. Depoliticisation refers to the idea that technology is neutral, asocial and apolitical (Leydens & Lucena, 2017). This notion fails to consider the sociohistorical background of engineering and technology, and how it is not just technology that shapes society - society and technology mutually shape one another. (Riley et al., 2014). This idea renders invisible the political and social foundations of engineering work, and casts aspects of social life, such as considerations of social justice and equality, as political and therefore superfluous to engineering (Cech, 2013) (Cech & Waidzunas, 2011) (Faulkner, 2000). The way in which engineers are socialised into embracing or conforming to these ideologies is exemplified in the following extract from an engineering student at US university, in a study by Cech and Waidzunas:

"It's just a different way of communicating with engineers than with all the people that I tend to hang out with… You don't talk about your feelings, you don't talk about the world and what's happening in it…I wish there was more of that in school, more about

the consequences of technology, the history…Really, we're just doing the technical stuff". (Cech & Waidzunas, 2011) p.11

The student in this excerpt demonstrates recognition and criticism of depoliticization within engineering, yet also conformity to it. Despite not personally agreeing with the ideology, their acceptance of enacting a "different way of communicating with engineers" indicates their conformity and therefore reinforcement of the culture (Cech, 2013).

Meritocracy. The third common ideology, meritocracy, is the idea that social structures are fair and just, in that individuals' successes are due to sufficient talent and hard work, and that those who are not successful lack dedication and hard work, and thus somewhat deserving of their disadvantaged status (Cech, 2013) It can thus be used as an explanation for social inequalities, presenting unequal rewards as the result of fair and morally acceptable processes (Cech, 2013) (Cech & Blair-Loy, 2010). This ideology is largely endorsed in HE, where an emphasis is placed on the hard work of an individual as a means for success, instead of addressing structural issues that uphold social inequalities (Kane, 1995). It is acknowledged that some professions are more likely to promote a meritocratic ideology than others (Cech & Blair-Loy, 2010), and that in engineering particularly, the ideology of meritocracy is deeply ingrained and central to the professional socialisation of engineering students (Dryburgh, 1999). This means that engineers are socialised to view social inequalities as the result of fair meritocratic processes (Cech, 2013). Therefore, inequality being framed as the fair result of individual failings means that such social complexities are removed from what are viewed as issues relevant to engineering and to themselves as engineers (Cech, 2013).

These ideologies depicted by Cech (Cech, 2013, 2014) seemingly have the power to remove non-technical, sociopolitical issues from the realm of engineering and thus from the concern of engineers, which in turn could impact engineers' recognition and consideration of EDI issues. Cech's work builds upon work by Donna Riley on engineering mindsets (Riley, 2008), which seem to function to the same end. One mindset, which is not directly encompassed in the ideologies presented above, is the uncritical acceptance of authority that Riley claims students are taught to develop in their engineering education. Riley argues that this lack of criticality develops from the

narrow technical focus of engineering and lack of exposure to other ways of thinking and knowing (Riley, 2008), summarising that this acceptance comes from:

"a positivist mindset that sticks with the scientific method as the only way of knowing what we know, combined with a lack of exposure to other ways of knowing, or contexts in which those other ways of knowing are valued. [This mindset] can lead to a lack of questioning of certain types of information" (Riley, 2008, p. 42).

The consequences of habitually not questioning authority has been argued to result in engineers not questioning ethical issues, and taking an apolitical or neutral stance on issues of injustice (Riley, 2008; Shulman, 2006). Like with the ideologies depicted by Cech (2013), this could remove engineers' attention to and awareness of socio-political issues and social justice concerns, which could have further negative consequences for EDI issues being recognised or addressed in engineering.

Overall, this examination of literature on the engineering culture presents two interconnected key issues. First, that engineers may feel pressure to conform to the engineering culture or risk not fitting in within their profession and having their sense of belonging contested, which poses issues to EDI in itself as it indicates a lack of inclusivity and discourages diversity of perspectives. This is an issue generally, but is particularly concerning given that it could disproportionately impact minority ethnic students, given the earlier point highlighted regarding their underrepresentation in engineering and their potential subsequent conformity to the culture in order to belong. Secondly, the culture that engineers may feel pressure to conform to appears to pose barriers to EDI, due to the cultural ideologies depicted and how engineers may be socialised to not consider or address social issues, such as social injustices, as they are relegated from the realm of engineering and thus from the concerns of engineers. This could limit the extent to which such EDI issues are recognised or addressed by engineers, thus potentially limiting the progress of EDI. Both these interconnected issues demonstrate issues to EDI individually, but together seemingly result in a reinforcement of the engineering culture and thus a reinforcement of the barriers to EDI that it poses.

This section has discussed ways in which the engineering context at the focus of this research may impact the experiences and perspectives of participants, as well as the progress of EDI. In the next section, I am going to examine literature on race by

introducing Critical Race Theory (CRT), which is important considering that this research focuses on an EDI initiative for minority ethnic students, and therefore literature on race and racism must be considered in relation to the experiences and perspectives of participants, and EDI progress.

3.3 CRITICAL RACE THEORY

The next part of the literature review introduces Critical Race Theory (CRT), as a lens through which dynamics of race, power, and inequality can be examined.

CRT is a body of scholarship that originated in US law schools, to examine the discrimination experienced by Black communities in the criminal justice system, despite having been legally granted equal rights. Despite originating in the US, CRT is believed to be applicable in other contexts. Race theorist Gillborn, for example, claimed, "there is no reason why the conceptual tools and techniques developed by critical race scholars elsewhere cannot be adopted and refined through their application in other nation states". Proving this, CRT has become a significant social theory that has expanded beyond the US to work in European, Australian, South American and African contexts (Rollock & Gillborn, 2011)

In the UK, scholars have demonstrated ways in which CRT can be adapted from US contexts to explain and resist prevalent racism, despite the different history of race and immigration in the UK. For example, Preston's (2008) 'Whiteness and Class in Education' and Hylton et al.'s (2011) Atlantic Crossings: International Dialogues in Critical Race Theory, were some of the first explorations of CRT and education in the UK (Hylton et al., 2011). Later notable UK studies that have employed CRT include Gillborn's work on hidden racism in education reforms (Gillborn, 2013), and Chadderton's work on how minority ethnic young people in secondary schools are constructed as 'threatening' (Chadderton, 2015). Increasingly used in the UK to expose racial power structures, particularly in the sociology of education, CRT is now becoming a key perspective on the policy and practice of race inequality (Rollock & Gillborn, 2011)

Having highlighted the applicability of CRT in various settings and thus to this research, I now provide an overview of CRT and the key ideas that underpin it. CRT offers an understanding of society as shaped by racism, and can be used to examine,

deconstruct, and challenge racial inequality in society. CRT scholars argue that race and racism are the product of social thought and power relations, and that racial injustices are deeply institutionalised in society, maintained by the operation of structures and assumptions that appear normal and nondescript (Rollock & Gillborn, 2011). They acknowledge that there is a dominant culture in Western Society that centres White people and marginalises the voices of racial minorities, where claims of colour-blindness, meritocracy, objectivity, race neutrality and equal opportunity disguise the power, privilege and self-interest of dominant groups (Pawley et al., 2018). The concept of colour-blindness has been argued by CRT scholars as a means to maintain racial segregation without overt racism, as ignoring racial difference serves to maintain and perpetuate racial injustice (Bonilla-Silva, 2017). As put by Gary Olson, "dismissing the importance of race is a way to guarantee that institutionalized and systematic racism continues and even prospers" (Olson, 2003: 211).

There are multiple tenets which are central to CRT:

Centrality of Racism. CRT regards racism as deeply ingrained in society, meaning that it is often viewed as natural and ordinary due to the extent to which it is entrenched in the social order (Delgado & Stefancic, 2001). Racism is not always explicit; its embeddedness in society means that it can operate regardless of intent (Gillborn, 2005; Ladson-Billings, 1998; Rollock & Gillborn, 2011).

White supremacy. CRT views White supremacy as a political, economic and cultural system which normalises White privilege and reinforces racial subordination. Rather than overt acts of racism from extremist groups, CRT views White supremacy as being encompassed within the operations of society as a whole (Rollock & Gillborn, 2011).

Voices of people of colour. CRT places importance on valuing the insights provided by people from minority ethnic backgrounds, on their understanding of being racially minoritised and their reflections on the operation of racism. Whilst CRT does not seek to represent any singular truth through their accounts, racially marginalised individuals are thought to be able to provide insightful contributions due to their position in society (Delgado, 1989).

Interest-convergence. CRT posits that White people are not incentivised to work towards eradicating racism, given that operations of racism serve to reinforce White peoples' positions of power whilst preserving a status quo that is inequitable for racial

minorities (Rollock & Gillborn, 2011). Interest-convergence, however, is a notion referring to how race equality is often advanced when it is in the perceived interests of White people (Bell, 1980). In a study of historical victories for race equality, Delgado and Stefancic found that “sympathy, mercy, and evolving standards of social decency and conscience amounted to little, if anything” in terms of greater race equality, but rather, “advances for blacks always coincided with changing economic conditions and the self-interest of elite Whites” (Delgado & Stefancic, 2001, p. 18). It is argued that advances in race equality such as these, do not tend to create real improvement or sustainable change for minority ethnic groups (Delgado & Stefancic, 2001).

Intersectionality. Intersectionality acknowledges how there are various, intersecting aspects of a person’s identity which shape their experiences and can cause multiple systems of subordination to overlap at one time (Crenshaw, 1989). By adopting an intersectional framework, CRT enables the exploration of differences between and within groups, whilst taking account of structures and relations that maintain inequality (Rollock & Gillborn, 2011).

Having presented this overview of the ideas central to CRT, this literature review now demonstrates how CRT enables the deconstruction of racism and inequities in different contexts. To do so, I draw on an example in which CRT scholars have deconstructed an affirmative action practice, where they criticised the idea of “role models” for minority ethnic groups being provided through affirmative actions (Delgado, 1990; Matsuda, 1988). Affirmative action refers to policies and practices that aim to provide marginalised groups with access to opportunities that historically, they had been denied due to systemic inequalities (Matsuda, 1988). Regarding the idea that people from minority ethnic backgrounds, who assumed roles that had previously been inaccessible to them, provided “role models” to others, CRT scholar Mari Matsuda argued this served as a method of assimilation instead of a way to address historical mistakes (Matsuda, 1988). Delgado, too, argued that the idea of the “role model” makes people from minority ethnic backgrounds adopt majoritarian social norms that imitate oppressive systems of the past (Delgado, 1990). Rather than minority ethnic people being hired due to their skills, Delgado argued that the “role model” argument meant that they would be hired “if you speak politely, have a neat haircut, and above all, can be trusted, not because of your accomplishments, but because of what others think you will do for them” (Delgado, 1990, p. 1226). This example is demonstrative of

the usefulness of policies and practices being deconstructed with a CRT lens, as doing so highlights EDI issues, even within contexts in which the intention is to progress EDI.

As this research examines an EDI initiative implemented for minority ethnic students in engineering, thus far, this literature review has discussed contextually relevant literature on race and engineering that must be considered in relation to the experiences and perspectives of participants. Next, the literature review focuses on efforts to progress EDI.

3.4 EFFORTS TO PROMOTE CHANGE AND IMPROVE EDI

Given that this research sought to examine an EDI initiative that has been implemented, it is important to position this initiative within the wider context of other EDI efforts that have taken place. Despite increasing awareness of impactful practices that have been found to improve the experiences and outcomes of minority ethnic students, limited meaningful progress has been made to the EDI landscape, which raises questions as to why and demonstrates a need to examine EDI efforts. For this reason, the next part of the literature review provides the reader with a background of previous efforts that have aimed to promote change and improve EDI.

Within UK HE, efforts to addressing race inequity for students have consisted of: creating 'space' for students to raise concerns; development of resources to aid in the design of inclusive curricula; equipping students and staff with tools and confidence to discuss race; formal opportunities to develop knowledge in relation to race issues; use of unconscious bias training; use of role models; reverse mentoring; and increased data reporting and monitoring (UniversitiesUK & NUS, 2019). One collaborative UK project led by Kingston University (KCU, 2023) exemplified a successful EDI effort that addressed the institutional culture and promoted the inclusiveness of diverse identities, aiming to decrease the awarding gap for Black and minority ethnic students and provide the sector with systemic change and strategic initiatives through the Value Added (VA) metric and Inclusive Curriculum Framework (ICF). The project intended to move beyond the deficit student model to "effective action and cultural change" by using the VA metric to highlight differences in attainment which could not be explained by student entry qualifications or subject of study, calculating a specific cohort of students' statistically expected percentage of 1st and 2.1 degrees, and comparing them to the actual attainment. A dashboard comparing the VA score produced for

White and ‘BME’ students was claimed to have “proved a very powerful way of engaging staff in constructive discussions about the gap and ways to address it” (KCU, 2023). Furthermore, the ICF integrated inclusivity into each dimension of the student journey, applying a set of principles to ways of learning and teaching that meant that the curriculum was accessible, reflected students’ background and prepared them to positively contribute to a diverse global workforce. The result of these efforts saw the VA score for the partner institutions to have significantly increased between 2016-17 and 2017-18, making the degree attainment of the Black and minority ethnic students at these institutions close to the national average for all students. This project is exemplary of a way in which measurable and long-lasting improvement to EDI can be achieved with commitment and action from the institutions involved.

These examples highlight a multitude of efforts that have attempted to improve EDI for minority ethnic students in HE. Whilst such efforts to address EDI issues for minority ethnic students exist, a large focus of research on EDI efforts appear to be on those implemented for minority ethnic staff, where the disparities detailed previously persist into employment and impact the career progression of minority ethnic groups. During the review of literature, one type of EDI strategy that frequently emerged for staff, but not students, in HEIs was the implementation of specific training programmes. Such training programmes have been found to be beneficial for the career development of minority ethnic staff and it has been argued by Manfredi et al that “there is a need for leadership development programmes at different levels to integrate equality and diversity in their curricula and to encourage future leaders to think how they can make a difference in this area” (Manfredi et al., 2019, p. 10). Examples of such programmes implemented for minority ethnic professionals include: “Elevate” at Exeter University, a leadership and development programme for women from minority ethnic groups, which aimed to be “a safe space where leadership concepts and ideas will be introduced whilst exploring strategies that support the navigation of systemic practices which have tended to historically fix the professional identities of women from minority ethnic backgrounds” (UniversityofExeter, 2023). Another example is the Advance HE “Diversifying Leadership” programme, designed for early career academics, professional services staff, Lecturers and Senior Lecturers from Black, Asian and minority ethnic backgrounds, which explored self-identity, leadership style, motivations and influences, and aimed to create a safe environment for the discussion of lived

experiences of working within HE, to “build confidence, feel empowered and expand their professional strengths” (AdvanceHE, 2019).

Incorporated within the Diversifying Leadership programme was the concept of sponsorship, which relates to previous suggestions within literature to pair senior White leaders with minority ethnic staff (Lumbly and Coleman, 2007). Sponsorship in this programme, saw minority ethnic participants find a senior colleague from within their institution to be their sponsor, a relationship which the programme claimed provided structured support in which the sponsor uses their influence with senior members of staff to advocate for the participant (AdvanceHE, 2020). To date, sponsorship is something that, according to Advance HE, occurs more frequently for (White) men and is far less common in women and people from minority ethnic backgrounds (Advance HE 2020). However, it seems that having a sponsor would be particularly beneficial for minority ethnic groups, given their underrepresentation in leadership positions and historical barriers to career progression. In David Thomas’ three-year study on the career trajectories of minorities at U.S corporations, he found that many high potential minorities became demotivated and discouraged when they failed to be fast tracked in their careers, yet they advanced further in their career when they had sponsors who nurtured their professional development (Thomas, 2001). Furthermore, according to Hewlett (2013), minority employees with sponsors are 65% more likely to be satisfied with their career progression than those without a sponsor, suggesting that sponsorship positively impacted their career progression. Its impact, however, is said to be dependent on a mutual understanding on matters of race, culture and inclusion (Advance HE 2020), where sponsors being able to understand and acknowledge race as a potential barrier is key to the protégé’s success (Thomas 2001).

Some training programmes incorporate coaching dimensions, as coaching has been shown to positively influence career progression (De Vries ,2006). Coaching has been found to elevate underrepresented employees by addressing certain challenges that may specifically impact them, such as an emotional tax from having guardedness against bias, negative effects on their emotional wellbeing due to issues related to inclusion, trust, and job satisfaction, and a potential subsequent disengagement from their organisation (Wilkins, 2020) (Travis & Thorpe-Moscon, 2018). Furthermore, it has been argued that combining coaching programmes with EDI programmes can lead to more long-lasting results, as coaching has the potential to strengthen the elements

necessary for forming inclusive workplace cultures and enhancing employee engagement (Wilkins, 2020).

This review of literature suggests the benefits of training programmes such as leadership development, sponsorship, and coaching in the career progression of minority ethnic groups, yet their usage remains limited for students, raising questions as to why if the benefits are high.

Having reviewed efforts to improve EDI within HE generally, the next part of this literature review discusses literature on such efforts within engineering specifically.

Leadership development opportunities, like those discussed above, may support career progression for engineering students by equipping them with skills beyond the technical focus of the academic curriculum (Rajiyah et al., 2021), helping them become sociotechnical leaders (Didiano et al., 2021). However, initiatives that specifically target leadership development for minority ethnic engineering students remain limited, but certain pedagogies, policies, and practices have been found to help in the recruitment and retainment of minority students (Lichtenstein et al., 2014). For example, positive interactions with academic role models, have been shown to significantly impact minority students' decisions to pursue postgraduate study, as well as their subsequent success (May & Chubin, 2003). Tsui (2010) found that participation in conferences and student organizations helped minorities to find role models and mentors, connect with the engineering profession, and alleviate students' feelings of isolation. In related research focusing on improving minority student outcomes by improving their sense of belonging and self-efficacy, McGill et al (McGill et al., 2018) proposed life coaching as a relatively unexplored, but innovative and promising intervention which may be used in educational settings. These examples highlight ways in which improvements in EDI have been attempted in engineering to date.

Next, this literature review presents potential limitations of EDI efforts that have been implemented in the past. Whilst some efforts such as these have been found to have a positive impact, some types of efforts have received criticism. For example, many of the different interventions that have been implemented to improve diversity have focused on fixing the 'leaky pipeline' (Metcalf, 2010) for example, through the use of quotas. However, these approaches have been criticised for being self-limiting in that they fail to consider the depth and complexity of the experience of individuals and how

patterns of exclusion perpetuate in our culture (Riley et al., 2014). Other types of EDI efforts have been criticised for individualising EDI issues rather than promoting cultural change. For example, AdvanceHE (2019)'s paper, which found that participants experienced racism and discrimination and felt there were 'hidden pathways' for career progression, suggested that programmes targeted at minority ethnic groups may not address structural issues of racism and exclusion in HEIs. . Furthermore, Atadero et al. (2018) critiqued the way in which institutional training programmes can place the burden of change upon minority students and suggested that interventions be aimed at changing the engineering culture by involving all students, as well as focusing on the role of identity development and an appreciation of diversity. Riley et al., (2014) have also been critical of institutional training programmes, arguing that even when marginalised voices are included through such programmes, they often compose of tokenism, compartmentalisation, and the individualisation of barriers. Similarly, Bahnson et al (2021) emphasised the need to focus on the culture rather than the individual, arguing that changing the engineering environment to one that embraces students' backgrounds can motivate students to express their personal and cultural backgrounds in their work. What is clear from these arguments is that these scholars place high importance on addressing the culture, rather than the individuals, in order to make meaningful change. They also emphasise the importance of appreciating and celebrating the diversity of identities, which is significant given how literature on the culture of engineering seems to suggest that the culture represses diversity and instead seemingly reinforces the idea of conformity.

This section of the literature review has examined potential limitations to existing or previous efforts to improve EDI in engineering and could be seen to provide insight into better future courses of action to take to make sustainable improvement to EDI.

3.5 Summary and Research Questions

Overall, this chapter has provided an examination of the literature that informs this research. First of all, I have shown how racial inequalities persist in HE generally and within engineering specifically. Notably, the literature in this area showed that minority ethnic representation in engineering education decreases at each progressive level of study and this underrepresentation persists into employment, which suggests that there are barriers to progression faced by engineers from minority ethnic backgrounds,

signalling persistent EDI issues. With this raising questions as to what causes these issues and how they can be addressed, I examined existing literature on EDI in engineering education and presented key arguments that emerged from previous research, which largely pointed to there being a distinct culture within engineering that posed barriers to EDI. Through an examination of the literature in this area which drew on cultural ideologies and mindsets in engineering, and conformity to these, I presented two key interconnected issues: a) that engineers may feel pressure to conform to the engineering culture or risk not fitting in within their profession and having their sense of belonging contested, which poses issues to EDI in itself, as it indicates a lack of inclusivity and discourages diversity of perspectives. This is particularly concerning given that it could disproportionately impact minority ethnic students; b) the culture that engineers may feel pressure to conform to appears to pose barriers to EDI, due to the cultural ideologies depicted and how engineers may be socialised to not consider or address social issues, such as social injustices, as they are relegated from the realm of engineering and thus from the concerns of engineers. This could limit the extent to which such EDI issues are recognised or addressed by engineers, thus potentially limiting the progress of EDI. Both of these interconnected issues demonstrate issues to EDI individually, but together seemingly result in a reinforcement of the engineering culture and thus a reinforcement of the barriers to EDI that it poses. With knowledge of these potential issues, for this research examining the implementation of an EDI initiative for minority ethnic students in engineering, I have sought to examine the engineering culture within the context of this specific institution, in order to understand the impact it has, if any, on students' experiences and on EDI. Consideration of these ideologies could give meaning to the research participants' understandings of the world and their experiences within it. Additionally, if the need to belong may be particularly strong for minority ethnic students and encourage conformity to this depicted culture, I feel there is a need to examine the experiences of minority ethnic students specifically, in order to gain an intersectional understanding of how their racial identity may impact their experiences in engineering and how they perceive and experience the world generally.

This supports the formation of two research questions:

RQ1: What is the institutional culture at the university?

RQ2: How do participants feel that their racial identity impacts their professional experiences?

Furthermore, in order to examine issues related to race, the next part of the literature review introduced Critical Race Theory (CRT), as a lens through which dynamics of race, power, and inequality can be examined. Demonstrating how a CRT lens can enable the deconstruction of racism and inequities in different contexts, I argue the usefulness of doing so, as it can highlight prevailing EDI issues even within contexts in which the intention has been to improve EDI. With this in mind, it is pertinent to consider CRT in relation to this research's examination of an EDI initiative for minority ethnic students, as it may provide useful tools with which the initiative's capacity to improve EDI can be deconstructed and understood. Furthermore, as CRT is relatively newly used in the UK, there are significant gaps in the research, particularly within UK engineering education context. Therefore, considering CRT in relation to this work would make a beneficial contribution to literature in a UK engineering context.

This supports the formation of the following research questions, as a means of investigating this:

RQ 2: How do participants feel that their racial identity impacts their professional experiences?

RQ 3: What factors led to the course being instigated?

RQ 4: What was the aim of the course?

RQ 5: What were the decision-making processes that took place regarding running the course?

RQ 6: What were the perceived benefits and limitations of the course?

The subsequent part of the literature review provided the reader with a background of previous efforts that have aimed to promote change and improve EDI for race equity within HE and within engineering specifically. Drawing on successful examples of EDI efforts as well as criticisms of certain EDI efforts to date, I highlighted the impetus for improving EDI by both providing training programmes for minority ethnic students, and promoting cultural change instead of focusing on individuals. The understandings that can be gained about effective or ineffective EDI practices by examining EDI efforts are

important to consider when examining the EDI initiative at the focus of this research, within the institutional culture in which it exists, to effectively understand and learn from it. As a pilot course, there are no EDI initiatives exactly the same as the one at the focus of this research, with limited uses of coaching, leadership and sponsorship for minority ethnic students to date. Furthermore, there is little usage of CRT in the discussion of similar programmes. For this reason, this research provides a novel contribution to the field that will help to expand knowledge on and progression of EDI strategies. It aims to explore the decision-making processes that led to the implementation of this course as the chosen EDI initiative to address race inequity, how the experiences and perspectives of minority ethnic students are impacted by their racial identity and the institutional and engineering culture, the impact of the EDI programme, and the extent to which it enabled meaningful and sustainable changes to EDI.

This therefore supports the formation of the following overall research questions:

RQ1: What is the institutional culture at the university?

RQ 2: How do participants feel that their racial identity impacts their professional experiences?

RQ 3: What factors led to the course being instigated?

RQ 4: What was the aim of the course?

RQ 5: What were the decision-making processes that took place regarding running the course?

RQ 6: What were the perceived benefits and limitations of the course?

The following chapter details the methodologies I used to explore these research questions.

4 METHODOLOGY

This chapter provides an overview of the methodologies used in this research. It begins by summarising the research design, the details of which are expanded on later in the chapter. Next is my positionality statement, followed by ethical considerations, both of which help the reader in understanding the factors that have shaped my approach to this research. The data sources are then detailed, including an explanation of the data collection methods used and subsequently, approaches taken for data analyses.

4.1 RESEARCH DESIGN

The main aims of this research were to explore the decision-making processes that led to the implementation of this course as the chosen EDI initiative to address race inequity, how the experiences and perspectives of minority ethnic students are impacted by their racial identity and the institutional and engineering culture, the impact of the EDI programme, and the extent to which it enabled meaningful and sustainable changes to EDI.

The research adopted a qualitative, case-study approach to provide a holistic, rich, contextual insight into the implementation of a EDI programme for minority ethnic engineering doctorate students at the Institution. Case study research, which is ‘a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence’ Robson and McCartan (2016: 150) was useful as ‘a particular representation given in context and understood in that context’ (Thomas, 2011b: 31). I chose to do a case study as, rather than simply answering ‘what’ research questions, case studies help to answer ‘how’ and ‘why’ research questions, and they therefore have the potential to explain or evaluate phenomenon (Yin, 2018), such as the EDI programme at the focus of this research.

Data was obtained from a variety of sources including primary interviews and secondary documentation about the EDI programme and was examined in response to the research questions. Furthermore, the convergence of information from different sources allowed for triangulation (Morgan, 2022) which enhanced the credibility of the findings.

The research questions (RQs) are as follows:

RQ 1. What is the institutional culture at the university?

RQ 2. How do minority ethnic students feel that their racial identity impacts their professional experiences?

RQ 3. What factors led to the course being instigated?

RQ 4. What was the aim of the course?

RQ 5. What were the decision-making processes that took place regarding running the course?

RQ 6. What were the perceived benefits and limitations of the course?

4.2 POSITIONALITY

I am a White postgraduate research student within an Engineering Faculty at the Institution. As a student within the faculty, I was familiar with university processes and several university staff members involved in the EDI programme, making me somewhat of an insider (Greene, 2014). This enabled me access to certain knowledge relevant to this research, such as awareness of who was involved and certain decisions that had been made.

Prior to this role, I completed an undergraduate degree in Sociology at the University of Sussex, during which I conducted research into barriers to accessing and progressing within HE faced by first-generation students. I am passionate about the importance of removing barriers in HE and I am particularly interested in questioning the systemic and institutional structures which reproduce inequality and act as a barrier to social justice.

4.3 ETHICAL CONSIDERATIONS

This study received ethical approval from the College of Engineering Research Ethics and Governance Committee, reference number FB_27-08-21.

For interviews, informed consent was obtained from all participants. Participants were made aware of the purpose of the study, the confidentiality of their data, and that their participation in the research was entirely voluntary, with a right to withdraw at any point up until the anonymisation of transcripts. All identifiable information was removed, and pseudonyms were used when reporting the findings, ensuring confidentiality.

Pseudonyms were generated using an online name generator. Furthermore, with the exception of when participants directly related to their gender identity in a point relevant to the research, I did not refer to gender and instead referred to participants using “they/them” pronouns throughout. This decision was made as I had not collected information in which participants self-identified their gender, and therefore chose not to assume one’s gender pronoun, although I acknowledge that this limits the ability for this research to consider intersectionality.

For course documentation, permission was granted by Damien to use the documentation as part of this research. Confidential information was redacted from the documents and was not used in the analysis. Additionally, identifiable information was removed when reporting the findings so that the information provided could not be linked to specific individuals or organisations.

4.4 DATA SOURCES

As this research sought to gain a comprehensive understanding of the EDI initiative, a case-study approach was used which involved primary and secondary sources of data. I will first describe the secondary data sources.

4.4.1 Secondary data

Secondary data in the form of documentation about the EDI programme is drawn on in this research to help contribute a comprehensive understanding of the initiative. These documents were created prior to the start of the EDI programme, and it was therefore deemed that they could be useful in highlighting the documented aims and objectives of the programme, and enable a comparison between the stated aims, and the outcomes reported in the primary data collected.

Document analysis is deemed a valuable research approach which has been largely underused in qualitative research (Merriam & Tisdell, 2016). However, as is the case in this research, pre-existing data can be a useful triangulation method with other types of data such as interview data (Morgan, 2022). Where interview participants are at risk of being influenced by the researcher, a key benefit that drew me to document analysis is that data is unaffected (Merriam & Tisdell, 2016). I thought this would enable a useful comparison of document data and interview data.

Furthermore, usually with document analysis, researchers should check for authenticity, credibility, representativeness, and meaning when sampling the documents (Morgan, 2022). However, in this research, I did not need to find the secondary data through my own searches, as Damien, a staff member described in section 4.4.2.1, sent me existing documentation about the EDI programme to assist my understanding of the programme upon awareness of the focus of this research. I requested to use these documents to inform this research and permission was granted by Damien to do so. Furthermore, the 'authenticity' and 'credibility' of the documents are assured by my knowledge and trust of Damien, who provided them to me. In terms of 'representativeness', it is acknowledged within literature that assessing the representativeness of an organisation's internal documents can be difficult for researchers, given that the organisation can provide access only to the documents that they want the researcher to investigate (Morgan, 2022; Payne & Payne, 2004). I am aware of the possibility of this case in this research, however, Damien's forthcomingness with participation in this research serves as somewhat of an assurance that they provided me with all of the relevant documents to their knowledge. Nevertheless, I am aware of the possibility that this was not the case and my unfortunate inability to control this if it were true. Lastly, considerations of 'meaning' pertain to whether a document's content is understandable and clear, which, upon assessment, I deemed the documents to be.

The table below details these documents, and the document number that I assigned to it. When drawing on different documents in the Findings, I refer to each one using its corresponding number, i.e. "[1]".

Table 1: Description of documentation

Document number	Creator of the document	Overview
1	The Institution	A document from the Institution requesting proposals for a leadership development programme for the procurement process.
2	The Institution	A document from the Institution requesting proposals for a coaching programme for the procurement process.
3	The external, procured provider of leadership development programme.	The proposal for the leadership development programme from the external, procured provider.
4	The external, procured provider of coaching programme.	The proposal for a coaching programme from the external, procured provider.
5	The Institution	An email sent by staff member Damien (see 4.4.2.1) to postgraduate students, informing them of the opportunity of the EDI programme and how to apply.
6	The Institution	A PDF attachment to email [5], with more information about the EDI programme.
7	The procured provider of the leadership development programme	Presentation slides by Joanne (see 4.4.2.1) used for the 'Sponsor briefing' session to inform sponsors about their role.

4.4.2 Primary data

Primary data was collected in the form of semi-structured interviews, using a purposive sampling method (Bryman, 2015) from a range of stakeholders involved in the EDI initiative. These were: students who participated in the EDI initiative, university staff members involved in decisions about the initiative, university staff members who acted as sponsors, and the external providers who delivered the initiative.

Different forms of primary data collection methods were considered before deciding on semi-structured interviews. As one of the aims of this research was to gain an in-depth insight into the research participants' experiences and perspectives, I felt methods such as surveys would not effectively capture these. I therefore decided that one-to-one interviews would best elicit the in-depth level of data desired, particularly given Atkinson's (2010)argument that the reality of one's experiences can be understood best by the reflections and individual subjective processes revealed in semi-structured interviews.

Thus, a semi-structured interview protocol was developed to ensure coverage of key research questions and concepts identified in the literature, but also allowed the opportunity to guide the discussion in directions that had not previously been considered and/or that were interpreted as meaningful for the interviewee. I was not expecting a consensus amongst the different stakeholders in their interviews, rather, it was expected that stakeholders' perspectives on the course could differ, something which I felt could provide useful insights in itself. Examining different perspectives in this way does, however, present difficulties in how to present them logically.

As an overview of the primary data collection process that applied to all stakeholders, each participant who expressed interest in taking part in the research were sent the participant information sheet and consent form and asked to return the signed forms confirming their informed consent to participation prior to the commencement of the interview. Depending on the participants' preference, the interviews took place via Zoom or face-to-to face in a privately booked room on the university campus. Each interview took place between the months of October 2021 and April 2022, depending on participants' availability, and lasted up to 90 minutes. It was hoped that being in a familiar environment and private setting of their choice would ensure that the location chosen by the participants was the most non-disruptive and comfortable location for

them, to enable them to feel at ease to have in-depth discussions. With the participants' consent, all interviews were audio or video recorded using the "record" feature on Zoom, even for the participants whose interviews were face-to-face. This was to ensure consistency in the recording of the interviews.

In the following pages, I have provided an explanation of the sampling and data collection process specific to each group of stakeholders, with each group presented under separate headings.

4.4.2.1 University staff members involved in decisions about the EDI programme

Table 2 *University staff members*

Participant	Position	Minority ethnic background?
Declan	Senior staff member in CDT	No
Damien	Staff member in CDT	No
Yara	Staff member involved in the 'BAME Students in Engineering Network'	Yes
Michael	Senior staff member in another CDT	No

There were three key university staff members involved in the instigation and implementation of this EDI programme: Declan, Damien and Yara. As a student insider (Holmes, 2020), I was aware of the identity of these staff members. Given that I wanted to gain a holistic understanding of the EDI programme, I felt that it was important to interview these staff members to understand the impetus for, and decision-making processes surrounding the implementation of the programme, and to provide insight into the institutional background. I therefore contacted them directly by email, introducing the research and its objectives, and all three agreed to be interviewed.

The interview schedules for these staff members contained questions that related to their awareness of EDI issues, their impetus to implement the EDI programme, their decision-making processes surrounding the course, and their overall reflections on the course. These questions pertained to RQ 1,3, 4, 5 and 6.

A fourth member of staff at the university, Michael, a senior staff member from another CDT, had, according to an account by Damien (see 5.2), been offered places on the

programme for students in their CDT, but refused the offer. I thought it would be insightful to interview Michael in order to understand their perception of the programme and why they refused it. It was hoped that this would provide more of an insight into the general opinions about such EDI initiatives amongst senior staff members at the university. Michael was contacted by my primary supervisor, who was familiar with them, introducing me and the objectives of the project to them. They agreed to an interview, and I followed up with more information about the research. Whilst Michael did not have any involvement in the implementation of the course, as a data source, they have been included within the university staff members section, given that they add to the understanding of the institutional background.

Michael was interviewed about their position within the university and their understanding and perception of the EDI initiative at the focus of this research. These questions pertained to RQ 1 and 6.

4.4.2.2 University staff members who became sponsors

Table 3: *Sponsors*

Participant	Position	Minority ethnic background?
Aran	Senior academic	Yes
Martin	Senior staff member	No
Declan	Senior staff member	No

There were six senior staff members in leadership and management positions at the Institution, who took on the role of sponsors as part of the leadership side of the programme. I wanted to gain an insight into the circumstances in which they were asked to become sponsor, their interpretation of what the role entailed, and their views on the experience. One of the sponsors was a university staff member involved in the decisions regarding the EDI initiative, and for this reason, they provided information on that aspect of the EDI initiative and were not used as a data source to examine sponsorship. The remaining five sponsors were unknown to me, and Damien, who was familiar with the sponsors, therefore contacted the sponsors by email to introduce the research, copying me in, to which I responded with further information. Only one sponsor agreed to take part in the research at that point. Following this, I proceeded to follow up with the sponsors and email each person individually. This resulted in one more sponsor agreeing to take part.

For the two sponsors, the interview schedules focused on questions about how and why they became involved as a sponsor, their awareness of EDI issues, their experiences of being a sponsor, and reflections on the process. These questions pertained to RQ 1,4,5 and 6.

4.4.2.3 Facilitators of the programme

Participants	Position	Minority ethnic background?
Joanne	Procured, external facilitator for leadership development sessions	Yes
Jessica	Procured, external facilitator for coaching sessions	Yes

There were two external providers who delivered the EDI programme. Both providers were minority ethnic, one of whom delivered coaching sessions, and the other of whom delivered the leadership sessions and led the sponsorship guidance. I wanted to interview these providers to gain a more complete understanding of their approach, the process in which they came to deliver the course, and their reflections on the delivery and impact of course. I had already previously met the providers one time at the university, and I therefore contacted them directly, one by email and the other via LinkedIn. Both were forthcoming with participating in this research. I then followed up with an email with more information about the research project and both agreed to take part.

The interview schedules for the programme facilitators focused on questions relating to how they became involved in delivering the course for the Institution, the approach used, and their reflections on the course. These questions pertained to the following three research questions: RQ 4, 5 and 6.

4.4.2.4 Students who participated in the EDI programme

Whilst there were eight attendees of the EDI initiative overall, one was a member of staff who was not included in the sample, given its focus on students. I was not familiar with the students who took part in the EDI initiative, and for this reason, Damien sent emails to the seven remaining students, introducing me and the aims and objectives of the research project. It was hoped that being contacted by Damien as an insider (Holmes, 2020) who was already familiar with these students would encourage the students to take part. I then followed up with an email with more information about the research project. However, I did not want the students to feel compelled to take part if they did not want to, and I was aware of how my position as an insider as part of the faculty, and Damien's position as another insider, risked making students feel pressured to participate. I therefore tried to reduce this by emphasising the voluntary nature of their participation, as detailed in the Ethical Considerations. To the emails sent by Damien and I, one of the seven students did not reply. Of the remaining students, six identified as minority ethnic and one was White. All seven agreed to take part in the research. As the focus of this research was minority ethnic students, there was a decision to be made as to whether to include the White student within the sample. However, the inclusion of the student was deemed a way in which to gauge the usefulness of such an initiative to other students.

Seven students in total were interviewed and were asked questions relating to their experience in their postgraduate engineering education, their identity, perceived barriers to progression, and their experiences and reflections on the EDI programme. These interview schedules pertained to RQ 1,2,4,5, and 6.

During the interview process, I was conscious of the dynamics of power and how my position as an interviewer could result in dominance of discursive power (Karnieli-Miller et al., 2009).This was less of a concern for interviews with university staff members, sponsors, and the programme facilitators, given the power they held as professionals in senior positions, compared with myself as a student. However, the EDI programme participants and I were both students and I was therefore highly conscious of how my position as the interview disrupted the power balance. In addition to my position as the interviewer, I was aware of how an interviewer's ethnicity, social class, sex, or age amongst other characteristics can influence how participants answered research questions (Waterfield, 2018). Whilst I was in some ways an "insider" to the participant population as a fellow student in the same Faculty, I am not an engineering student and I am not from a minority ethnic background, which positioned me as an "outsider" to the participant population in these ways. I was therefore conscious of how marginalised groups sometimes distrust interviewers due to concerns that research findings might be harmful or useless to their communities (Ellard-Gray et al., 2015) and this influenced the design of the interview schedule, as I attempted to build rapport with participants and ease into the interview process to build trust before asking questions that elicited personal information. I also hoped that the power imbalance would be minimised by asking participants open-ended questions which promoted the participants voice and better enabled them to guide the discussion in the way they chose.

Table 4: *Students who participated in the EDI programme*

Participant	Position	Minority ethnic background?	Born in the UK?	Experience in industry?
Elijah	EngD student	Yes	No	No
Eric	EngD student	Yes	No	Yes
Ayaan	EngD student	Yes	No	Yes
Madeleine	EngD student	Yes	Yes	No
Rhea	EngD student	Yes	No	No
Wren	EngD student	No	Yes	No

4.5 DATA ANALYSIS

In this section, I detail the data analysis methods for both the primary data obtained from interviews, and the secondary data obtained from existing documentation. For both, I take a thematic approach to analysis (Braun & Clarke, 2012; Morgan, 2022). Whilst it is expected that no two researchers will produce the same codes, given that codes represent the researcher's interpretations of patterns of meaning within datasets (Byrne, 2022), I detail my approach to data analysis to enable transparency of the process.

4.5.1 Primary data analysis

I began familiarisation with interview data by listening to each interview recording and engaging in active listening, during which no notes or transcriptions were made, to ensure full focus on the recording. For the student participants of the EDI programme, manual transcription of the interview recordings began after listening to each recording once. This was a time-consuming process and for that reason, the remaining interview recordings of the other datasets were transcribed by a transcription company, due to the time constraints of the research.

In the first phase of data analysis, I continued familiarisation with the data by thoroughly and mindfully reviewing each interview transcript, initially making no notes to enable full absorption of the data. Following this, I re-read each transcript multiple times. At the end, I made a few notes about what stood out as particularly significant. This phase aimed to ensure a comprehensive understanding of the data.

Next, I started a semantic coding process (Byrne, 2022), where I began to assign descriptive codes to parts of the text that represented the "explicit or surface meanings of the data" as conveyed by the participants (Byrne, 2022, p. 7). To do so, I used the 'comments' function in Microsoft Word, which highlighted the area of text assigned to a code and enabled the code to be noted in the side margin of the document. As an example of the coding process at this stage, if a participant said there was an inclusive culture at the university, I would code "inclusive culture", and if they said that their confidence had increased, I would code "increased confidence". As demonstrated, codes were as brief as possible whilst ensuring adequate detail (Braun & Clarke, 2012). The process of code-generation at this point was non-prescriptive regarding the number and type of codes identified from an item of data, which resulted in an abundance of initial codes. However, at this stage, I did not want to let the coding process be steered by awareness of previous research in order to enable a more inductive, data-driven approach (Braun & Clarke, 2013). No deeper interpretation influenced the coding, and no linkage was made between codes, as I wanted to remain open to the meanings constructed and communicated by my participants (Charmaz, 2004).

In order to keep track of the codes effectively and aid transparency (Byrne, 2022), I created a document that resembled the Framework approach to thematic analysis, described as a matrix based method for ordering and synthesising data (Ritchie et al., 2003) that provided a way of thinking about how to manage data and themes. In a table on Microsoft Word, I added all participants into separate rows, and all codes into separate columns, and marked in each cell where a code had been assigned within a participant's transcript, with the exemplary excerpt(s) from the text. This enabled me to examine codes with similarities to others in terms of their underlying concepts, as certain semantic codes appeared to pertain to the same ideas as others. In this phase, I had still wanted any new iterations of codes to be developed without the influence of my existing knowledge or preconceptions on the coding process in order to enable an

inductive generation of codes that represented the data as neutrally as possible (Braun & Clarke, 2013). This was because I was conscious of the possibility that coding with theoretical ideas or research objectives in mind could cloud my interpretation of the data and result in me not picking up on something significant within the data. Despite the extent to which I aimed to avoid influencing the data, however, I was aware of my active participation in construing the relationship amongst different codes and that "themes do not reside in the data waiting to be found" (Byrne, 2022, p. 13).

I proceeded to review the table of initial codes and created new iterations of codes that collapsed "multiple codes that share a similar underlying concept or feature of the data into one single code" (Byrne, 2022, p. 13). For example, one participant said that "a lot of self-reflection is needed if you're going to be a successful leader. To have a kind of, not an insular view. To understand how you're received" (Excerpt A). In the initial open coding phase, this was coded as "the need for self-reflection", as a descriptive code derived from the words of the participant. Another participant said that they needed to ask themselves, "do I behave right, or do I communicate right?" (Excerpt B). This was initially coded as "the need to question behaviour and communication" in the semantic phase of coding. However, in this stage of coding, I interpreted the Excerpt B as an act of self-reflection, and therefore coded it as such. This grouped Excerpt A and Excerpt B, which had previously been represented by different codes, together under the same code, "the need for self-reflection". Through reviewing the data and initial codes again in this way and questioning how expressions were different or similar to the other (Ryan & Bernard, 2003), I had generated a new iteration of codes in which multiple codes with shared meanings were reduced into one representative code, significantly reducing the number of codes that I had. Codes that had only been assigned to one aspect of the data remained in the successive iteration of codes at this point, as I did not want to discount the potential of their contribution merely because they only represented one individual's subjective reflections or meaning making. Whilst "topics that occur and reoccur" (Bogdan and Taylor 1975:83) could indicate significance amongst participants, individual meanings made and communicated can be equally (and sometimes even more so) significant than frequencies. However, this method meant that I still had a multitude of codes that needed to be refined, many of which I knew would bear no relevance to the research. I recorded the successive codes, and highlighted the codes that had changed within this new iteration to aid my tracking of

the code development. However, I next needed to identify patterns of codes and data items that communicated something meaningful to help answer the research questions (Braun & Clarke, 2013).

In the next stage, after having reviewed the transcripts and codes multiple more times and confident that I had coded data that represented the meaning making and perspectives of the participants without steering it to my objectives, I reviewed the transcripts and the codes once again with the research questions and contextual information in mind this time. This would enable me to start the process of narrowing down the data to what was relevant to my research. Reviewing existing codes again, I continuously referred back to the transcripts to consider the context in which the coded data emerged within. To exemplify, I draw again on the Excerpt A and B. When reviewing the transcripts to consider the context of these codes, both excerpts came from the participants' discussions of what they had gained from the EDI programme. Of course, given that the interviews were guided by the interview schedule, it would be expected that many points of discussion were the same across datasets. However, given the nature of semi-structured interviews, participants were able to steer the discussion into certain directions, and when commonalities occurred in these instances, it was of particularly interest to me as it indicated points of shared significance amongst participants. In this case, the recurrence of "the need for self-reflection" code highlighted shared significance amongst the participants. Then, consideration of its frequency within the context in which it emerged (discussions of what they had gained from the EDI programme) indicated that this was a takeaway of the EDI programme for the participants. Considering the coded data in context therefore enabled me to build my understanding of participants' perspectives and meaning making in relation to different topics. It also enabled me to begin to connect the data with the research questions that I sought to answer. For example, "the need for self-reflection", when coded within the context of it being a perceived positive takeaway from the EDI programme, could inform the response to RQ 6, "what were the perceived benefits and limitations of the EDI programme?". I therefore started to label the codes developed in this stage with the number of the research question that I felt they pertained to. This resulted in a refined set of codes which contributed to contextual understandings of the data.

Next, I had to make a difficult decision. I had wanted to go on to latently code the data in a creative and interpretive way (Braun & Clarke, 2012; Byrne, 2022), to interpret underlying codes and themes that spanned the datasets without the connection of a particular topic or context. With the level of familiarisation with the data that I had gained throughout coding stages thus far, I had begun to notice certain commonalities that stood out to me as potential themes, deriving from both frequencies in the data, and infrequencies in the data, where I was "alert to topics that your subjects either intentionally or unintentionally avoid" (p. 82) as described by Bogdan and Taylor (1975). For example, I noticed that the students who participated in the EDI programme had a largely positive and uncritical outlook, which meant that they often had very little to say about EDI issues. The extent to which critical engagement was avoided by students, "intentionally or unintentionally" (p.82), stood out to me as a possible theme. As another example, a lack of institutional support stood out to me as another potential theme, based largely on the frequent inconsistencies in the understandings and actions of university staff members and sponsors involved in the EDI programme. However, whilst certain commonalities across the datasets such as these could have potentially led to the formation of creative themes, I was conscious that presenting the findings under such critically interpretive themes could cloud the reader's understanding of the EDI programme. Given that this research sought to provide an understanding of the EDI programme and its impact, I felt that the themes generated needed to clearly represent the data within the context it pertained to. I therefore decided to group the codes into themes that would be classed more as "domain summaries", which are described by Braun and Clarke as "summaries of what participants said in relation to a particular topic or data collection question" (2019, p. 5), as this would enable me to clearly present the findings under the research questions that they pertained to and facilitate a cross-dataset comparison of findings. Bryman (2015) asserted that a theme can be many things, including that which relates to the research focus and research questions, which supported my decision. This stage of theme generation therefore shifted my focus from the interpretation of individual data to the interpretation of a collection of meanings across the dataset (Byrne, 2022), during which I reviewed and analysed codes to see how different codes could combine into shared meanings that formed responses to the research question(s) as themes. The theme generation was not solely dependent on the amount of codes that informed it, but whether the pattern of codes conveyed meaningful findings that helped to answer

the research questions (Braun & Clarke, 2013). This meant that I had to let go of codes that did not fit within the overall analysis. It also meant that I had to let go of prospective creative and interpretive themes. However, I instead drew on these points within the Discussion chapter, where I was able to expand on my interpretations in a deeper sense by relating themes to existing literature and theoretical ideas that had not formed the coding or theme creation process. This enabled me to deepen the understandings provided of the research participants' experiences.

Overall, the process of coding and theme development evolved throughout the analytical process (Byrne, 2022). Throughout the entire data analysis process, I recorded my thoughts and considerations about the data in a reflexive journal to remain conscious of my influence as a researcher on data interpretation and ensure transparency (Braun & Clarke, 2013).

4.5.2 Secondary data analysis

Due to the versatility of thematic analysis and how it does not have one theoretically driven approach or prescription of epistemological or ontological frameworks (Braun & Clarke, 2013), it is deemed an ideal method in document analysis (Morgan, 2022). I therefore utilised this approach for my secondary data analysis of documentation about the EDI programme.

In the first phase of data analysis, I began familiarisation with the documentation about the EDI programme by thoroughly and mindfully reviewing each document, initially making no notes to enable full absorption of the data. Following this, I re-read each document multiple times. This phase aimed to ensure a comprehensive understanding of the data.

Next, I started a process of simultaneous semantic and latent coding (Byrne, 2022), where I began to assign descriptive codes to parts of the text that represented the "explicit or surface meanings of the data" (Byrne, 2022, p. 7), whilst also coding "hidden meanings or underlying assumptions, ideas or ideologies that may shape or inform the descriptive or semantic content of the data" (Byrne, 2022, p. 7). To do so, I used the 'comments' function in Microsoft Word, which highlighted the area of text assigned to a code and enabled the code to be noted in the side margin of the document. Or, if it was a PDF, I used the 'comments' feature of Adobe Acrobat, which also highlighted the area of text assigned to a code and enabled the code to be noted in the side margin

of the document. Codes were as brief as possible whilst ensuring adequate detail (Braun & Clarke, 2012). Whilst I did not want to allow the coding process to be steered by awareness of previous research in order to enable a more inductive, data-driven approach (Braun & Clarke, 2013), I remained mindful of the wider context and research questions during this stage of coding. I felt that this was important to ensure that the coding was directed towards addressing my research questions. One contextual consideration when coding was of who created each document: the Institution, the coaching provider, or the leadership provider? This was significant as each document provided insights into the viewpoints of the document creator. However, given that these were secondary data sources rather than, for example, primary interviews, I did not have the concern of preserving the individual voices or meaning-making of participants when coding. In interviews, coding with certain objectives in mind in the initial stage of coding could risk potentially overlooking a significant point raised by a participant (Braun & Clarke, 2006). However, in the case of secondary documents such as these, whilst they may represent the views of the document creator, they serve as informative rather than reflective sources that had not been involved meaning-making for the purposes answering the questions of this research. As a result, coding with the context and research questions in mind was justified, as it enabled me to identify points directly relevant to my research questions (Braun & Clarke, 2013).

Furthermore, I did not place a limit on the number or type of codes that could be identified from an item of data, and therefore many items of data were assigned multiple codes, resulting in an abundance of initial codes. For example, “create an ‘I Can Do’ mind-set that will bring about greater productivity and profit” is an excerpt from document (4), created by the coaching provider, that was coded in multiple ways. It was coded semantically as “aim of creating a positive mindset” and “aim of improving productivity” and “aim of increasing profit”. Semantic coding was useful in this way as it generated codes which individually represented different focuses and aims of the coaching sessions as depicted by the provider, which aided my objective of providing an understanding of the EDI programme. Latent coding was useful in highlighting the underlying assumptions that informed the EDI programme. For example, latent coding of the same excerpt brought about codes such as “assumes participants lack a positive/ motivated mindset”, “assumes lack of productivity and profit is due to individual mindset issues”, “implies blame on the individual”. Not only does this speak

to the underlying assumptions of the provider as the creator of the document, but it could also speak to the assumptions of CDT/ the Institution, given that the proposal in this document was created to meet the objectives set out by CDT. I repeated this coding phase multiple times whilst re-examining the documents and finalised a list of initial codes.

This initial list of codes was extensive and I next needed to identify patterns of codes and data items that communicated something meaningful to help answer the research questions (Braun & Clarke, 2013). In the next stage of the coding, I collapsed "multiple codes that share a similar underlying concept or feature of the data into one single code" (Byrne, 2022, p. 13) which enabled me to highlight commonalities amongst different documents, whilst reducing the number of codes. Codes that had only been assigned to one item of the data remained in the successive iteration of codes, as I did not want to discount the potential of their contribution to answering the research question(s) merely because they only represented one item of data. In fact, they were particularly useful in highlighting differences amongst the documents, whilst the codes that represented multiple items of data enabled me to see patterns in the data and how they pertained to my research questions. The patterns of semantic codes were particularly useful in helping to answer RQ 4 as they clearly depicted stated aims and content of the course. The patterns in latent codes were useful in building a picture of the background to the EDI programme and thus spoke particularly to RQ 1. For example, latent coding that brought to light the objectives that the CDT sought for their students, and thus what issues they thought they needed to address for their students to improve EDI, provided an insight into an aspect of the institutional culture (RQ 1). Of course, the semantic and latent codes overlapped, too. At this stage, I recorded the successive codes, and highlighted the codes that had changed within this new iteration to aid my tracking of the code development and transparency of the process (Byrne, 2022).

I next focused on deciding how to group the codes to answer the research questions in the write up of this report. Whilst certain commonalities across the datasets such as these could have potentially led to the formation of creative themes, I was conscious that presenting the findings under such critically interpretive themes could cloud the reader's understanding of the EDI programme. Given that this research sought to provide an understanding of the EDI programme and its impact, I felt that the themes

generated needed to clearly represent the data within the context it related to. I therefore decided to group the codes into the research questions that they pertained to. I thought this would best facilitate a cross-dataset comparison of findings, with the interview data presented in the same way. Bryman (2015) asserted that a theme can be many things, including that which relates to the research focus and research questions, which supported my decision. This stage of theme generation therefore shifted my focus from the interpretation of individual data to the interpretation of a collection of meanings across the dataset (Byrne, 2022), during which I reviewed and analysed codes to see how different codes could combine into shared meanings that formed responses to the research question(s) as themes. The theme generation was not solely dependent on the amount of codes that informed it, but whether the pattern of codes conveyed meaningful findings that helped to answer the research questions (Braun & Clarke, 2013). This meant that I had to let go of codes that did not fit within the overall analysis. It also meant that I had to let go of prospective creative and interpretive themes. However, I instead drew on these critically interpretive points within the Discussion chapter, where I was able to expand on my interpretations in a deeper sense by relating themes to existing literature and theoretical ideas, and draw comparisons between the primary and secondary dataset findings. This enabled me to present a fuller understanding of the programme and contextualise the participants' experiences found in the primary data.

Overall, the process of coding and theme development evolved throughout the analytical process (Byrne, 2022). Throughout the entire data analysis process, I recorded my thoughts and considerations about the data in a reflexive journal to remain conscious of my influence as a researcher on data interpretation and ensure transparency (Braun & Clarke, 2013)

4.6 LIMITATIONS

Whilst this research has provided valuable insights into the implementation of the EDI programme and the wider context in which it exists, it is important to acknowledge the limitations that may have impacted the findings.

It could be viewed as a limitation that the case study approach used provided detail into a specific case but is not generalisable to a larger population. However, generalisability was not the intention of this research and with the small sample size

within the specific case examined, the research questions were sufficiently answered. What is more, Yin (2018) argues that the findings of case study research can become analytically generalisable if findings are connected to a wider set of theoretical ideas, something which I did within the Discussion chapter. Whilst the research did not seek to be generalisable, through linking the findings with existing literature, the research findings were able to be situated within the wider context and thus made analytically generalisable (Yin, 2018).

Another potential limitation to consider is that the EDI programme participants had, up to this point, been successful in their engineering journey, having secured funding to study towards a doctorate qualification, and it is unclear whether the initiative described would have had similar outcomes for minority ethnic students who had not reached such high levels of achievement.

Furthermore, the findings from the EDI programme participants are based on self-reported data from interviews that took place only a short time after the course had finished and I am therefore unable to provide any information pertaining to the long-term impacts of the intervention.

5 FINDINGS

In this chapter, the findings of each dataset are presented separately, beginning with secondary documentation about the EDI programme, as it was deemed that presenting these findings first would assist the reader's understanding of the overall findings, given that the EDI programme documentation is explanatory of many details about the programme's objectives. Following the documentation findings, the interview data findings are presented, starting with the university staff members dataset, followed by sponsor findings, then programme facilitator findings, and finally the findings of the students who participated in the EDI programme. It was decided that the findings from these datasets would be presented prior to the EDI programme participant findings, as they provide the reader with additional background information regarding the institutional context and the implementation of the programme that would be useful for the reader's contextualisation of the EDI programme participant findings. Furthermore, within each section for the different datasets, the findings are presented under the research questions that they pertain to as the themes. Not all datasets pertain to every research question, and for that reason, each set of findings will only refer to research questions relevant to that specific dataset. Moreover, the reader should expect to find only an overview of the findings in this section, as the critical discussion of the key findings occurs in the subsequent chapter.

5.1 EDI PROGRAMME DOCUMENTATION

Analysis of the EDI programme documentation provides insights related to two research questions: RQ4, "what was the aim of the course?", and RQ5, "what were the decision-making processes that took place regarding running the course?".

RQ4. What was the aim of the course?

The CDT's aim was stated as being to implement a programme for "BAME doctoral students" [1] [2], which sought to address the issue of there being disparities in the experiences of minority ethnic individuals and White individuals in the workplace, whereby "BAME individuals in the UK are both less likely to get in and get on in the workplace compared to their White counterparts" [1] [2]. By implementing this leadership and coaching programme, the CDT wanted to "educate them and afford them with the skills to excel in their careers and climb the ladder into leadership roles"

[1] [2]. The CDT aimed to do this through covering the following syllabus in the leadership training programme “what are the criteria of a good leader?”, “barriers to becoming a leader for BAME”, “overcoming these barriers”, “role of sponsorship and coaching”, and “achieving your career goals” [1]. In addition to this, CDT wanted the coaching programme to “compliment” the leadership training through one-to-one sessions that aimed to “empower the individuals to realise and achieve their long-term objectives” [2]. In these coaching sessions, the CDT specifically wanted there to be an objective of “increasing self-awareness to identify strengths and areas for improvement”, “building confidence and resilience to overcome obstacles” and “identifying and achieving career goals” [2].

Based on the requirements depicted in the CDT’s request for proposals, and combined with their own expertise, the leadership and coaching providers each provided a proposal that depicted their approach and aims. Acknowledging there to be “systemic barriers that impede success of underrepresented groups” [3], the leadership programme proposal criticised programmes designed to “fix” the individual, and instead aimed to operate at “individual, group and organisational levels”, in order to bring “sustainable outcomes” [3]. The proposed way of achieving this was through: group sessions “to explore, develop, articulate and exploit leadership capital”, formal sponsorship of participants by “senior leaders” at the university [3], and through coaching sessions delivered separately, but in connection to the leadership programme. Given that leadership programmes for minority ethnic individuals “can often open up deep-rooted issues, challenges and opportunities” [3], the coaching is claimed to enable the participants to “explore emerging professional and personal issues in greater depth” [3].

Furthermore, the sponsorship aspect, embedded within leadership side of the course, aimed to address issues such as “affinity bias” and “stereotyping” impacting the career progression of minority ethnic employees [7], by creating a “two-way relationship” in which the sponsor and participant positively impact each other. The aim of the sponsor’s role specifically was to provide “active support” to the participant as someone “in their field” with “significant influence on decision-making processes or structures” [3]. The role required sponsors to be “advocating for, protecting, and fighting for the career advancement of an individual” [3], as well as to “commit to having conversations that matter”, such as “colour brave” conversations about race [7].

The aims of the programme in terms of the impact on the university were also listed, which included a “greater awareness of systemic barriers in institution”, the demonstration of “commitment at a senior level”, an “increased awareness of informal barriers (e.g. bias, cultural exclusion)”, “contribution to a culture change” and “evidence for Race Equality Charter” [3].

The purpose of the coaching programme, as depicted in the proposal [4], was to improve the “skills” and “mindset” of participants to enable them to “operate at a higher level” [4]. The proposal claimed that “seeking new opportunities to raise your standards is of the utmost importance” given the competitive global marketplace and is therefore designed to raise “people management skills”, “morale”, “combat negativity”, “build confidence” and “create an ‘I Can Do’ mind-set” to “bring about greater productivity and profit”. The overall result intended was that “commitment, accountability, ownership and consistency” would be embedded within the participants [4].

The EDI programme was advertised to prospective participants as a programme that aimed to provide “long-term vision”, “clarity” and “confidence” to “enhance participant motivation and engagement in their EngD” [5] [6]. Through the coaching aspect specifically, the stated outcomes were the following:

- “Take ownership of career and life aspirations through individual coaching
    - Self - awareness - Identify strengths and areas to improve
    - Self-discovery –discover one's values, beliefs and life purpose
    - Self-mastery – building confidence and resilience” [5] [6].

Furthermore, the stated outcomes for the leadership development aspect specifically were as follows:

- “Explore concepts of leadership in the context of life and career ambitions
    - Understand leadership, power, influence and organisations
    - Appreciate the role of privilege in creating racial advantage as well as disadvantage in institutions
    - Identify and exploit advantages due to cultural diversity and cultural identity
    - Develop strategies to fulfil career progression even in the face of resistance, bias and overt racism

- Understand the role and responsibilities of in sponsor / protégé relationship
- Exploit career progression / leadership opportunities at [The Institution] and elsewhere" [5] [6].

RQ. 5 What were the decision-making processes that took place regarding running the course?

As detailed in the previous section, the decisions made with respect to the content of the course appeared to be guided by the requirements of the CDT set out in the request for proposals [1]. In line with these requirements, the providers each submitted a proposal detailing a plan for the course, which they described as "tailor-made" [3] [4] for the students. Upon approval by the CDT, the specific course content was prepared by the providers, informed by their expertise [3] [4]. One key element of the leadership side of the programme that was included due to the decision of the provider was sponsorship. The provider stated that sponsorship was "embedded" within the leadership programme due to its "importance" and "benefits" for "underrepresented groups" and the lack of awareness surrounding this [3].

Furthermore, it appears that the number and duration of sessions was also decided by the CDT given that the CDT request for proposals document stipulated the following: "3 days (up to 7 hours/day) – can be spread out across numerous weeks" for the leadership side of the programme, and "spread over a 3 month period" for the coaching side of the programme, with the timing for both to be "run between October 2020 and March 2021" for maximum of 10 participants [1] [2].

5.2 UNIVERSITY STAFF MEMBERS

Analysis of the university staff members findings provides insights related to two research questions: RQ4, "what was the aim of the course?", and RQ5, "what were the decision-making processes that took place regarding running the course?".

RQ1: What is the institutional culture at the university?

The institutional culture at the Institution was examined through interviews conducted with the university staff members involved in the implementation of the EDI programme. The findings shed light on the values and atmosphere at the university.

One of the key things that shed light on the institutional culture was their views on EDI. Staff awareness of EDI issues can significantly contribute to the institutional culture as the awareness of staff has the power to shape the environment and practices within the university (Tierney & Lanford, 2018). For the CDT staff involved in the implementation of the EDI programme, awareness of EDI issues appeared to have been somewhat limited to the gender disparities within engineering. Declan and Damien discussed several of the CDT's efforts to address gender equality issues and that the CDT had achieved a 50:50 ratio of male and female students in their CDT that year, which had resulted in the CDT being "praised for the efforts trying to get gender balance brought in" (Damien) in a project evaluation. Both Damien and Declan admitted, however, that they had limited awareness of EDI issues other than gender. Declan claimed they had been "mainly focused on male to female ratios" and that they had not been "as aware" of EDI issues regarding race but had known that the university was "part of some race charter". Similarly, Damien claimed that they had not been "fully versed" in barriers to progression for minority ethnic groups.

Yara on the other hand, had actively been aware of, and advocated, for the improvement of EDI for minority ethnic students. Critical of the university's primary focus on improving gender equity, Yara claimed to have repeatedly felt a "punch in my stomach" upon frequently hearing discussions focusing on improving EDI for women, when concern was not extended to the barriers facing people from minority ethnic backgrounds, as Yara felt that there were "other realities in science that we don't speak of".

Yara's reflections suggest that the culture within engineering contributes to the lack of awareness about EDI issues. For example, Yara explained how they had created the BAME society in Engineering to "inspire, empower and educate", but alluded to difficulties to do this due to the STEM environment, claiming that people in STEM were sometimes "not very sympathetic or empathetic" and could not "see the reality" of barriers to EDI. Yara's perception guided decisions made in EDI awareness-raising events, as Yara felt the STEM audience would "resonate" more with "facts and numbers" than "if we just say there is discrimination and then just speak about it or emotions get involved". As a result, Yara "mindfully" chose an academic speaker at an EDI event, as Yara felt this person was someone "that an engineer could actually give credibility", given their position as an academic and "his research, speaking about data,

statistics, I thought that will be more impactful". Yara's reflection on this highlights perceptions of the engineering culture and possible barriers to EDI awareness as a result of engineering-specific values.

RQ3: What factors led to the course being instigated?

The EDI programme's instigation appeared to have initially stemmed from efforts to improve EDI, as part of the requirements for funding from the UK Research Council. According to Damien, "Declan and [other senior staff member] were putting in a proposal for a centre for doctoral training, which is funded by UK Research Councils. And part of the criteria for that is ticking… I shouldn't say ticking, but you've got to include information on equality, diversity and inclusivity". As part of that, Damien explained that CDT were looking at "what positive steps can we take to make things better?". Where "gender's been a big focus over the past" (Damien), Damien explained that efforts "are becoming a bit more focussed on other areas as well", such as "the socioeconomic side of things" and "race".

It appears that it was in this context that Yara initially "challenged" (Yara) Declan in a meeting about improving EDI, where Yara asked if they were "looking to widen the meaning of diversity" to focus more on race (Yara). This initiated a set of meetings in which "[Declan] let me know that there were funds available and they were looking to do stuff" (Yara). Yara had wanted to do something "impactful" to address EDI issues in the past, but had not had the funding to do so, and thus they said they felt "motivated" by the "opportunity to actually change things because there was that financial power behind it". It appeared that the CDT were open to suggestions and enabled Yara to guide the direction of the EDI initiative, informed by Yara's own experiences. Yara explained:

"I went to [them] and really spoke to [them] about my personal experiences. We had an honest conversation about race to start with, where I shared with [them] my experiences and I shared with [them] some of the experiences of the students that I know, and how that trickles into their experience as postgraduate student, how that impact their experiences of PhD, even when they were in organisations. And that openness of the conversation allowed me to decide to get involved" (Yara).

Yara also spoke with Declan about their previous experiences on a leadership programme with Joanne and coaching sessions with Jessica, and the benefits they

had gained from these. Yara felt “it would be great to do a course to bring the two” (Yara) and suggested this idea to Declan. It appeared that these conversations of Yara’s experiences had been a primary motivator for Declan to take action to improve EDI. Declan claimed they were “struck by how much [Joanne’s leadership programme and Jessica’s coaching] seemed to have affected Yara and changed them” and, in response to the EDI barriers for minority ethnic students, Declan said they decided to “see what we could do about it”.

Following Yara’s and Declan’s conversations, Declan approached the steering board with their ideas for a leadership programme for minority ethnic students. After the initial steering meeting, Yara felt there was resistance to the idea and that Declan had become “more careful” (Yara) due to uncertainty as to whether others would think the initiative was fair or not. Yara continued to promote the idea, providing Declan with a document of information about the course and the need for it, to enable Declan to make an “informed decision” (Yara). According to Yara, Declan presented this document at the next steering meeting, after which “the energy had changed” (Yara) and there was “not much in the way of kickback” (Declan). At this point, agreement was made to fund the leadership development course as an EDI programme. There appeared to be a consensus amongst participants that Yara had driven its instigation, with Declan acknowledging that the leadership development programme essentially “came about because Yara had done it” (Declan).

RQ4: What was the aim of the course?

Some aims that Yara hoped would be achieved through the course was highlighted in their advocation of its implementation. One aim in Yara’s perspective appeared to be to provide the participants with validation of their experiences as people of colour. Yara felt that the course would enable participants to realise that “your story is common, you’re not dreaming, these things are real”, instead of internalising negative experiences as being “just you”. It appears that by doing this, Yara believed that it would remind participants that they “deserve equally the same things as other people” and that they have “opportunities to be part of the change”, suggesting that Yara felt the course would validate the participants’ experiences and empower them to make change for themselves.

Another aim identified by Yara relates to the development of knowledge and understanding for career progression. Yara felt that the course provided participants with skills and knowledge about "how they can further their career" and "understanding the system and how to navigate it", something which was deemed important for participants to be equipped with during the early stages of their career, instead of waiting until when people have been "beaten down" (Yara).

Another key aim of the course depicted by Yara was to engage people with power in discussions about race, through sponsorship. Through doing so, it could be seen that power imbalances between participants and sponsors are reduced, as Yara asserted that such discussions meant that "it's not just students or the minority who are emotionally vulnerable and out of their comfort zone, because speaking about race is uncomfortable". Yara explained the aim of sponsorship for sponsors in the following excerpt:

"When you also bring the majority of having to actually have this conversation about race, it gives them the opportunity to start reflecting about things that they never see and hearing people's experiences. And actually, themselves reflect and see what we could change, especially when they are people who are in a position of power" (Yara)

It appears that Yara felt that long-term change could occur through the programme's impact on sponsors and that change should not just be expected of the participants. This is exemplified through Yara's argument that "we need to walk away from the deficiency mindset thinking that the minority is the issue". Whilst Yara felt that "we need to give them more training" and "support", Yara argued that people in power "on the other side" who are either "creating" or "perpetuating" the unequal spaces need addressing, something which this course aimed to do.

RQ5: What were the decision-making processes that took place regarding running the course?

As Yara had attended courses with Joanne and Jessica and had advocated to bring their separate courses together to form the combined leadership programme at the Institution, it appears that Joanne and Jessica were the suppliers in mind for the delivery of the course. According to Damien, Joanne and Jessica were involved at the "moulding stage" of the process and had helped to develop the ideas for the tender documents. However, due to the stipulations of tender processes, the opportunity to

apply had to be made available to other suppliers, as Declan explained that providers could not be appointed “because we know them or because we’ve worked with them before”. The CDT therefore received proposals from Jessica and Joanne, alongside other providers. Ultimately, Declan claimed that Joanne and Jessica “came out top for quality” and thus both won the bids separately. Given that Jessica and Joanne informed the content of the tender documents, it is perhaps unsurprising that they proposals aligned best with the tender documents and it thus appears as though decisions regarding the content of the leadership and coaching aspects were mainly decided by the providers, as opposed to the CDT. With both providers, Declan claimed that they did not influence the content of the course as they “trusted the course providers to know what to cover”.

There were some minor discrepancies in the participants’ accounts of the extent to which the courses provided were tailored to these students. Declan described Joanne’s course as being “fairly set” and claimed that they did not discuss the syllabus or whether to add different elements, but instead went “with the off the shelf stuff that Joanne teaches”. Damien, however, said there had been discussions of how the course could be “moulded to suit our students” and that there were attempts to “convert what would normally be done for people in employment versus how that could be represented a bit better for people doing their doctorates”. However, Damien noted that they were not involved in this aspect of the course, suggesting that they could be mistaken.

In the participant recruitment stage of the process, the advertisement for the course was sent to all EngD students in the cohort, as an opportunity for those who “identify as BAME” (Damien). Damien claimed that this decision was made to not “cherry-pick people” and enable those who “identify as BAME” (Damien) to apply. According to Damien, students were asked to apply through an application process to describe why they “wanted to be part of this opportunity”, given that the “budget” meant that there was a “capacity of ten” spaces on the course. Declan wanted the spaces to be filled so that it would be “value for money”, given the costs of funding the course and Damien claimed “we were trying to fill off the back of that”.

However, given the initial “limited uptake” (Damien) of the course, Damien decided to reach out to some students and ask if there were “any reasons why you felt like you

didn't want to apply for it" (Damien). The reasonings provided pertain to the subsequent research questions and will therefore be detailed there, but these conversations resulted in an increased uptake by students. Despite this, not all spaces on the course had been filled, and it was therefore decided that the remaining places on the course would be offered to others. According to Damien and Declan, Wren "came forward" and asked for one of the remaining places that were unable to be filled. Damien claimed that "we spoke to Joanne and Jessica about it", after which Wren was accepted onto the course.

For the sponsor selection, Damien claimed responsibility, stating that they had tried to match participants with a sponsor "in a similar area to what their research or aspirations were going" (Damien). According to Damien, they had initially contacted the course participants by email and asked if "they had someone in mind" for a sponsor and attempted to match or find sponsors for the participants accordingly. To do so, Damien "started chipping away at senior managers" (Damien) and "harassed a load of people on LinkedIn" (Damien), which resulted in successful sponsor partnerships in some cases, but not all. It seems that this meant that some participants were better matched with their sponsors than others, who had not been able to gain their desired sponsor partnerships.

As the person responsible for the sponsor alignment, Damien had been concerned about the lack of diversity of the sponsors involved, explaining that "we didn't have anybody really representing any other ethnicity than White, and most of them were male as well", which Damien felt was "painting a bad picture". Damien claimed that Joanne responded to this concern by pointing out that "that's the reality of senior management at the moment" (DW) and that "you can't magic people up into these positions" (Damien). Accepting this, Damien finalised the alignment of these sponsors with their protégé, after which Damien had little involvement in the running of the course. After the sponsors and their protégé had met, it was their responsibility to set up their meetings from then onwards and Declan noted that "there was no midterm review of what was going on".

RQ6: What were the perceived benefits and limitations of the course?

<u>Before the course</u>

Within the university, there appeared to be mixed attitudes towards the course. As previously mentioned, Declan recalled there being little “kick-back” in the steering meetings during the tender process. However, the limited uptake during the participant recruitment stage of the course may be indicative of scepticism towards the course. Eligible participants were contacted by Damien to find out why they had not applied, and their responses suggest that some students did not want what the course offered or identify themselves to need it. Damien claimed that some “were maybe offput that [the programme] wasn’t available to all” and “didn’t feel as if they needed the leg up”, suggesting these students did not feel they experienced barriers due to race, nor wanted to receive additional support as a result of it. Damien’s recollection of the perception of one student is exemplified in the following quote:

“[They] basically didn't identify with being disadvantaged, they didn’t like the link between the skin colour and being disadvantaged and so they said, ‘okay yes I’ve got hurdles in life to overcome but that's on me’” (Damien).

This notion of holding personal responsibility for your successes appeared to be shared by some university staff members, too, as Damien recalled a colleague stating that they “don’t agree with the principle of sponsorship and things like that”, as they thought that “you’re in control of your own destiny”. It could be interpreted that this colleague in question disagreed with sponsorship schemes due the additional help and support it provides people in their career progression, suggesting that they believe that the onus is on the individual to make their own successes independently, highlighting a lack of awareness of the inequitable opportunities facing different people. Similarly, Damien explained how their offer to extend the opportunity of the EDI programme to another CDT had been declined as the other CDT were concerned that they would be “treating preferentially one group over another”. This also highlights the notion shared by some within the institution that students should have equal opportunities, rather than equitable ones, despite some groups experiencing more barriers to EDI than others. However, when asked about their awareness of the EDI programme and reasons for allegedly turning the opportunity down, Michael claimed that they “can’t remember it coming to the management committee” although admitted that “it doesn’t mean it didn’t”. From Michael’s recollection, it seemed they did not remember receiving it or turning the opportunity down. Michael claimed that they would “absolutely” have considered anything that “enriches the training and gives a different perspective on it”

but was mindful of how their cohort have a “fairly intensely packed programme” and therefore felt “it would be a question of where it would fit within the programme” and “how much time it took up”. It therefore appears from Michael’s representation that the EDI programme was not an opportunity that they outright disagreed with or would have blankly denied students in their CDT, but that they would have considered the course against other factors, such as busy scheduling.

After the course

Overall, Damien Declan and Yara perceived there to be many positives from the course. Declan thought that the participants “seemed to enjoy” the course and likewise, Damien said that “a lot of the students spoke really fondly, particularly of the coaching”. Damien felt they had seen “the difference that it’s made” for some participants and that they had seen participants “step up and their enthusiasm change”, claiming that one student who had initially been reluctant to take part in the course, was apparently “beaming by the end of it” (Damien). Declan also felt that they had seen positive benefits from the course, such as how one sponsor “had already set things up and opened things up” for their protégé, which made Declan feel that it “seemed like it worked”. Furthermore, Damien had been approached by students that had not participated in the course who had heard “really good stuff” about the coaching and wanted to see if it could be set up for other people, indicating perceived benefits to the course for wider students.

Most perceived limitations that emerged from reflections on the course appeared to be centred around its organisation. Having had little knowledge of the EDI issues impacting minority ethnic students prior to the instigation of the course, Damien felt that CDT had gone into “a bit of an unknown” (Damien) in running as a pilot course. Reflecting upon how the implementation of the course was largely based on the experience of Yara, “in terms of being motivated by the change we saw in them” (Damien), Damien acknowledged that, “obviously, that’s just one person” and that experiences on the course could vary for different people. It appears that Damien could be acknowledging that their limited awareness of EDI issues and initiatives in this area could have been a risk to the success of the course.

Furthermore, there appeared to be a perception that changes to sponsorship could increase the benefits it provides. Yara felt that the course could “go even further” by

inviting sponsors to have “longer meetings and longer reflection time” to get them to “really think about equality and diversity”. To expand, Yara felt that for issues so “complicated”, “challenging” and “important”, sponsors should have a long time to reflect, as often “realisation comes after” deep conversations. By doing so, Yara felt that “their approach will be different”.

Damien appeared to feel that there were limitations to the course due to the sponsor assignment, reflecting that “in hindsight we could’ve done a bit of rejigging with the sponsors”. Damien explained that they had been “caught on the admin side of things” due to the pressure of organising the course, acknowledging that “you’ve got to put in what you get out”. Damien’s difficulties with the organisation of the course as a pilot also appeared to impact the course’s reach. Damien appeared to feel that the EDI programme could have been more beneficial if it had reached more people and that the CDT could have publicised the course wider than they had, something which Damien took blame for due to having tried to “juggle” the organisation of multiple parts of the course. Damien also reflected that they should have been better at planning the course with the Centre of Engineering, in order to “open up those opportunities” to more people, something they also took responsibility for. It appears that the staff encountered difficulties in the organisation of the course due to it being the pilot run and that these may have limited the impact of the course, but the staff were conscious of these issues and expressed willingness to make changes for any future delivery of the course.

Declan and Damien seemed to have perceived sufficient benefits from the course to run it again, yet both also felt that an impact evaluation was required to establish the extent of the impact. Despite feeling that the “immediate impact” of the course was positive, Damien felt that “it’s worth re-evaluating” the “value” of the course and whether the participants still have “that post-course enthusiasm” long-term. Concurring with this, Declan felt the course “seemed worthwhile” but that whether to run it again would be somewhat dependant on the impact found in this evaluation. Re-running the course also appeared to be dependent on funding, irrespective of impact. Declan explained that the CDT were “running out of money” to fund it themselves, but that the university could choose to provide funds for it and they therefore wanted to “try and get the university to look at this” (Declan).

5.3 SPONSORS

Analysis of the sponsor interviews provides insights related to the following research questions: RQ1: “what is the institutional culture at the university?”, RQ3: “what factors led to the course being instigated?”, RQ4: “what was the aim of the course?”, RQ5: “what were the decision-making processes that took place regarding running the course?” and RQ6: “what were the perceived benefits and limitations of the course?”.

RQ1: What is the institutional culture at the university?

Martin described themself to have known “not a thing” about the issues facing minority ethnic students in HE prior to being a sponsor, which they acknowledged was “down to my ignorance”. According to Martin, conversations about race and the experience of minority ethnic individuals “never came into my workspace”. Expressing surprise that it had been within engineering that the programme had been implemented in the first place, Martin stated, “I like the fact that it’s engineering that came up with this, because they would normally be the last people on the earth that would start to come up with it. So that intrigued me. Because that probably made even more difficult conversations because engineers don't speak anyway. I have been one. They're fairly… not people to open up”.

For Aran, engagement with EDI issues and initiatives had been somewhat “recent”. They described themself as a “typical academic” and how they had been “doing what I like, until I started taking leadership positions, since 2013”, at which point things “slightly changed”. Aran felt that prior to the course, they had some understanding of the issues facing BAME students “at several levels, here and there”. They claimed to know “a little bit of statistics” about how different communities “fare in research” within academia. Recounting their understanding of the statistics, they stated that “the Black communities are probably the worst sort of performing in terms of success, both at getting studentships, getting grants, etcetera, they are the worst. And then comes the, I think, Bangladeshi, Pakistanis, Indians, and in research the one community that is doing well is the Chinese”. However, they stated that “I don’t really take these sorts of statistics at face value”. Rather, they claimed to find it difficult to know whether something was “truly discrimination” or “your perception”. For example, relating back to when they started teaching, they described how they had heard from their students from Malaysia and Hong Kong that it was hard to get a job despite their degree

classification being higher than other students. They appeared unsure as to whether these students were struggling to get a job because of discrimination, or because of an unrelated factor that meant that they were not as suitable for the job despite their high grades. They claimed, “it's very difficult to know whether these things are true or not”, as they felt that sometimes, “getting marks is not a reflection of what the employer may be looking for”.

Expanding their argument to their fellow academics, they felt that “lots of academics now complain about their teaching/student feedback scores being low because of their ethnicity”. However, they described themself to have “never had problems”, or in times that they did, they felt it was “not necessarily because of discrimination”. For this reason, they felt that “it's very difficult to know whether they are doing poor teaching or if it’s a genuine bias in the system”.

Furthermore, Aran appeared to have the view that EDI issues were limited amongst their cohort of research students, stating that they had “never had lots of complaints from my women postgraduate students” about “any sort of discriminatory treatment”. However, they considered how this could be due to how “they are really, really very confined to what really they want to do, rather than going out and experiencing the community”, which appears to suggest at least an acknowledgement of the existence of discriminatory treatment.

However, Aran repeatedly made clear that they felt that EDI issues were limited at the university. They reflected upon a time that they had felt “puzzled”, when the thirty students in their workshop, “more or less unanimously said there is a bias within the community”. Aran described how they weren’t “convinced it is true” and stated that “if HR comes up with strong data, then I will believe that there is some evidence of bias within the community”, suggesting a preference for quantitative over experimental, qualitative evidence.

RQ4: What was the aim of the course?

Through their preparation to become a sponsor, Martin developed an understanding of the course, which they described as a means to address “inequalities that the BAME community had come across, had felt they’d come across. Looking to the future, what they might come across that prevents them, and this is from my perspective, from moving through the organisation or moving through other organisations.” Furthermore,

they developed an understanding of their role as a sponsor, which aligned more with the guidance that had been provided to the sponsors than Aran's understanding did. Describing sponsoring as being "what can the sponsor do practically to help the sponsoree", Martin also acknowledged that sponsoring was "different to mentoring", a distinction which had been made clear to the sponsors by the organisers. In contrast to mentoring, Martin explained that sponsorship "is proactive, you're championing" and that their role as sponsors involved "really getting exposed, getting them out of their comfort zones as well but give them those opportunities".

RQ5: What were the decision-making processes that took place regarding running the course?

Decision to become sponsors

According to Martin, they had first been approached to become a sponsor by Declan and Damien, "towards the latter end" of the course. As a senior member of staff at the university, they believed they had been asked to take part as "they knew me, for a start, and I was ex-engineering, and I had loads of contacts". They therefore felt that "part of what I could bring to the process of sponsorship was I knew lots of people" and they could "open doors". Martin's decision to be a sponsor appeared to derive from multiple motivations; for one, they felt that the role "resonated" with their "personal mindset", in that they claimed, "I like being uncomfortable", and, due to their "ignorance" on the issue thus far, this was "something that's scary and a new place to go". Secondly, they claimed, "I like helping people", and "I don't like injustice", which motivated him to take part in order to "see what we can do to make a little bit of help in some way".

Aran recalled being asked to become a sponsor in an email from Damien. Aran's decision to become a sponsor appeared to be entwined in a mix of differing beliefs about EDI initiatives stemming from their personal opinions and experiences. They described making careful decisions about what initiatives to get involved in at the university in the past, which had caused him to decline opportunities previously. For example, they explained how they declined an invitation from the vice-chancellor to participate in a showcase of BAME research achievements, as they claimed that "there is a feeling that I don't want to be patronised because of my background" (Aran). For Aran, they was not "keen" on "showcasing" like that of the opportunity they had

declined, as they felt “that sounded like somehow you are different”. However, they appeared to view the sponsorship aspect of programme in a positive light, as they described it as a “real issue” that they were happy to get involved in, suggesting they felt that sponsorship was good irrespective of the issues it was being used to address. They explained, however, that they weren’t drawn to the EDI programme itself, but rather to the sponsorship aspect. Aran explained that “somebody wanted a little bit of mentoring and that’s my attraction”. Aran also described how another “reason for me to get involved” (Aran) was due to their interest in discovering what their protégé “was facing and kind of advising [them]about [their]next move”.

Decisions regarding preparation for the role of a sponsor

The decisions taken by sponsors in preparation for their role varied. Martin actively prepared for their role by engaging with the guidance provided by the facilitators and developing an understanding of the course and the associated sponsorship scheme, why it was being instigated and what it aimed to achieve. Martin described receiving guidance that was like a “prescription” where they were advised to “meet up sooner than later” and “get to know each other” and were told “you're going to have some uncomfortable conversations”. They also recalled the sponsors being provided with “some background information, some books, some references, some literature, some websites” to prepare them for these conversations about race. These resources Martin claimed to “get into on the weekend, or just sit down and read it for an hour and drop into it somewhere else”, but they felt they did not have much time to do so, as their awareness of the programme came only the week before they first met their protégé. They also recalled feeling unprepared for the role due to their limited prior knowledge and engagement with EDI issues, questioning “how can you be prepared for that?”. To Martin, this made the information provided feel like only “a light touch foundation of getting heads around it”. However, they still felt that they “needed that bit of background to help me as an old White guy”.

On the other hand, Aran did not actively prepare for their role. The sponsor launch held to make the sponsors aware of the requirements of their role and the need for sponsorship, as well as to introduce them to their protégé did not appear to have appealed to Aran, nor did the guidance materials provided. Aran failed to recall details of what was discussed in the sponsor launch, instead saying that “there was some

lectures" but claimed that meeting their protégé and getting to know them and their interests was "all I remember from that meeting". Aran also highlighted how they had not engaged much with the guidance materials provided, saying, "they probably sent me the PowerPoint slides, which I probably, quietly ignored". Despite this, Aran felt sufficiently prepared for their role as a sponsor, as they believed it simply required "common sense", and, as an academic with experience of other organisations, they felt "fairly confident" to take on the role.

Decisions surrounding the matching process of sponsors and proteges

Regarding the matching process of sponsors and proteges, Martin was unaware of why they had been matched with their protégé or "who had done the matchmaking". They considered that it was possible that they had been matched based on how the aspirations of their protégé required an "introduction to quite senior level in the university", which Martin described as the "world I inhabit". Similarly, Aran did not appear to be aware of the way the course and sponsorship had been organised, or why they had been paired with their particular protégé. They claimed that they had "never thought about it" and reflected upon how they were "from a completely different (research) area" to their protégé, but they assumed that "somebody would've probably thought that they would benefit".

Decisions regarding the approach taken as sponsors

Aran described themself to have had "a couple of meetings, but not a lot" with their protégé. Martin, on the other hand, had become a sponsor near to the end of the programme but held the view that "as far as my involvement, this is the start". Following the course closing ceremony, Martin said that they and their protégé "started putting in some regular meetings", where they would meet "every week or every two weeks" for "an hour chatting".

Aran appeared to feel negatively towards the formal guidelines, saying that it "puts more pressure on you to follow certain systematic ways of approaching something which may be very, very, simple to tackle". Whilst Aran was keen to provide advice to those who needed it, they claimed that doing so "should not be a burden" and that "it should not be so formal" where "people are forced to do it", as they felt that "then it is not going to work". Aran therefore resisted against following the guidance for sponsorship provided by Jessica, claiming that they had "decided that that's not the

best way to do it". Appearing to lack awareness or acceptance of Jessica and Joanne's knowledge and practical experience as consultants in their field, Aran discussed how courses are often formed based on research findings, but that there was a "disconnect" between the "theoretical" ideas behind many courses and their "practical implementation". For Aran, belief that courses were often built from research findings and theories appeared to justify not following the guidance provided by Joanne, as they claimed that in reality, they felt that "some of the theories kind of go out of the window". Furthermore, despite the facilitators having practical experience in universities, Aran seemed to feel that as an academic, they had a better understanding of the functioning of the institutional context, stating, "I'm an academic, I know precisely how academia works and how academics work". In contrast, they felt that "somebody from a consulting company trying to advise academics without having any knowledge of academia is always counter-productive".

Therefore, instead of following the course guidance, they approached sponsorship in the way they felt was "more productive", "very simple", and "much more common sense", whereby they would ask "what do you need? What are you looking for? Tell me, so if I can help you, I will. If I cannot, I will tell you where to get help". For this Aran and their protégé, this did not include discussions about race, despite what had been encouraged in the sponsor briefing. Referring to their protégé, they claimed that they "did check with [them]what [their] background is" but that, "in terms of BAME issues, very rarely we discussed anything".

Martin, on the other hand, largely followed the guidance in their enactment of sponsorship. Martin described their first encounters with their protégé to be "just chatty conversations" where they "were in that phase of getting to know each other, building up the rapport". According to Martin, they were in "listening mode" initially, and once they had built "rapport" and "trust", Martin and their protégé had what they described as "an intense batch of conversations" about race, some of which they described as "uncomfortable". This included conversations about the protégés "experiences [of] being mixed-race", which appeared to be particularly eye-opening to Martin in understanding some of the realities that their protégé had had to face due to their racial identity, as they claimed, "I didn't even figure that out".

After their initial conversations, Martin said that they “then got to the point of let’s have some practical help now”, where they asked “let's see what you want to do. Where you want to go in the organisation? What can I do to help you?”. According to Martin, their protégé aspired to work within EDI at the university, and so they “started to knock on doors” and approached the Pro Vice Chancellor, asking for their protégé to be put on the EDI Strategy Group, which they then invited them to, “as simple as that”. However, they acknowledged the imbalance of power between themself and their protégé in this situation, that had enabled him to open a door that they may not have been able to open as easily themself. They felt that, “it’s [protégé] that’s done this”, and that “all I've done is just knock on a door and push her in”, but that the “frustration” was that often, “they can knock on it, but they can’t open it”.

Furthermore, Martin appeared to be committed to their role as a sponsor and keen to continue their sponsor-protégé relationship beyond the course and into the future, claiming, “we’re still talking. Because our outcome isn’t achieved yet. I’m saying our outcome because it is our outcome. Because we’re together in this”.

RQ 6: What were the perceived benefits and limitations of the course?

Both Aran and Martin appeared to feel positively about the overall experience of sponsorship. Martin spoke highly of the programme and felt that “it needs to happen everywhere”, as they had “seen what the sponsorees got out of it”, such as how their protégé had pursued their aspiration of working within EDI, which they attributed to “the confidence that the course gives them”. Martin felt strongly that it should be funded to run again at the university, asserting that “we need to wake somebody up in the university to say, this was a fantastic programme. Pretty cheap to run in the whole scheme of things. Roll it out, for crying out loud, roll it out”. Aran, too, reflected positively on the course. Aran described there being a “satisfaction you derive out of advising somebody” and “passing on something I experienced, how I progressed my career along the research route”, in order to provide someone with an awareness of the academic challenges that they might face in academia and “give them enough of an idea to select the direction they want to go”, but seemingly not related to race.

However, the impact of the course on the sponsors themselves appeared to vary. For Aran, the experience of being a sponsor did not impact them in a way that caused them to think or do anything differently after taking part. In fact, they did not feel that their

role as a sponsor was distinct from other roles they had undertaken in the past. They claimed, “I've mentored a lot of people in my life. This was not very different from any other career advice” and that “none of the things we discussed were a surprise to me. If it was something new, I never expected, then I would kind of rethink a way to approach these things”. Martin, on the other hand, appeared to have perceived themselves to have been hugely impacted by the experience. Martin viewed the programme as “a shared journey” that had been “rewarding for both sponsor and sponsoree”. For Martin personally, having been able to “share experiences with somebody new” and have “time to reflect”, caused changes to their “mindset” and “perspectives”, as they felt that “tackling uncomfortable subjects” in the way that they had done “alters that perception and the way that you view things”. Since becoming a sponsor, therefore, they felt that their “eyes are a bit more open to injustices” as before, “I just wasn't aware, I didn't know, I didn't relate”.

It could be argued that the experience of sponsorship may have impacted Aran differently had they had conversations about race in the way that Martin did. Aran did reflect upon their decision not to discuss race-related issues with their protégé, where they pondered “maybe I should really highlight this sort of factual information to these communities to make them aware”, regarding barriers facing people from minority ethnic backgrounds. However, they did not appear to think that these discussions would be particularly useful, reemphasising their stance that “these things are not always necessarily true” and “there's always this tendency to blame everything on your background”.

For Martin, on the other hand, their perception of the course having been highly impactful appears to be a result of these kinds of conversations they had with their protégé, in which they made efforts to “understand each other”, the importance of which they claimed, “came across quite strongly from the sponsor organisers”. Martin praised the leadership and guidance from the facilitators, and, in contrast to Aran’s critical view on resourcing external consultants to lead the sponsors, felt that the programme “would lack the impact” without such “strong leadership” from them. Martin argued that the course “needs resourcing properly and it needs leading properly” in the way that had been done by the facilitators, because they felt that attempts at enacting sponsorship outside of a formalised programme such as this would likely be unsuccessful as “day jobs take over and it fizzles out”. They appeared to suggest that

work commitments took priority over EDI efforts, which was further emphasised when Martin related to the programme as an opportunity to “jump out of a crazy day job and be humanistic again”, suggesting that there was little opportunity to “be humanistic” in their job.

Whilst Martin spoke extremely highly of the course, the main issue for Martin was how they felt that the process had been “rushed” and that they felt they could have been sponsoring “throughout the training, not at the end”. They therefore felt that it needed to be a “longer process” where “we've done that work as we go through”.

Martin’s other issue related to the funding and resourcing for EDI. Martin explained that their protégé “wanted to go into equality, diversity, EDI space somewhere in the university” as they “wasn't happy with racial integration across the university and wanted to change it”. Whilst they felt there had been an openness from the university to welcome their protégé into spaces where they could be part of improving EDI, they expressed “frustration” that the university “were not resourcing it properly”. They explained how they had been told that “there’s no money at the minute” for a paid job for their protégé in EDI, and they had therefore just been trying to get their protégé involved in that area “on a practical basis”, to “start to build that relationship and start to demonstrate actually, they need to resource this properly”. However, Martin argued that “you need paid positions for this to do it properly. You can't just have people turning up with their lunch hours giving up free time” and felt that there needed to be a “mission” to “get the university to understand actually this needs resourcing properly”.

5.4 EDI PROGRAMME PROVIDERS

Analysis of the EDI programme providers provides insights related to the following research questions: RQ 3: “what factors led to the course being instigated?”, RQ 4: “what was the aim of the course?”, RQ5: “what were the decision-making processes that took place regarding running the course?”, RQ 6: “what were the perceived benefits and limitations of the course?”.

RQ 3: What factors led to the course being instigated?

According to Joanne, Yara was the “driving force” behind the idea of bringing together “the leadership programme, the coaching and the individual student within an institution”, which they viewed to be “the perfect trilogy”. Joanne claimed that Yara

suggested the idea of bringing these together for the CDT's EngD students to Declan. Joanne recalled how the CDT were "positive from the start but also claimed that Yara was "hard to say no to" and that "if [they say] it's going to happen, it's going to happen".

Joanne and Jessica explained how their first connection with the CDT was through Yara and after being introduced, Joanne said they had had "ongoing conversations where we'd had meetings about my work, we'd had meetings with Jessica about potentially what we could do". Jessica recounted how they had "wanted to listen to what it is that they had and how they saw those concerns". Before working with the CDT, Jessica wanted to learn from them in their meetings, "Why now? Why do this? Why is it important?" in order to "understand some of those reasons to enable me to give them the resource that they seek". Recalling how one of the senior leaders claimed "I just want the students to be happy", Jessica said that it "solidified in my heart that I really wanted to help move this forward", as they felt it was both "refreshing" and "so progressive for a senior management staff to feel that about the students". Likewise, Joanne felt that "the intention was there. The commitment was there. The resource was put in place for the programme to happen" and both were keen to be involved in delivering the course.

RQ 4: What was the aim of the course?

From the perspective of one of the course providers, Joanne, the overall course aims were not only to provide "a positive experience" but was also about "thinking about how you can equip postgrad students who will be going out into industry with the strategies to work in industries where there may be some of those systemic issues". they felt that there was sometimes "benign stuff sitting in the background" which this course could address.

According to Jessica, the aim of the coaching was for the participants to understand their "leadership style" and "leadership brand", whilst being very much "about the individual", and identifying their "values", "vision" "purpose", "strengths" and "areas for improvement", in order to create "greater clarity" and a "compelling vision of success". Jessica discussed how "harnessing that can-do attitude" and "building resilience, confidence and self-belief" was also very important. According to Jessica one of the first things they aimed to teach them is how "to harness the right mind-set for success" and how "failure is in the mind". Jessica felt that coaching would enable the participants

to have the right tools to “deal with any challenges, any fears, any limitations with more confidence and more assertiveness”. Through the coaching, they would also able to address “mental health issues” and “wellbeing”, as well as creating a work-life balance and navigating their way through their PhD. In doing so, the participants would “unleash their potential”.

Joanne claimed that their leadership sessions were “not about coming in and fixing people”. Rather, Joanne was “very interested in looking at agency and people being able to recognise what they do in the sphere of leadership, and then being able to navigate what they’re encountering in that space”, Joanne explained that the programme aimed to get participants to look at themselves, their heritage and what they take from their heritage that contributes to their leadership competencies. It aimed to teach the participant about leadership theory, the power of networking, the “labyrinthian experience” that individuals may have to navigate on their leadership journeys and the “twists and turns that people encounter along the way” to achieving their career plans.

Linked to sponsorship, Joanne explained that the leadership sessions were “also thinking about how you can work with your sponsors to get them to help with the advocacy, to give you the opportunity to get on the radar of the right people, to give a steer around funding applications perhaps, to think about public speaking skills, whatever it might be”. Joanne described sponsorship as being “key” as it involves “institutional, organisational commitment to doing the work that they need to do”, and a sponsor should be committed “all the way through the programme and beyond, for “minimally” a year. Without such “work by the institution”, Joanne believed programmes would be “performative”.

By the end of the course, Joanne said participants should be able to celebrate “feeling more empowered, feeling more confident to lead, having a clarity around what leadership means for them and having some stronger networks and stronger strategic networks that the alums could tap into afterwards”.

RQ5: What were the decision-making processes that took place regarding running the course?

Regarding the content of the courses delivered, Joanne’s account stated that their course content had been “bespoke”, as they had never previously delivered a

programme where there had been both a leadership and coaching element. However, they had been able to draw upon their previous experiences delivering leadership programmes to guide the content. They felt that the CDT were looking for “guidance” from a consultant “experienced in this field” and claimed that “they trusted me to come up with a design”. The “steer” they provided to the CDT they felt was both “needed” and “appreciated”.

Likewise, Jessica claimed that their coaching sessions “wasn’t something that was off the shelf”, but, rather, “was very much bespoke” and “tailored to the individual”. Whilst the content was “generic” in terms of looking at different types of leadership, understanding their leadership style and identifying how they work with their supervisors, Jessica claimed that they personalised it to the individual “depending on what we were uncovering during the sessions”.

Jessica explained how for them, it had been a “process” in which they learned from the CDT “what the challenges were” and “what it was that they wanted, understood what the vision was, understood what, perhaps, those key aims and objectives were”. Some of the issues that Jessica said the CDT had presented to them, included “really getting the students to connect with themselves, connect with their why, their purpose”, as well as “about them understanding what some of their limitations were”. Jessica also discussed the students “being from BAME backgrounds” and there being related “issues around that core confidence” and “issues around discrimination” that “some of them have faced in different aspects of their lives”.

Upon learning from the CDT about such challenges facing the students and their objectives with the programme, Jessica claimed they then designed the coaching sessions. They noted how their coaching sessions and Joanne’s leadership sessions were “very complementary” as it was designed so that Joanne could “look deeper into what some of those issues are” in group sessions, whilst Jessica “could address those points on an individual basis” in the one-to-one sessions. Jessica’s coaching sessions also intended to complement the sponsorship side of things, by providing the participants with a “vision” and “purpose” in the coaching sessions that would enable them to plan the kind of help and support they desired from their sponsor.

Regarding the EDI programme participant recruitment, Joanne claimed that Wren’s attendance was “unexpected” and that they “didn’t know that Wren was on the

programme". They also did not know "who made the final decision in terms of inviting Wren to be in the programme" and believed Damien must have thought the programme would have been of benefit to Wren. As a result of Wren's participation, Joanne reported that they had decided to make adaptations to the programme to enable Wren to be included, such as a "separate one-to-one session with Wren" which enabled Wren to think about their identity, but also think about "the other side of the coin", including discussions about "White privilege".

Regarding sponsorship, Joanne held the sponsor launch to provide sponsors with information about their role and responsibilities. Joanne claimed that the sponsor briefing was "important" as "it gives them an opportunity to wrap their heads around what sponsorship even means", but also "to talk about it through the lens of race". On the same day, the participant launch was held, and Joanne described them to have "brought everyone together at the end of it". Joanne recalled how one of the recommendations to both the sponsors and the participants was to read "the Sponsor Toolkit", as it was a "five-module toolkit about why sponsorship matters" which contained "lots of tools, strategies and explanations there".

Joanne claimed they "didn't have access to the sponsors outside of that initial event".

RQ 6: What were the perceived benefits and limitations of the course?

Overall, Joanne and Jessica seemed to feel that there had been a positive impact on the participants from the course. Joanne described seeing "the difference from start to finish" for the participants, and whilst they acknowledged that some participants got more out of it than others "as always", they felt there had been "amazing" progress made by certain participants since they attended the course. Jessica, too, felt that their coaching sessions had been a "great success" in which they saw "weekly transformations" in some people. They described seeing the "incredible" difference in people where they had started "thinking differently and doing differently and getting different results" which they attributed to them having "a great willingness.... to take the right action and to implement". They also felt that the coaching, leadership, and sponsorship "came together really nicely".

Regarding sponsorship, Jessica spoke highly of the sponsorship aspect of the course and how it was complemented by their coaching sessions. Referring to the sponsorship, Jessica discussed how the "mentorship side of things" brought in by

Joanne was “key and paramount” as, during the coaching sessions, the students “crystallised” their “vision” and “purpose”, which enabled them to have a plan of “this is what I want you to do with me, this is the kind of help, this is the level of support that I would like” when they approached their sponsors. They also felt that some of the sponsors were “absolutely fantastic” and were able to “fulfil some of the promises” that they had made to the students.

However, there were also some critical reflections. For example, in previous programmes that they had delivered, they had done a beginning, mid-way and end check-in with the sponsors and felt this was valuable. Additionally, in other programmes they delivered, sponsors were required to write a statement discussing their role as sponsors. From the quality of their statement, Joanne said it was clear whether they had read the recommended sponsor toolkit and whether they understood their role. This is something that they also considered regarding sponsorship encompassed within perceptions of limitations regarding the organisation of the course. Joanne claimed they “personally would have liked a bit more time with the sponsors” as they did not have access to them after the initial launch but acknowledged that their “hands were a bit tied because of the pandemic and access to people”. However, they felt there needed to be more work both to “support sponsors coming on board” and to “hold them accountable”. valuable, as it ensured that the sponsors had “really got to grips with understanding what your role is as a sponsor on the programme”. This, however, did not take place on this leadership programme and it is unclear whether it was suggested.

Additional perceived limitations of the organisation of the course related to the coaching sessions. Jessica discussed how they would have liked to have provided the participants with follow-up sessions after the leadership programme had finished, as the programme was “short” at only nine sessions and they felt they were “almost just getting going”. They explained how it can be difficult as a coach to leave somebody when “they’re not right yet” and they were “just getting there”. They claimed that they had put in a proposal with the CDT to have more coaching sessions because they “believed they needed further support in bringing that confidence, that motivation back” as the programme had finished a while ago. As some of them were approaching the point where they were going to be defending their thesis, they felt that more sessions would “better prepare them”, “remind them of their vision” and help them to “deal with

any stress or any anxieties that they may be feeling". However, they claimed that it "wasn't taken up" by the CDT. If the programme were to be delivered again in the future, Jessica felt that the coaching would have a greater effect if the CDT were to build the programme in "such a way that it follows that last year, like a journey", even if it meant that there were sessions once a month, "just to keep the momentum going" and to provide continuous support until the students finish.

Another limitation of the course could be seen to relate to the decision-making processes of participant selection. Relating back to the decision to include Wren as a White student, Joanne made clear that they came up with a solution that "worked really well" and that Wren was "very welcome and made a wonderful contribution to the programme". They also noted that Wren was highly "switched on in terms of race equity". However, Joanne explained that the programme was "not designed for participants who don't identify as Black, Asian or Minority Ethnic". Joanne felt that the course should have only been attended by the students it was intended for, not an "infill" of others to fill the numbers which they felt creates the idea of "box-ticking". Linking back to the point they made previously about people "superimposing interventions around gender onto race", they felt that "decisionmakers who don't think intersectionally think difference is difference" and it results in programmes such as this one being opened up to students it was not designed for. However, Joanne's view on it was that "if you've got two people, run it with two people. If you don't think it's cost-effective, don't run it". This spurred further reflections on the Institution's understanding of EDI issues generally, as they felt it "says something about where [the Institution] is in its understanding of racism, structural racism and race equity". They also said that it is not the first time this has happened, which "tells you something systemically".

Building on the critique of the decision-making processes, Joanne felt that a lot of decisions made were "pragmatic" due to time constraints etc, and that despite the "good intent" of the Institution, "a lot more work would be needed" to run the programme in a way that "really addresses the kind of racial inequities that we are seeing", not just at the Institution, but in engineering generally and the wider sector. They discussed how "[the Institution] is not untypical when it comes to that" and how generally, there are often many "fault lines" and "fissures" in work focusing on race, in which many things would often be left unconsidered, and initiatives would be run on a low budget.

They compared this to the extensive work which exists on gender, which they claimed to be “far more structured. It’s far more systematic. It’s far more resourced. It’s far less haphazard. It’s far less responsive. It’s more considered”. They therefore felt that the Institution would benefit from work on race equity and increased engagement with race, “outside of the BAME Networks and BAME engineering” and that such broader things may better support an intervention such as this programme. Currently, however, they felt that this programme “sticks out a bit like a sore thumb” due to it being a newly implemented programme within the university, which had only recently engaged in conversations about race equity. For this reason, Joanne felt that there was a risk that the decision to implement the programme could appear to be solely because the university had “extra money” to use, and that afterwards “it’s never going to happen again”. In order to avoid appearing like this, they felt it was important that the intervention was supported through broader engagement in race equity by the university.

5.5 STUDENTS WHO PARTICIPATED IN THE EDI PROGRAMME

This section presents the participant findings under the heading of the relevant research question that they respond to. This includes research questions 1, 2, and 6.

RQ 1. What is the institutional culture at the university?

The participants mostly described an overall positive experience within the institution. In which they perceived there to be high cultural awareness and awareness of EDI issues, combined with active efforts to improve EDI, something which seemed to contribute to the participants’ view of the university as a positive and inclusive place. Ayaan, for example, described the university as being “always in the frontline of promoting multicultural environment”, and Rhea praised how their female supervisor had been “actively involved in International Women’s Day”, suggesting that a demonstrated commitment to EDI by the university contributed to their perception of a positive culture.

One participant, Wren, contrasted the majority's views, however, in claiming that the university’s EDI efforts felt “performative”. This view had seemingly been formed from a number of experiences and observations within their EngD. For example, Wren witnessed a staff member in engineering making a sexist joke despite acknowledging

that it was “probably sexist” before saying it, which Wren felt was exemplary of a “yeah sure I shouldn’t do it, but…” culture that they felt was prevalent within engineering. Wren also described feeling that there was an “expectation of conformity” to a “standard white-collar aesthetic” within engineering, where they “stood out”, and sometimes had their differences pointed out if they did not conform, such as when Wren was made to feel uncomfortable for wearing nail polish after it was commented on by a member of staff. Wren’s recollections suggest that the university’s public portrayal of being dedicated to improving inclusivity was not in fact being upheld by staff who formed part of the institutional culture. Claiming that people “don’t quite connect the dots” between comments made, and their connection to EDI issues, Wren’s reflections imply that EDI progression within engineering is limited by such attitudes within the engineering culture.

Furthermore, despite there being “inclusivity in engineering” events to promote EDI, Wren claimed that these events would likely only be attended by people who already cared about such issues and therefore felt that the events held lacked impact, which may have contributed to Wren’s perception of the EDI efforts as performative. What is more, Wren seemed to feel that engineers would lack active engagement with such EDI efforts, despite there likely being “no particular malice” towards it, as “engineering as a whole doesn't tend to acquire the sort of people who will be actively interested in social justice”. Believing that adherence to “the status quo is easier when the system allows it”, Wren felt that opinions may change if people were taught more about social justice. Whilst they did acknowledge that one EngD course focused on “people in Africa” with a “lack of resources” they questioned whether this was simply because of the lecturer’s interests. Generally, however, Wren claimed that social justice issues would not be of “high priority” for engineers, as they typically had “capitalist sentiments” and would focus primarily on technical aspects, such as “making things efficient”, as well as “what can I get out of it, what benefits me?”, even if social justice issues were caused as a bi-product of their engineering work, as it would be seen as “just how business works”.

This perception of engineers, to some extent, seemed to align with how other participants portrayed themselves in interviews, as there appeared to be a large focus amongst the participants on their technical work and a desire for career success. For example, Madeleine described a compulsory ethics module undertaken as part of their

EngD as “waff” that “could have been a one-day thing”, explaining that they are “more of a numbers person” than a “philosophy type” and that “it’s not what interests me”. However, Madeleine claimed to be “tolerant” of the ethics aspect as they understood that they “have to do it” to get their EngD, and because it “does look good on your CV when you go for your chartership”. Madeleine’s reflections seem to exemplify the mindset that Wren described as being prominent within engineering.

Furthermore, both Madeleine and Wren seemed to perceive there to be different “types” of people with interests distinct to their “type”. This appeared to enable Madeleine to distance their self from what they saw as the “philosophy type”, whose interests would involve ethical considerations, as opposed to their self as a “numbers person”. Wren seemed to make the point that they did not fit within the typical characterisation of an engineer, because they cared about philosophy, ethics, and social justice issues and were strongly anti-capitalist, something which they felt “gets people a bit surprised” given the norm for engineers. The contrast of Wren’s interests with those they perceived as being typical of an engineer was something that Wren partly attributed to having friends outside of engineering who studied Humanities, which Wren felt gave them a “different perspective compared to a lot of engineers” who would “probably be hanging out with other engineers or scientist types”. This seems to portray the idea that engineers’ perspectives and interests are reinforced through interactions with other engineers who share similar perspectives and interests, meaning that the culture that forms within engineering would exclude other people’s ways of thinking.

From the reflections of other participants, it does appear that these students’ interactions were predominantly with other engineers within their cohort. However, the participants highly valued being “part of a community” (Madeleine) with those on their cohort, as they viewed it as somewhat of a support network. Madeleine described the culture amongst their cohort as one of respect, where they felt “part of a team” that “do things together” and where “no one’s a gatekeeper” of information. Rhea claimed that their research group “talk to each other a lot”, praised the diversity and cohesion of the cohort, saying that their group consisted of “a balance of different people” who were “tolerable of each other”, which they felt created a “welcoming” environment.

The majority also seemed to feel well-supported in their EngD by their supervisors and the wider CDT team. Ayaan felt that the university was “listening to me” and was “interested in my ideas”, which appeared to make them feel valued and supported. Madeleine described always feeling able to visit the CDT office or send an email if they had a question or needed help, and Rhea reported feeling that their supervisors were “knowledgeable and helpful and that they were being supported with not just academic work, but personal too, like with dealing with the impact of their partner’s PTSD, where their supervisors would check “how I am feeling and how I am coping”.

RQ 2. How do participants feel that their racial identity impacts their professional experiences?

Many participants were born outside of the UK and discussed their racial identity and cultural background in relation to their assimilation to life in the UK. Eric, for example, described being “naturalised to the British”, but felt that they still have “got the African culture way into me”, something they felt they “can’t change now”. For Rhea, being “bi-racial” in the Caribbean was a “standout kind of feature” but they felt they had “always been accepted there”. Coming to the UK, Rhea felt that “people have a lot of interest in who I am”, positive experiences which they felt helped them “shape” their sense of identity and made them feel “proud of the things I’ve done”. Elijah, on the other hand, did not explicitly discuss the impact of their cultural background on their current experiences, but instead focused on how they felt they had assimilated to the “values of the UK” through living there for “half of my life”. Elijah could not, however, identify any specific value that they felt they had “picked up”, simply claiming, “I don’t know what they are, but whatever those shared values are, I share those values”. That Elijah felt they shared “whatever” values, despite not knowing which, could be seen as a desire to demonstrate their sense of belonging. The reflections of Ayaan, too, appeared to relate to belonging. Having been born in Syria and settled into the UK as a refugee, Ayaan described themselves as an “international citizen”, claiming “I don't feel like I belong to one country, I believe I belong to the world”. This outlook appeared to equip Ayaan with the ability to “like wherever I go” and feel a sense of belonging anywhere, “because the world is my home”. This could have contributed to their sense of belonging and positivity towards the Institution.

However, it could also be that Ayaan positioned their experiences as relative to others, that contributed to their positive outlook of their university experience. For example, Ayaan compared their experiences in university to their experiences in industry, where they reflected upon having experienced racism, prior to starting their EngD. Ayaan felt that in industry, there was limited cultural awareness, and this resulted in experiences of discrimination for Ayaan, claiming “they say you are foreigners… so they deal with you as these”. However, in comparison, they possessed a much more highly positive outlook on their experiences at the Institution, where they were made to feel welcome and that they “enrich” the environment, something which was also impacted by their ability to “see lecturers from different backgrounds, and the students as well”. It appears that cultural awareness of an institution played a pivotal role in experiences of inclusion for Ayaan.

However, that Ayaan maintained a positive outlook and did not appear to view any challenges faced at university as real barriers, could also be due to the positioning of their experiences in the UK as relative to other, “huge” difficulties they faced as a refugee that “came from war”. The impact of this was something that they said they continued to face daily, as they "can't go home" and their "family are still at risk". It seemed that other experiences, such as those within university, did not compare to the “many barriers outside of university”, which likely contributed to Ayaan positive outlook on their university experiences.

Unlike Ayaan, some participants did not appear to consider their racial identity to have impacted their experiences throughout their life or within their EngD. Madeleine claimed that “no one’s ever been racially profiling me or anything like that”. However, they found talking about race to be an “uncomfortable” topic, as they “don’t see race” and “don’t see myself as different”, which could suggest a desire for belonging that feels contested by the idea of difference. Elijah also seemed to share the notion that their racial identity had little effect on their life, recounting how they were brought up similarly to their friend, who was told by their family that they were “beautiful” as the reason for why they had noticed White people staring at them. Elijah acknowledged that people had been staring because their family were some of the few people of colour living in a predominantly White neighbourhood, but the approach taken by their family in the face of this experience meant that they “grew up to be confident”. Claiming to have had a similar upbringing, Elijah felt that race and ethnicity “are the things that

people can visualise" but that they "personally don't think about it when I work because of how I was brought up". Whilst Elijah acknowledged that "it doesn't mean it [racism] doesn't exist", for Elijah, how you are impacted by race and racism "depends on your mindset" and as a result, they "tend not to focus on it", or even "realise" if people are being racist.

RQ. 6. What were the perceived benefits and limitations of the course?

Before the course

Perceptions of the EDI programme were not overwhelmingly positive before the course ran, and it did not immediately appeal to all participants, with some admitting that they were initially hesitant about signing up and two explicitly stating that they had not wanted to. A variety of reasons were given for this, with Madeleine saying that they were "a bit reluctant because I'm not about the waff" and Eric saying that they thought the "developing yourself" aspect was "not for me". Eric also claimed that they had attended other leadership courses in the past, and therefore did not feel that they wanted to take the place of another person who had wanted to apply. Similarly, Wren also did not want to "take away any spaces that would be available to any BAME students", after being encouraged by Elijah to take one of the remaining places on the course that had not been filled. However, Wren decided to take part upon being informed that the spaces were not able to be otherwise filled, as they felt that they would "gain from it". Others only appeared to change their mind on the course upon being encouraged to take part by Elijah, who had been involved in the early stages of the course's creation, or by staff members responsible for the EngD scheme, with Madeleine saying, "why not", being reassured by the fact that it was "only for a few weeks". For Rhea it was an introductory session that convinced them to take part, as they claimed it "made me feel positive and that things are possible".

For the most part, those who decided to take part in the Leadership Course seemed driven by the appeal of building upon knowledge and skills. It was considered "another thing to add to the CV" by Madeleine and "a great opportunity to improve my skills" by Ayaan, given that most jobs "asked you about leadership skills". It was also seen as an opportunity to improve networking skills, something that Wren felt was their main priority when starting the programme, as they felt it would help them in their desired future career as a consultant. For others, the idea of sponsorship in the course was

most appealing. One student, Elijah, who had identified an ideal sponsor in their desired area of work, described this aspect of the course as “a perfect opportunity” to connect with them.

Few participants mentioned being motivated to apply due to perceived benefits of the course that were evidently related to them identifying as a minority ethnic student, except for Eric, who stated that they were “expecting some hints and tips on how to navigate barriers”, and Ayaan, who had been drawn to the coaching aspect of the course as an opportunity to “speak to people I trust”. Ayaan explained that they found it difficult to “talk about certain things or express emotions about some barriers” and that they had “very limited” people that they trusted to talk about their barriers with, something they partly attributed to not being “from here originally”. As a result, Ayaan believed that coaching would be an “invaluable opportunity” to allow them to “explore” and “invest” in themselves and “be stronger”, which they felt “would be much better than crying”.

<u>After the course</u>

Safe space. Upon completion of the course, one of the greatest perceived benefits of participation was the safe space formed within the coaching sessions, in which the participants were encouraged to open up and express their emotions freely. Ayaan recalled being “encouraged to share barriers” as well as learning “how to deal with them”, which they found particularly valuable as someone who struggled to express themselves. Madeleine described themselves to have “a lot of shit going on at home” and alluded to finding it difficult to discuss such issues. As a result, they found it “nice to talk to somebody” in the safe environment created in the coaching sessions, where they felt that no one was going to criticise them for talking about their feelings. As well as a space to express emotions, Madeleine described the coaching as “mental guidance”, which they found particularly useful as a student going into their last year of their EngD. Likewise, Wren felt that many of their “personal issues” that they had been “dealing with” in the coaching had been “thoroughly resolved” during the course. Whilst most participants were not initially drawn to the EDI programme for these reasons, for many, this was the aspect in which they had “gained the most” (Wren). Some participants seemed to feel there was a need for such a space for minority ethnic students but also the wider population, as people hold “pain” (Ayaan) that they “work

hard to hide” because “they don't want be seen as weak” (Wren). Whilst participants found the coaching extremely valuable, after the coaching ended, Wren reported that they felt that they had lost track of the “high intensity stuff that I had figured out” in the coaching sessions and felt that it would have been better if the sessions had been more “spaced out” over the course of their EngD, in order for their impact to have been sustained until the end of their studies., Wren therefore felt they wanted to have at least one more session to “reset”, which could suggest that the impact of the coaching on the individuals was relatively short-term.

Addressing self-limiting factors. Other perceived benefits of the leadership programme were reported in relation to aspects of the course which identified and addressed self-limiting factors that could potentially prevent the participants from pursuing their goals or realising their potential. This involved actively confronting the internal beliefs, attitudes, and behaviours that were identified to hinder their personal growth and success. The findings showed that the leadership programme encouraged participants to acknowledge and work through these limitations and to take steps to change their mindset, behaviour, and approach, to enable them to overcome obstacles and reach higher levels of achievement and well-being, described by Ayaan as having been given “the keys to improve ourselves”.

One way in which self-limiting factors were addressed was through encouragement of self-reflection in order to increase career success. Madeleine reported taking away from the course that “a lot of self-reflection is needed if you're going to be a successful leader” in order to “understand how you’re received”. Similarly, Ayaan described learning to question what self-limiting factors they needed to address in order to overcome barriers and be successful:

“It was about, okay, we are aware of your barriers and you need to accept it, and you need to overcome it. And that's what I liked about the course more than the four month training. So, these are your barriers. […] And you need to accept it. And that's important. And then, how to move. That's the last thing, you need to move, not to struggle or get like isolated like okay, I am really sad, I'm struggling, I don't have power - no, you have the power, but if you don't use it, you will, you will struggle all the time or you'll feel sad. So we got some power. And how to improve your personal skills or interpersonal skills like, okay, do I behave right or do I communicate right? Or just look

to blame the other side? So sometimes we need to blame ourselves as well. […] Blame yourself first. See what you do, and improve and see the result".

Embracing identity and strengths. Such findings exemplify ways that the course focused on the need for individuals to take action to change in some way in order to fit in or succeed in a situation. However, other findings show that the course also focused on empowering the participants to be self-aware of and leverage their strengths and assets. Ayaan explained that they were taught that "every group has assets" or "certain things in their culture", such as different "skills", "knowledge" and "experience" that they could leverage as a strength in different situations. In order to identify their own strengths and cultural assets, participants reflected upon their identity, which for some, seemed to contribute to heightened sense of identity and confidence. Rhea, for example, seemed to feel that they gained a stronger sense of identity and cultural pride through the EDI programme, through encouragement "not to shy away from talking about race". Rhea described the coaching as an emotional experience which was "bringing out lots about yourself" and the overall course caused them to reflect upon the cultural differences they observed when they moved to the UK, such as "a massive difference in the respect" for leaders and elders, which made Rhea feel that they should "forgo" their expectations of respect that they had experienced culturally growing up, to assimilate to the norm they observed in the UK. However, Rhea felt the EDI programme encouraged them to be not "afraid" of embracing their cultural differences, which led them to acknowledge that forgoing respect for elders was "not who I am" and that they "would like respect in a certain way". For Rhea, this made them feel not only "true" to their identity, but made them feel that they could "really stand out and move forward and be comfortable with myself as well". Wren also demonstrated an increased sense of identity, explaining how upon starting the course, they had thought themselves to be aware of who they were as a person as they had "done some stuff to figure it out" previously, and they therefore had not intended to use their coaching sessions to focus on their identity. However, Wren reported that the coach had immediately recognised that they needed to focus on making sure they were "in charge of my own being", and therefore helped them to "figure things out for myself".

Furthermore, some alluded to a realisation that it could be advantageous to incorporate their personal identity and culture into their professional identity and leadership style. Rhea felt that they had gained an "awareness of who I am in this field", which meant

they felt more confident “putting myself out there”. Another participant, Eric, claimed that “one of the biggest impacts for me was a surprise element where I thought I knew who I was, but I didn't know how to make who I was as a person, impact my leadership style”. They explained that becoming aware of this was “very significant” for them, as previously, they “kept my personality in the background” and had believed that you should “leave your personal stuff at home”, but through the course realised that their “personality matters” and that they had “a lot of assets as a person” that they felt they could use to be an “effective leader”. Similarly, Ayaan learned they “you need to show your soul”. This focus on identity therefore appeared to heighten not only the participants’ confidence, but also their aspirations.

Understanding structures of power. In addition to the focus on the individual, some of the sessions in the leadership side of the course focused on raising awareness of structural issues and racism. Whilst this aspect was touched on by some participants, it did not appear to be a big takeaway for the participants, in comparison to their reflections on for example, the coaching. The key takeaways reported, however, were “awareness of …structures of power and influence, who has power, who has influence, who can make a decision, who can't. Aware of your own influences” (Elijah). Having this awareness was perceived as important as it enabled the participants to identify “who can make things happen” (Elijah) as a means of driving career progression, a tool which was acknowledged as particularly important for people from minority ethnic backgrounds by Elijah. Whilst Elijah had earlier commented that they did not think about race or racism, they did consider the barriers facing minority ethnic people when describing the ways in which existing structures influenced job and promotion opportunities. Elijah claimed “it doesn't happen naturally to people of colour or BAME people”, attributing this to the fact that “they're not represented in these higher positions, so therefore someone will not look down and say, OK, I can see myself in that person…I think [they'll] be good at this job, I think [they] should go for promotion”. For this reason, sponsorship was deemed important, as it was “trying to make that relationship happen by forcing the sponsors to realise it” (Elijah) and involved sponsors advocating for their protégé, by “putting your name in certain rooms and certain spaces” (Madeleine).

Sponsorship. Despite this depiction of the aims of sponsorship, the participants did not report being actively advocated for by their sponsors. However, most did speak

positively about their experience of sponsorship for varying reasons. Rhea appeared to depict a dynamic two-way relationship with their sponsor, describing their sponsor to have asked them questions such as “what can [they] do better in [their] position?” in order to “break down barriers and biases”, which made Rhea feel that “with my identity, I’m able to help”. Elijah also felt their sponsor was “great”, and appeared to feel genuinely supported by them, as they noted that their sponsor always “gives time” despite their busy schedule, which Elijah felt was “how you know someone really wants to help, but they don't have to”. Furthermore, Ayaan reported that working with their sponsor helped them to “build up some plan for the future”, an experience shared by Rhea who claimed to have received career guidance from their sponsor, such as “advice on what to look for… boxes I need to think about ticking, if I want to go down this field or this field.” Madeleine and Wren appeared to have less contact with their sponsor than others, but attributed this to different reasons such as busyness and the pandemic, with Madeleine feeling that “I think it will progress more when life kind of gets back to normal”. Wren, too, felt that they would engage more with their sponsor once they had completed their thesis. Despite neither Wren or Madeleine engaging much with their sponsor, they both appreciated having the relationship available, with Wren saying “it’s nice to know” that their sponsor “is there if I want to talk something out”.

Whilst some participants felt happy with their sponsors, this experience was not universal, with Eric admitting that their sponsors were not well-matched to their career aspirations and thus non-beneficial to them. Eric seemed to feel that they had been randomly allocated a sponsor, claiming “it's almost like ‘yeah, there's a sponsor for you. I don't know what your career aspirations is, but we know what's best for you’”. The participant therefore felt that a sponsor more closely aligned to their aspirations would have been more impactful and wished they had been given the opportunity to choose their own sponsor, as they claimed that “the sustainability director would have been perfect” and that they were sure “they would have said yes” if contacted by the CDT. The participant described this as a missed opportunity, explaining that “the reason I share it is so that hopefully, somebody else on the next program would benefit from it”. It is clear that this participant believes there is potential in sponsorship, if done effectively.

Confidence and aspirations. Overall, many participants reported changes to their general confidence levels after taking part in the course, through a combination of a sense of empowerment and skills and knowledge development. Elijah described the course as being “all about motivating you, being more confident and not thinking about the negatives”, with Rhea claiming that it was about “building yourself up, saying I have done this, and being proud of what I’ve done and putting it forward”, highlighting a perceived impact on the positivity and aspirations of the participants. This impact on aspirations was particularly significant for Madeleine. Madeleine felt they “really flourished” as when they discussed “what you want” in life in the coaching sessions, as the coach “set out your aspirations” and made them feel achievable. Growing up, Madeleine said they had never really seen “somebody that has high aspirations”, and so these sessions were particularly impactful in inspiring their confidence to raise and achieve their aspirations. Similarly, Rhea too, reported that the course made them feel “able to achieve things I wouldn't really think about possible otherwise”.

6 DISCUSSION

This chapter discusses the key research findings, exploring the extent to which the programme aligned with student needs, the successes and limitations identified by participants, and the broader institutional and cultural contexts influencing engagement with EDI initiatives. Drawing on thematic insights from interviews and programme documentation, this discussion situates the findings within existing literature on engineering culture, meritocratic ideology, and race equity. The chapter also reflects on the implications for the design and implementation of future EDI interventions aimed at generating meaningful change in postgraduate engineering education.

6.1 ALIGNING EDI INITIATIVES WITH STUDENT NEEDS

The implementation of the EDI programme did not seem to respond to the needs or the desires of the students. Some students actively did not want to take part in the programme as they did not feel they were disadvantaged because of race and did not feel they needed the “leg up”, conjuring the idea that the students felt responsible for their own successes and therefore did not want or need targeted support. This notion was emphasised in various excerpts in which students discussed having a positive mindset and how they just “get on” with things, which suggests they place the onus upon themselves to achieve their goals. This relates to the meritocratic ideology (Cech, 2014) that has been seen of engineers.

Furthermore, some students spoke of how they do not see themselves as different, that they don’t like to think about race, and that they tend not to focus on it. With these perspectives, it gives weight to why the students may not have wanted the programme. Having a programme targeted at a specific group of students not only conjures the idea that they need the “leg up”, which, as discussed, is rejected by the students, possibly due to the meritocratic ideology that is prevalent amongst engineers (Cech & Blair-Loy, 2010; Cech, 2014). In addition to this, it singles them out to stand out as “different”, something which students appeared averse to. This aversion to being seen as different arose not just in direct statements, such as those from Madeleine but also implicitly throughout different topics of conversation. For example, Elijah’s claim that they share the values of the UK, “whatever they are”, seemed as though they wanted to emphasise their likeness to their community by claiming to share certain values that they could not pinpoint. It appeared to be a recurring factor that students did not want

to be seen as different and rejected things such as the EDI programme, that risked making them stand out as different. The reasons for this could be many. I must first question the potential influence of my positionality as the researcher on the students' responses. It has been found that individuals from minority ethnic groups may sometimes feel mistrust when interviewed by outsiders (Ellard-Gray et al., 2015). , As a result, my questioning could have raised doubts about my intentions, leading to defensive answers and restricting the chance to discuss their sense of belonging fully. Dasgupta (2011). had argued that the need to belong is particularly strong for minority groups in situations in which their skills and abilities are challenged), which could explain their aversion to being seen as different as a contestation to their sense of belonging. It could also relate to their positions as engineers, given that the engineering culture is argued to encourage conformity and marginalise those who do not fit in (Cech, 2013). Overall, however, these findings suggest that the students' engagement with EDI issues are limited, and their willingness to engage in EDI programmes is also limited, which limits the ability for EDI progression through these means.

Furthermore, one student described initially thinking that the EDI programme was "waff", highlighting that they did not desire a programme such as this. It seems this was because they did not value things of this type. This connected with many other points made by the student, like when they referred to an ethics module as "waff" and claimed that they were "more of a numbers person". It conjures the idea that certain types of knowledge is valued over others, which relates to literature on technical social dualism (Leydens et al., 2022), which suggests engineers value technical issues over social issues. If this is the case for this student, and potentially others who were eligible to apply for the programme, it could be that the EDI programme did not consist of the type of knowledge they value, and could therefore have been deemed not valuable. This presents engineering as an issue to EDI in this way, as it would mean that the socialisation of engineers to not value non-technical knowledge and things with a social justice focus had acted as a preventor to them participating.

Another reason in which the programme did not seem to respond to the needs of the students was that the students did not perceive themselves to experience any EDI challenges within the Institution. The students did not provide much insight into issues of injustice, or systemic barriers that have been reported elsewhere (Wong et al., 2021) something which was surprising given that the EDI programme had been implemented

to address such issues and barriers. Ayaan, however, had discussed their experiences of discrimination within industry, and seemed conscious of how experiences outside of the university setting may be less inclusive. Whilst such issues do not appear to impact students currently, from Ayaan's comments, the EDI programme could be seen to prepare the students for EDI related barriers they may encounter in their career.

Furthermore, some participants attributed the absence of EDI issues in their lives to having a positive mindset and to the way in which they were raised, highlighting the diversity of the students on the programme and how multiple factors are at play in shaping experiences. However, the lack of criticality with regards to EDI stood out amongst the students interviewed. They praised how inclusive the university was but said little specifically about what made it inclusive. One reason given for it being inclusive was that the student's supervisors were "actively involved in International Women's Day", seemingly showing that visible engagement with EDI efforts is valued by students. However, there appeared to be a lack of depth to discussions around inclusivity, and for some it appeared to be enough simply to see that the university were making visible EDI efforts, with little critical discussion about their opinions on existing efforts or what more could be done. This lack of criticality could be what Riley (2008) claims to be a tendency of engineers to not consider the wider context of problems, and how they focus on problem-solving rather than problem-definition. A socialised uncritical acceptance of authority may mean that the students take a neutral stance on issues of social justice (Riley, 2008) which could explain the lack of depth to their discussions about EDI at the university. It could connect to other aspects of literature on the engineering culture such as technical social dualism and depoliticisation (Leydens & Lucena, 2017; Leydens et al., 2022), too, in that these students may not consider issues related to EDI at the university as a concern for them to engage with, if such social considerations are deemed outside of the realm of engineering work and thus, the focus of engineers (Riley, 2008)). Irrespective of the reasons as to why students did not perceive themselves to experience barriers to their progression within the institution, the fact that they did not was likely a contributory factor to the limited initial uptake of the programme and suggests that the implementation of the EDI programme did not respond to a need or desire of the students. However, it seemed that some students took part as they did not want to waste an opportunity for skills development, which from the lens of literature on

engineering, could be seen as reflective of the meritocratic ideology known of engineers, as skill-development would perceivably enhance their ability to succeed in a merit-based society.

Overall, it seems that the EDI programme was not implemented with enough consideration of what the students perceived themselves to need, which raises questions about the decision-making processes behind the implementation of the programme. However, the students' meritocratic mindset, lack of criticality and lack of engagement with EDI considerations could limit their identification or communication of issues of injustice impacting them or others. Of course, students have agency and they are not solely agents of cultural reproduction (Cech, 2014), but it is important to acknowledge the possible influence of the engineering culture on such issues, given the barriers it has been found to present to EDI progression (Cech, 2013). Whilst outlooks and behaviours could potentially be explained by individual differences, such as upbringing, and that the intersectional nature of one's identity means that multiple factors are at play in shaping one's experiences, the frequency of which aversion to difference and wanting to fit in arose amongst different participants in the findings suggests there could be a shared cause or contributor to this commonality, which is why it is important to consider wider literature on race and the engineering culture. Furthermore, that a comment by Aran echoed the students in their rejection of being seen as different due to their racial identity could suggest that this is an issue that persists throughout education into careers. It could be indicative of a problem, in which it seems that individuals from minority ethnic groups are consistently conscious of being seen to fit in, which suggests something is contesting that , something which needs to be addressed.

6.2 Successes and Limitations of the EDI Programme

The EDI programme appeared to meet many of its aims. The students who participated in the EDI programme praised the experience and those involved in its implementation, delivery, and sponsorship also spoke largely positively of it. The students perceived themselves to have benefited in many ways, such as having learned to embrace their personal identity and assets, how to incorporate their cultural identity into their professional identity and leadership style, how to be self-aware and address self-limiting factors, and how to navigate structures of power. In addition, the students felt

they had gained skills and knowledge that would aid their career progression. The students seemed to feel empowered and that they had increased confidence since attending the programme. For some, this positively impacted their career aspirations. Therefore, in many ways, the EDI programme appeared to meet many of its objectives, as depicted in the findings from the programme documentation and within the interviews with university staff members and the programme facilitators. The students highly praised the experience and felt that they had gained a lot from it. Ayaan description of the programme as having given them the “keys to improve ourselves” encapsulates the essence of the students' key takeaway from the programme.

Whilst it is highly positive that the students perceived numerous benefits that increased their confidence and sense of empowerment, students’ key takeaways from the programme appeared to be centred on ways in which they had learned to adapt or change aspects of themselves to enhance their career progression. It appears that these outcomes were intentional, too, given the programme documentation which showed that an aim was to “afford them with the skills” [1], implying a potential perception that these students lack these skills. This appears indicative of a deficit approach, resembling EDI approaches criticised in literature for their focus on the individual rather than the system as the root cause (Riley et al., 2014).(Kane, 1995)

Furthermore, it implies that there are certain skills, knowledge and ways of behaving needed for career progression that the students were encouraged to learn and adapt to. Doing so instead of addressing the system as the root of EDI issues, places the burden of addressing EDI issues on minority ethnic individuals, and reinforces the idea that the existing system and its norms are right, and that the students need to learn to fit in within it (Delgado, 1990; Mejia et al., 2020). A CRT perspective would argue that this encourages minority ethnic students to conform to the majority (White) culture, norms, and expectations for career progression, and thus encourages the reproduction of dominant White norms (Bhopal, 2020). In this way, the EDI programme somewhat demonstrates the interest-convergence tenet of CRT, in that this effort to progress EDI works in the benefit of White people (Rollock & Gillborn, 2011).

However, this programme also aimed to catalyse structural change through the two-way sponsorship relationship, as seen in document [7]. This highlights that the programme did not solely aim to focus on minority ethnic groups; there was the

intention to also impact people in positions of power, which could be seen to reduce the burden on those from minority ethnic backgrounds to address EDI issues. However, it appears that this is one way in which the programme may have struggled to meet its aims. Whilst Martin engaged with sponsorship in the way advised, which meant that the experience significantly impacted their perspective and understanding of racial injustice and EDI issues, Aran did not. Aran's critical attitudes towards EDI efforts seemed to result in their disengagement with the materials and guidance provided. This meant that they did not enact sponsorship in the way required to enable the possibility of people in power being impacted and the catalysation of structural change. Some of the key ways that sponsorship was meant to impact sponsors was through their engagement with materials that would aid their understanding of EDI issues, and through "uncomfortable" discussions about race in which the sponsor and protégé developed a mutual understanding of each other's experiences and perspectives. However, Aran engaged in neither, which meant there was no possibility of Aran being impacted by the experience of sponsorship in the way that was aimed. In fact, Aran consistently referred to sponsorship as "mentoring", a distinction that was made particularly clear from Joanne, which exemplifies the extent of Aran's disengagement with the aims of sponsorship. It is perhaps unsurprising, then, that Aran did not find the experience particularly distinct from previous mentoring roles and did not feel they would change anything going forward.

It is of value to try to understand Aran's attitude towards the EDI programme, in order to pinpoint things that can act as a barrier to effective engagement with the programme. In addition, as senior members of staff at the university, sponsors have the power to influence decisions and strategic directions, and therefore their attitudes and actions are important to examine as they contribute significantly to the institutional culture. Firstly, Aran's critical attitudes towards EDI could be seen as the outcome of experiences related to their own racial identity. It seems that Aran did not feel that they had experienced discrimination on their career journey into their senior role, and as a result, questioned the existence of barriers for others. The focus on their individual success and the idea conjured that others should be able to do it too is reminiscent of the meritocratic ideology prevalent in engineering (Cech, 2013). Furthermore, Aran's assertion that they would believe the existence of EDI issues in engineering "if HR comes up with strong data" highlights their disbelieving attitude towards EDI issues but

also seemingly the prevalence of the technical social dualism ideology (Leydens & Lucena, 2017) in demonstrating the forms of knowledge valued by Aran. Despite having been told first-hand by their students about experiences of bias and discrimination within the university, Aran would not believe it without “strong data” to support it, exemplifying Yara’s belief that a speaker who focused on facts and statistics instead of emotions in their talk about EDI issues was necessary in order to have credibility with the STEM audience. Furthermore, Aran’s point of how they had declined an invitation from the vice-chancellor to participate in a showcase of ‘BAME’ research achievements, as they did not want to be “patronised” and felt that such an opportunity “sounded like somehow you are different” further exemplifies the attitude towards EDI efforts with which they were entering the EDI programme. What’s more, it connects with the earlier discussion of the students’ aversion to being seen as different. As such, the same literature regarding fitting in and belonging could be seen as relevant to Aran (Dasgupta, 2011) Overall, it appears that cumulative factors impacted the way that Aran viewed the EDI programme and ones alike, and how Aran subsequently enacted sponsorship. Aran’s approach limited the ability for the programme to function in the way it intended, and contributing to this appears to be the engineering mindset that Aran seemed to possess, in combination with their perspectives as a result of their racial identity. Despite engaging as a sponsor in an EDI programme for minority ethnic students, it appears that Aran was not in favour of such programmes and would not be someone to promote one or lead by example by participating in one. It is therefore interesting as to why they decided to take part as a sponsor, but perhaps telling as to why they did not enact sponsorship as advised. This is showing that whilst EDI efforts are being promoted, behind the scenes, there is a lack of support for them amongst staff and students, which supports Wren’s sense that there is a performativity to EDI efforts, and also to Joanne’s assertion that the EDI programme could risk being “performative” without institutional commitment demonstrated by sponsors “doing the work”.

Given that the remaining sponsors would not agree to an interview, it is unclear how they enacted sponsorship and whether they were impacted by the programme as intended. It is therefore hopeful that the programme resulted in an impact on more than just Martin, as it would take more than one person to start changing the institutional culture. However, the remaining sponsors’ unresponsiveness to invitations to

participate in this research, despite knowing that such research could improve understandings of the programme to inform and improve future EDI offerings, may say something in itself, and indicate a lack of commitment to "doing the work that they need to do" (Joanne).

Overall, it is clear that the EDI programme met many of its aims related to developing the skills and mindsets of the students. However, questions arise about the messages these aims convey regarding the causes of EDI issues, as they seem to place responsibility on individuals rather than on systemic factors. It is important to recognise that the programme did not intend to focus solely on minority ethnic students but aimed to drive structural change by influencing the mindsets of sponsors. Yet, findings such as those from Aran suggest that the programme's impact on sponsors, and therefore its potential to effect structural change, may have been limited. Nonetheless, I acknowledge that I cannot fully represent the experiences of sponsors who were not interviewed, and I remain hopeful that the programme's goals of influencing those in positions of power were more successfully realised through them.

6.3 Institutional Culture: Progress and Complexities

The implementation of this EDI programme itself, alongside other EDI efforts at the university, suggests progress by the university in working to improve EDI. Despite these efforts and positive perceptions of EDI at the university, the findings suggest a lack of institutional backing.

Firstly, there appears to be a lack of awareness of EDI issues by senior members of staff at the university. For the most part, this lack of awareness is acknowledged by the staff members. For example, Damien, Declan and Martin each noted that they had had limited awareness of the EDI issues impacting minority ethnic groups, prior to the instigation of the EDI programme. As a result, the instigation of the EDI programme was predominantly a result of Yara's advocacy for it based on their own experiences. Yara seized the opportunity to help implement this EDI programme upon being told that there were "funds available and they were looking to do stuff" (Yara), which seemingly highlights the opportunistic nature of decisions surrounding the implementation of such an initiative. The CDT staff were challenged and guided by Yara as the "driving force" (Joanne) behind the course, with little knowledge of their own about the issues it sought to address. It appears, therefore, that the

implementation of EDI programme had been instrumental in their own learning, due to the information provided by Yara and the course facilitators.

However, the CDT's lack of understanding of EDI issues related to race had implications for the EDI programme. A key demonstration of this was the decision to include Wren in the EDI programme as a White person. Whilst Damien claimed that Joanne and Jessica were asked if Wren could participate, Joanne asserted that this was not the case and rejected the idea that a White person should be able to take part to "infill" a remaining space, given that the course was designed for minority ethnic students. Joanne's priority appeared focused on being impactful through the course and addressing its stated aims, yet the CDT's decision to infill with a White student suggests their priority was to ensure cost-effectiveness of the course, irrespective of the aims. This becomes apparent when contrasting a quote by Joanne that "if you've got two people, run it with two people. If you don't think it's cost-effective, don't run it" with a quote by Declan that the spaces on the courses should be filled to ensure "value for money". This demonstrates a lack of institutional support for the course through the CDT's ignorance of its design and parameters. Moreover, it exemplifies how the CDT's lack of understanding of race-related EDI issues itself can be a limitation to EDI progress, as it resulted in the CDT preventing the course from being delivered in the way intended and for the purposes stipulated.

In addition to implications due to a lack of understanding of EDI issues, there also appeared to be implications due to the CDT's lack of preparedness for such a programme. Relating back to the earlier discussion on sponsorship, the limitations to the potential of structural change caused by Aran's way of engaging with sponsorship can draw criticism of the CDT, too. Firstly, in their choice of sponsors. It appears from the findings that there were difficulties in finding people to be sponsors, and as a result, there was not a sufficiently selective process of deciding who would be most suitable as sponsors. Secondly, after the sponsors had been provided with the materials to guide their enactment of sponsorship, there was no monitoring of sponsors' engagement with the materials. As a result, the lack of engagement by sponsors like Aran went unnoticed. Thirdly, there was no monitoring of how sponsors engaged with their protégé, and as such, it also went unnoticed that Aran was not enacting sponsorship in the way intended. If there had been monitoring at any of these stages, potential issues may have been flagged and addressed. As a result, the CDT can hold

partial responsibility for the limitations to sponsorship that occurred. Such shortfalls in the management of the course were acknowledged by Damien and attributed largely to disorganisation and unpreparedness due to it being the pilot version of the course. However, this unpreparedness is just one factor contributing to a lack of institutional support for the effective implementation of such a programme.

Furthermore, within the institution, there appeared to be conflicting opinions about having this EDI programme, which indicates that there was not strong institutional support to its implementation. For example, Yara faced resistance to the idea of implementing a programme specifically for minority ethnic students, due to uncertainty as to whether the initiative was fair or not. Similarly, Damien recollected a conversation with the Head of another CDT who refused the opportunity for minority ethnic students on their cohort to attend the programme due to the idea that it unfairly benefited one group over others. Furthermore, a staff member had told Damien that they disagreed with the idea of sponsorship as they felt that everyone is in charge of "own destiny". These examples not only suggest a lack of consensus over the benefits of this EDI initiative within the institution and therefore a non-unified institutional response to EDI issues, they suggest that senior staff members who made these comments perceive the current HEI landscape to be fair, and that this fairness would be unbalanced by providing this programme for minority ethnic groups, as it would privilege them over others, a notion which disregards the pervasiveness of White privilege in existing social systems (Pawley et al., 2018) and exudes the CRT notion of colour-blindness (Pawley et al., 2018). In addition, the latter point about sponsorship particularly seems related to the meritocratic ideology prevalent in engineering (Cech, 2013), highlighting how the engineering culture may limit understanding of and engagement with EDI issues. These points also, once again, point to the idea of a performativity to EDI efforts within the university, as it shows that behind the scenes of the EDI efforts, senior staff members are critical of such efforts and do not support them. This is relevant when considering Wren's recollection of a staff member making a sexist joke. Despite the university's public portrayal of being dedicated to improving inclusivity, this suggests that it was not, in fact, being upheld by staff who formed part of the institutional culture and thus conjures the sense of performativity.

It is unclear whether this sense of performativity and a lack of understanding of race-related EDI issues is reflective of the university as a whole, or solely within engineering. Declan's reference to the university already doing "race charter stuff" suggests that, despite awareness of race-related issues being new to Declan, Damien and Martin, it was already being acknowledged and addressed in other areas of the university. This therefore raises the question as to why engagement with social justice issues has been slow within engineering and connects to literature that the engineering culture creates barriers to EDI progress (Cech, 2013, 2014; Leydens & Lucena, 2017).

Overall, it seems that whilst the institution have made well-intentioned efforts to improve EDI through the implementation of this EDI programme, there is a lack of strong institutional backing, varying levels of awareness of EDI issues, and challenges in the implementation of the programme which suggest a need for a more informed and cohesive response to EDI.

7 CONCLUSION

This research has examined the implementation of an EDI programme involving coaching, leadership development and sponsorship, for engineering doctorate students from minority ethnic backgrounds. I examined this EDI programme through several research questions which shed light on the institutional culture, students' experiences in relation to their racial identity, the motivations to implement this EDI programme, the decision-making processes it involved, the aims of the programme, and its perceived benefits and limitations. This final chapter reflects on the implications of the key points raised in the Discussion chapter and synthesises the novel contributions of this study to understandings of EDI for minority ethnic groups in engineering.

One of the main messages highlighted in this research is the importance of the alignment of EDI initiatives with the needs of students. Many students were uncertain about participating in the programme due to their belief that they were not disadvantaged by their racial identity and that they did not require targeted support. These beliefs appeared to be rooted in a meritocratic ideology, where students emphasised their individual responsibility for their success. Furthermore, students demonstrated a lack of criticality in discussing EDI issues, which may have been influenced by the prioritisation of technical over social concerns within the engineering culture.

Moreover, students seemed to be deterred from participating in the EDI programme due to an aversion to being seen as different from others. This highlights potential tensions around belonging that could be related to their racial identity, or to socialisation within the engineering culture, or both, exacerbated through programmes that single them out. These findings highlight the importance of understanding the specific issues impacting students, with consideration of how intersecting factors may impact their experiences.

Whilst there were issues regarding the EDI programme's alignment with the students' needs, the programme successfully achieved many of its stated aims and the students praised the many personal and professional benefits they felt they had gained. However, limitations to the programme's aims and approaches were identified through a critical lens, highlighting too much of a focus on addressing individuals' skills and

mindsets, and too little of a focus on addressing problems within the wider system. Sponsor engagement was identified as critical for enabling structural change, but within this EDI programme, challenges in securing sponsor engagement limited the programme's ability to have a wider structural impact. As a result, the programme risked reproducing a deficit model that problematised the minority ethnic students and encouraged their assimilation to White power structures. Without the intended sponsor impact, the programme's focus shifted largely to students learning to adapt to the existing system, with little being done to address problems within the system itself. This highlighted the importance of sponsor commitment and support for such EDI programmes, to enhance the possibility of a more holistic approach to addressing EDI issues.

In addition to commitment from sponsors, commitment from the institution as a whole is imperative for supporting EDI programmes. This research highlight complexities in the EDI efforts of the university. Whilst efforts have been made to progress EDI, they exist in a context that lacks genuine institutional backing, limiting the effectiveness of this EDI programme, and conjuring the idea of performativity in terms of EDI efforts. This raises questions as to the preparedness of the institution for the implementation of such a programme and emphasises the need for an informed and consistent approach to EDI.

7.1 RECOMMENDATIONS AND FUTURE WORK

From these findings, I suggest several recommendations for future work.

1. **Design EDI initiatives with a detailed understanding of the specific needs of the target group, considering intersectional identities.** Consult the target audience on their perceived barriers and needs and centre their voices. This may start to enhance engagement in EDI efforts.
2. **Focus on making structural change.** Whilst EDI programmes focused on individual development may help students navigate existing systems, undertaking this approach alone encourages assimilation to those unequal systems and risks reinforcing them. Sustainable, impactful change will not be made until the structures that produce inequality are deconstructed and transformed.

3. **Address barriers to EDI within the institutional (and engineering) culture.** The impact of EDI programmes will be limited if they operate within a culture that holds conflicting attitudes towards EDI or lacks genuine understanding or commitment. Without directly confronting these cultural barriers, such programmes will likely struggle to deliver meaningful or sustained change.

Overall, this research has highlighted the complexities involved in implementing an EDI initiative for minority ethnic students in engineering. The potential for such EDI programmes to make impactful and long-lasting change relies on a cohesive commitment to EDI within the institution. It is important to examine barriers to EDI within the specific institutional context, and in this case, engineering context. This allows for a fuller understanding of the context-specific factors that may shape or constrain the impact of EDI work. I therefore argue for holistic, context-specific approaches to EDI that focus on structural change, centre the voices of those being targeted by such programmes, and account for the intersectional nature of a person's identity.

APPENDICES

1. Ethical Approval

LEAD APPLICANT NAME: Francesca Bartram
DISCIPLINE/DEPARTMENT: Engineering
PROJECT TITLE: How do the disciplinary practices of Engineering demarcate boundaries of inclusion?
APPLICATION REFFERENCE NUMBER: FB_27-08-21

Swansea University
Prifysgol Abertawe

Date of review board: November
Committee members in attendance: Chairs

Date: Wednesday 17th November

Dear Francesca,

Thank you for your recent ethics application.

This decision letter is to inform you that the ethics application for the above titled project has been reviewed and approved. The ethical approval number for this application FB_27-08-21b approved from 17-11-21– end of approval 30-06-23.

This letter is for Swansea University, College of Engineering Research Ethics and Governance approval only. Local Health and Safety, in addition to appropriate risk assessment guidelines are required separate to this approval, unless otherwise stated herein, and must be adhered to.

Associated researchers must not deviate from the approved protocol or extend beyond the approval end date. Any desired deviations or approval date extensions are subject to the ethical approval amendment process. Upon completion of the approved project researchers responsible for this application must submit a final (short) statement to the ethical committee stating the completion of the project, unless a time extension is being requested through the amendment process.

Any significant un-anticipated adverse effects/events (i.e. not those predicted and stated in section 8 of the ethics application form) must be reported to the Ethics committee upon researcher realisation (email: coe-researchethics@swansea.ac.uk; with the subject title including the study approval number followed by "Adverse Effects/Events").

If you have any further questions relating to your application, please contact: coe-researchethics@swansea.ac.uk.

Please keep note of your approval number for future reference and correspondence relating to this application.

Best of luck with your research.

Warm regards,

Aynsley Fagan

(on behalf of the College of Engineering Research Ethics and Governance Chair)

College of Engineering Ethics and Governance Committee Administrator
College of Engineering | Y Coleg Peirianneg
Swansea University | Prifysgol Abertawe
Fabian Way | Ffordd Fabian Crymlyn Burrows
Swansea | Abertawe
Wales | Cymru
SA1 8EN

Email: coe-researchethics@swansea.ac.uk.

2. Sample Information Sheet

PARTICIPANT INFORMATION SHEET
(Date: 18/08/21)

Project Title:

Diversity and Inclusion Initiatives in Postgraduate Engineering: A UK based case study

Contact Details:

Francesca Bartram
[redacted]

1. Invitation Paragraph

Thank you for agreeing to take part in this study.

You may be aware of the current concern around improving equality, diversity and inclusion (ED&I) within the engineering sector. The underrepresentation of BAME students remains a prominent issue and stark differences are found between ethnic groups in terms of retention, outcomes and progression, suggesting that barriers exist within the discipline. In addition, previous research suggests that the culture of engineering itself may act as a barrier to ED&I, for example, by standards of rigor and the position at which the boundaries of the content of engineering are drawn. In order to make change, it is important to understand these barriers and the wider context in which they exist.

As [redacted] University implemented a Leadership Course for BAME EngD students, this research will attempt to understand the origins of this course and how and why it was set up.

2. What is the purpose of the study?

The purpose of this study is to examine the barriers faced by postgraduate engineering students and the systemic and institutional structures in which they exist. It is hoped that such a study will allow us to make recommendations about making change to improve ED&I in engineering.

3. Why have I been chosen?

You have been chosen because you were involved in the delivery of the Leadership Course. Taking part is voluntary and you have the right to withdraw if you wish, for up to a week after the interview (when data has been transcribed and anonymised).

4. What will happen to me if I take part?

If you take part, we will arrange a 45-60 minute interview at [redacted] University or via

a system of your choosing, such as Zoom, at a time convenient to you. The meeting will be recorded and transcribed.

5. What are the possible disadvantages of taking part?

There are no foreseeable disadvantages of participating in this research.

6. What are the possible benefits of taking part?

In order to make change to improve ED&I in the engineering sector, it is important to understand the wider context in which barriers exist. This study will help to understand the Leadership Course and how and why it was set up, hopefully allowing us to make recommendations about making change to improve ED&I in engineering.

7. Will my taking part in the study be kept confidential?

Data Protection and Confidentiality

Your data will be processed in accordance with the Data Protection Act 2018 and the General Data Protection Regulation 2016 (GDPR). All information collected about you will be kept strictly confidential. Your data will only be viewed by the researcher/research team.

All electronic data will be stored on a password-protected computer file on MS OneDrive. Your consent information will be kept separately from your responses to minimise risk in the event of a data breach.

The lead researcher will take responsibility for data destruction and all collected identifiable data will be destroyed on or before June 2026.

Please note that the data we will collect for our study will be made anonymous. The participant names and institutions will be known only to the project team. Interviewees will be allocated pseudonyms in any published work. Identifying features (e.g. course features that are unique to that institution and could lead to identification) will be removed upon transcription. It will not be possible to identify and remove your data following thematic analysis and coding, should you decide to withdraw from the study. Therefore, if at the end of this research you decide to have your data withdrawn, please let us know before you leave.

Data Protection Privacy Notice

The data controller for this project will be [redacted] University. The University Data Protection Officer provides oversight of university activities involving the processing of personal data, and can be contacted at the Vice Chancellors Office.

Your personal data will be processed for the purposes outlined in this information sheet.
Standard ethical procedures will involve you providing your consent to participate in this study by completing the consent form that has been provided to you.

The legal basis that we will rely on to process your personal data will be processing is necessary for the performance of a task carried out in the public interest. This public interest justification is approved by the College of Engineering Research Ethics Committee, [redacted] University.

The legal basis that we will rely on to process special categories of data will be processing is necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes.

How long will your information be held?
We will hold any personal data and special categories of data for 5 years.

What are your rights?
You have a right to access your personal information, to object to the processing of your personal information, to rectify, to erase, to restrict and to port your personal information. Please visit the University Data Protection webpages for further information in relation to your rights.

Any requests or objections should be made in writing to the University Data Protection Officer:-

University Compliance Officer (FOI/DP)
Vice-Chancellor's Office
[redacted]
Email: dataprotection@[redacted].ac.uk

How to make a complaint
If you are unhappy with the way in which your personal data has been processed you may in the first instance contact the University Data Protection Officer using the contact details above.

If you remain dissatisfied then you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at: -

[redacted]

8. What if I have any questions?
Further information can be obtained from the researcher contact stated above. The project has been approved by the College of Engineering Research Ethics Committee at [redacted] University. If you have any questions regarding this, any complaint, or

The legal basis that we will rely on to process your personal data will be processing is necessary for the performance of a task carried out in the public interest. This public interest justification is approved by the College of Engineering Research Ethics Committee, [redacted] University.

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If you remain dissatisfied then you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at: -

[redacted]

8. **What if I have any questions?**
Further information can be obtained from the researcher contact stated above. The project has been approved by the College of Engineering Research Ethics Committee at [redacted] University. If you have any questions regarding this, any complaint, or

concerns about the ethics and governance of this research please contact the Chair of the College of Engineering Research Ethics Committee, [redacted] The institutional contact for reporting cases of research conduct is Registrar & Chief Operating [redacted] researchmisconduct@swansea.ac.uk Further details are available at the [redacted] webpages for Research Integrity. http://www.swansea.ac.uk/research/researchintegrity/

3. Sample Consent Form

PARTICIPANT CONSENT FORM
Date: 18/08/2021

Project Title:
Diversity and Inclusion Initiatives in Postgraduate Engineering: A UK based case study

Contact Details:
Francesca Bartram
[redacted]

	Please initial box
1. I confirm that I have read and understood the information sheet dated 18/08/21 for the above study and have had the opportunity to ask questions.	☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.	☐
3. I understand that sections of any of data obtained may be looked at by responsible individuals from [redacted] University or from regulatory authorities where it is relevant to my taking part in research. I give permission for these individuals to have access these records.	☐
4. I understand that data I provide may be used in reports and academic publications in anonymous fashion	☐
5. I agree to take part in the above study.	☐

Name of Participant	Date	Signature
Name of Person taking consent	Date	Signature
Researcher	Date	Signature

4. Sample Interview Schedule

8. What is your experience of the culture of engineering at the University?
    - (Definition: Tonso, 2007 defines engineering culture as socialisation into a system of practices, meanings, and beliefs shaping who students become.)
    - What traits do you see in engineers? Do you share these traits?
    - Is there any conflict between your personal traits and those expected in engineering?
    - Are staff approachable? Are peers friendly?
    - Do you feel included and valued?
    - What are the standards of work and academic rigour like?
    - Do you feel supported?
9. How do you think the culture of engineering influences your experience as an EngD student?
    - Expectations, standards of work, boundaries of engineering, what is valued?
    - Can you provide examples?
    - What about leadership modules?
10. How do your personal identity and values align with the culture of engineering?
    - Do you identify as an engineer?
    - Have you experienced any conflicts between your professional and personal identities?
    - Which engineer traits do you see in yourself, and do these conflict with your personal traits?
11. Have you faced any barriers to progression within the course or within engineering as a career?
12. Is there anything else you think is relevant to mention so far?

Questions on the Leadership Course (EDI programme)

13. Why did you sign up for the Leadership Course?
    a. Where did you hear about it?
    b. How do you feel about the course being specifically targeted at minority ethnic students?
    c. How did it feel during the course?
    d. How did you feel about asking to participate?
    e. To what extent was the course tailored to your needs?
    f. What motivated you to attend?
14. Was this decision influenced by anything we have discussed?
15. What were your expectations for the Leadership Course? What were you hoping to gain?
16. What effect do you feel the Leadership Course had on you and on others?
17. Are there any issues you have experienced that the course did not address?
18. Do you have any suggestions for how to address experiences not covered by the Leadership Course?
19. What are your future career ambitions? Have your aspirations changed during your EngD or since the Leadership Course?
20. Is there anything else you would like to add?

Interview Schedule – Student Participants in the EDI Programme

Introduction

This research aims to understand the barriers faced by postgraduate research (PGR) students in the [redacted], while exploring students' perceptions of the culture of engineering and whether its constructed boundaries act as inclusionary or exclusionary practices.

Research Questions

1. What factors do students who participated in the Leadership Course perceive as barriers to their progression?
   a. How has the Leadership Course helped them overcome these barriers?
2. How do students perceive the boundaries of engineering?
   a. How does this perception influence their sense of identity, values, and belonging?

Interview Questions

1. To start, could you tell me a little about yourself and what you study?
2. How would you describe your identity and characteristics? (e.g., gender, age, race, ethnicity)
3. How would you describe your personal values? For example, what is important or a priority in your life?
   a. Do your values connect to why you chose your area of study?
4. Could you describe your route to studying your EngD?
   - When did you start your EngD?
   - What influenced your decision to apply?
   - Did you experience any difficulties along the way?
   - Why did you choose your particular research topic?
   - What were your expectations when starting?
5. How did your first impressions of being an engineering student compare to your expectations?
   - The environment?
   - Inclusion?
   - Standards of work and academic rigour?
   - Course content?
   - Support from staff?
6. Have your impressions or perceptions changed since that initial period?
   - How did you settle in or adapt?
   - What about workload?
   - How do you view engineering work now?
7. How do you feel your personal identity or characteristics have influenced your experience during your EngD?
   - Experiences of inclusion or exclusion?
   - Sense of belonging?
   - Do you identify as an engineer?

GLOSSARY

BAME: Acronym for Black, Asian, and Minority Ethnic; used in some UK contexts but avoided here due to aggregation concerns.

CDT: Centre for Doctoral Training. A university-based centre offering structured doctoral programmes in a specific subject area.

EngD: Engineering Doctorate. A doctoral-level programme combining academic research with industry-based experience.

Engineering culture: The shared values, norms, and behaviours that influence how engineers learn, work, and interact.

Ethnic minority: Alternative term for minority ethnic, often used in US contexts.

HE: Higher Education

HEI: Higher Education Institution

Institutional culture: The collective norms, values, beliefs, and assumptions that are shared among members of an institution and that influence behaviours, interactions, and decision-making processes.

Minority ethnic: Preferred term for ethnic groups underrepresented in UK. Used throughout this thesis instead of “BAME” or “BME.”

PGR: Postgraduate Research. A PGR student is a doctoral-level student conducting original research, usually as part of a PhD or EngD programme.

Sponsorship: A formal relationship where a senior figure actively supports a junior colleague’s career development.

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