Outreach, Selection, Retention:

A Critical Examination of Widening Participation Mechanisms in UK Medical Education

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Abstract

While recent years have seen the gradual diversification of the field, medical education in the United Kingdom (UK) continues to face issues recruiting individuals from low and representative socioeconomic backgrounds. Widening participation (WP) programmes aim to ameliorate this by enacting mechanisms to support matriculation of such students. However, the function of many of these mechanisms in medical education is not well explored in the literature. As such, this doctoral work aimed to fill some of the gaps in WP research by critically examining these mechanisms.

Firstly, this work examined outreach as the broadest form of WP, via a grounded theory, qualitative exploration of the phenomena of anatomy outreach, as a specific subfield of medical education outreach. The following portions then examined a more specific form of WP in UK medical education: Gateway to Medicine years. The 'selection' component examined how modifications to selection and curricula can impact normal ways of working, using normalisation process theory to understand implementation of a Gateway to Medicine year. This study utilised mixed-methods surveys as data collection. Finally, the 'retention' component examined the lived experiences of students who matriculate via Gateway to Medicine years. A Bourdieusian theoretical framework was applied with thematic analysis to explore how field modification interacted with student progression.

Findings indicate that outreach has a large WP potential, but is still limited in reach, appraisal, and understanding of scope. As such, 'safety nets' of alternative selection routes to medicine, such as Gateway years, are warranted. However, creation of such routes needs to consider the toll these programmes can have on their faculty, staff, and students. Through novel methodological approaches, this work has implications for improving WP practice and policy, as well as theoretical understanding of mechanisms to improve diversity, equity, and inclusion in the field of medical education.

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List of Contributions from this Doctoral Work

These contributions are highlighted as they demonstrate commitment and contribution to field via this doctoral work.

Publications

Dueñas, A., Tiffin, P. A. & Finn, G. 2021. Understanding Gateway to Medicine Programmes. The Clinical Teacher.

The candidate was the lead author of this publication, and responsible for writing it. The role of the co-authors involved structuring, editing, and oversight of the work. Portions of this work are included in Chapter 2, Chapter 3, and Chapter 4 of the present work.

Laughey, W. F., Brown, M. E., Liu, **A., Dueñas**, A. N. & Finn, G. M. 2021. Love and Breakup Letter Methodology: A New Research Technique for Medical Education. Medical Education, 00: 1-7. https://doi.org/10.1111/medu.14463

Laughey, W. F., Brown, M. E. L., **Dueñas, A. N.**, Archer, R., Whitwell, M. R., Liu, A. & Finn, G. M. 2021. How medical school alters empathy: Student love and break up letters to empathy for patients. Medical Education, 55, 394-403. https://doi.org/10.1111/medu.14403

These two pieces were coordinated by the first author, WFL. As a contributing author, the candidate participated in data collection, writing portions, and editing the pieces prior to publication. The methodology piece, specifically, includes portions of work related to Chapter 9, where the love and breakup methodology was utilised for the present work. Love and breakup letter methodology, to the knowledge of the authors, had never before been used in a medical education setting. The use of this methodology in this doctoral work provides new insights for research, as well as evaluation, in the field.

Presentations

Dueñas, A., De-Alker, E., Tiffin, P. A. & Finn, G. 2020. Gateway to Medicine Programmes: Disrupting and Diversifying, for better? An Examination of Student Experiences. ASME Annual Scholarship Meeting: Disrupting Medical Education, 2020. [Cancelled due to COVID-19]. https://onlinelibrary.wiley.com/doi/10.1111/tct.13238: The Clinical Teacher.

The candidate was the lead author of the work and writing of this abstract. EDA contributed to data analysis, and the other co-authors contributed to structuring and editing of the work. Portions of this work relate to Chapter 9. Unfortunately, this conference was cancelled due to COVID-19, but abstract materials were still published.

Dueñas, A., Tiffin, P. A. & Finn, G. "There's no way that I'm going to rock up to a pub now with a pig heart:" Anatomy Outreach During COVID-19. American Association for Anatomy Annual Meeting at Experimental Biology 2021, Virtual, 27-30 April.

The candidate was the lead author of the work and writing of this abstract. The other co-authors contributed to structuring and editing of the work. Portions of this work relate to Chapter 7. This work was selected for a Student/Postdoc Education Research Poster Award finalist; in addition to the poster presentation, it was selected for an oral presentation in a platform session.

List of Contributions from Doctoral Training

These contributions are highlighted as they demonstrate commitment and contribution to field via this doctoral training, although not directly associated with work in this doctoral thesis. The exception to these is the first piece, which, as more generalisable and theoretical, informed present writing.

Brown, M. E. & **Dueñas, A. N.** 2019. A Medical Science Educator's Guide to Selecting a Research Paradigm: Building a Basis for Better Research. Medical Science Educator, 1-9. https://doi.org/10.1007/s40670-019-00898-9

The candidate was lead co-author of this publication, and responsible for co-writing and production of original figures. Portions of this work are elaborated on in Chapter 6 of the present work.

Dueñas, A. N. & Finn, G. M. 2020. Body Painting Plus: Art-Based Activities to Improve Visualisation in Clinical Education Settings. In: REA, P. M. (ed.) Biomedical Visualisation: Volume 8. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-47483-6_3

The candidate was lead co-author of this publication, and responsible for co-writing and production of original figures.

Dueñas, A. N., Kirkness, K. & Finn, G. M. 2020. Uncovering Hidden Curricula: Use of Dark Humor in Anatomy Labs and its Implications for Basic Sciences Education. Medical Science Educator, 30, 345-354. https://doi.org/10.1007/s40670-019-00912-0

The candidate was the lead author of the work and writing of this publication. KK contributed to data analysis, and GMF to structuring, editing, and oversight of the work.

Finn, G. M., Brown, M. E. L., Laughey, W. & **Dueñas, A**. 2020. #pandemicpedagogy: Using Twitter for knowledge exchange. Medical Education, 54, 1190-1191. https://doi.org/10.1111/medu.14242

The candidate was a co-author for this work, contributing to writing portions and editing the piece prior to publication.

Author's Declaration

I confirm that this work is original and that if any passage(s) or diagram(s) have been copied from academic papers, books, the internet or any other sources these are clearly identified by the use of quotation marks and the reference(s) is fully cited. I certify that, other than where indicated, this is my own work and does not breach the regulations of HYMS, the University of Hull or the University of York regarding plagiarism or academic conduct in examinations. I have read the HYMS Code of Practice on Academic Misconduct, and state that this piece of work is my own and does not contain any unacknowledged work from any other sources.

Chapter 1:   Introduction to Thesis

1.1   Chapter Introduction

This doctoral thesis focuses on mechanisms of diversification, widening participation (WP), and widening access (WA) to medical education. From outreach to selection to retention, it provides new perspectives from facilitators, faculty and staff, and students, on how WA/WP functions to support students from underrepresented backgrounds in pursuing a medical degree and career.

This first chapter provides context for this work, describes in brief the focus and rationale, as well as an overview of the broad aims. The structure of the thesis then follows, ending with a summary leading to the first chapter of the background literature review.

1.2   Context

This doctoral work, conducted in a medical school in the United Kingdom (UK), critically examines the system of medical education in this country, and the more recent attempts to make this career more equitable, inclusive, and representative of the social diversity in the UK (Garlick and Brown, 2008; Apampa et al., 2019).

Historically and globally, medical education has been perceived to be an elite educational pursuit (Boursicot and Roberts, 2009), with colonial (Bleakley et al., 2008) and patriarchal (Sharma, 2019) roots that have been slow to be uprooted, even in the last century of medical education reform and regulation (Markowitz and Rosner, 1973). In the UK, since the introduction of formal regulation and licensing in the mid-1800s, 'professionalisation' of medicine has contributed to the field being an exclusive and elite profession (Boursicot and Roberts, 2009). The legacy of this system was maintained, until the last 30 years or so. Following from calls to make higher education in the UK more accessible (Wise, 1997; Angel and Johnson, 2000), widening participation (WP) became a more prominent focus in medical education as well (Lowry, 1992). WP can be defined as the process of encouraging, and removing barriers for, underrepresented groups to apply to higher education (Apampa et al., 2019).

Despite this commitment to WP, data in the last decade highlighted that medical education had fallen behind other higher education subjects in the UK in terms of WP and ensuring fair access. In light of these findings, the Medical Schools Council (MSC), representative body for UK medical schools, launched the 'Selecting for Excellence' project in 2013, to explore issues around navigating the academic demands of medical education, while considering equitable selection (Medical Schools Council, 2018c). In 2014, the MSC released the Selecting for Excellent Final Report, highlighting findings and making recommendations for medical schools, and regulators (Medical Schools Council, 2014b). Since then, there have also been annual reports from the MSC Selection Alliance working group, commissioned from this work (Medical Schools Council, 2018e; Medical Schools Council, 2019b). The final report highlighted that specifically students from lower socio-economic (SEC) backgrounds continued to be underrepresented in medical education; the recommendations from this report were extensive, but included: need for better SEC demographic data from medical students, improving scope of medical education outreach, expansion of contextual admissions as a selection tool, and provision of more support during medical education to WP background students. Unfortunately, the Selection Alliance 2019 Report, while demonstrating overall increase in entrants to medical school from low SEC backgrounds, still highlighted that the representation of this group remains small (Medical Schools Council, 2019b). The Selection Alliance 2019 Report makes note of data in coming years, related to Gateway year courses, with many starting in 2018, although these programmes have existed since the early 2000s. Gateway to Medicine years (Gateway years), are specified entry routes to medical education, that only accept students from 'WP-backgrounds', those from low SEC backgrounds and other WP measures (Medical Schools Council, 2018a; Curtis et al., 2014a). Gateway years also accept lower prior academic achievement, compared to standard entry medical courses, but they add an additional year (the Gateway year) to the medical education of these students (Curtis et al., 2014b).

Despite over two decades of commitment and action, medicine in the UK remains an educational route largely populated by those from higher SEC backgrounds (Apampa et al., 2019). While the MSC reports suggest the winds of change are blowing in the

direction of more equitable access to UK medical education, additional, rigorous research in the field of WP in medical education is warranted (Nicholson and Cleland, 2015). If large attainment gaps persist, despite changes in policy and practice to employ more forms of WP, it begs the question – why? With a more expansive evidence base, examining various mechanisms of WP in UK medical education, supporting the understanding of how such mechanisms function might contribute to their 'success' in better representation.

Thus, this doctoral work aimed fill some of the gaps in WP research by critically examining and better understanding several mechanisms of WP to medical education, particularly in the UK.

1.3   Focus and Rationale

Widening participation in medical education is the broad focus of this doctoral work. However there are a wide variety of mechanisms and programmes that can be adopted at local/school- and national-level, all designed to support WP in unique ways (Garrud and Owen, 2018). McLachlan (2005) describes three broad forms of WP in medical education, by which all mechanisms can be categorised: outreach, selection, and retention. It is with these categories in mind that this doctoral work was conducted, and is presented, as detailed below.

By conducting studies that aim to further understanding of how WP mechanisms function in these three realms, this thesis provides a breadth of perspective on mechanisms designed to support students prior to medical education, in matriculating to medical education, and as they progress through medical education. This provides a fuller scope of WP perspectives, centred on mechanisms supporting the 'journey' of a student to and through medical education.

However, this work also aimed to explore viewpoints beyond the participants, students, of WP mechanisms. As such, part of this thesis includes the views of WP facilitators, both in the forms of outreach and (modified) selection. By considering various mechanisms and various perspectives, this work adds significantly to interpretation of the function of WP in UK medical education. This also aligns with policy recommendations by the MSC Selection Alliance, as described in the previous

section (1.2), including more in-depth inquiry surrounding Gateway to Medicine years.

1.4   Thesis Aims

Further detailed in the thesis structure, described below (1.5), this doctoral work features three 'results' chapters, each presenting a study related to the WP mechanism domains: outreach, selection, and retention. There are more specific aims and research questions presented in each results chapter, as they relate to study details, but the overarching aims of this doctoral work are as follows:

- Understand how field-specific outreach functions and supports widening participation to medical and higher education.
- Examine how altering means of selection and entry to medicine effects the traditional and 'normal' ways of working in a medical education.
- Explore the lived experience of students who matriculate and progress through medical education via a specialised widening participation route.
- Consider the interaction of outreach, selection, and retention mechanisms in supporting widening participation to medical education.

1.5   Structure of Thesis

This thesis is comprised of eleven chapters, including this introduction chapter, designed to present background and a review of the literature, overarching theory and methodology, specific results, and an integrated discussion. These chapters are organised as follows:

Chapter 2: The 'What' – The Lexicon of Widening Participation

The first chapter of the background literature review orients the reader to the 'what,' with in depth explanation of the lexicon of widening participation. Distinctions between outreach, widening participation, and widening access are made. Additionally, the terminology of diversification is explored, such as equity, equality, and inclusion. Establishing 'what' is meant by this lexicon is key in subsequent chapters that critically appraise the mechanisms that fall under the umbrella of these terms.

Chapter 3: The 'Why' – Widening Participation as a Social Epiphenomenon

After establishing the importance of terminology in WP work, the second chapter of the literature review focuses on the 'why' – why does WP exist in medical education? In order to understand the existence of WP, it needs to be positioned in the broader sociocultural context of societal structure in the UK, and beyond. There are systemic reasons for the underrepresentation of certain groups in different medical education systems. Understanding the reasons behind underrepresentation can then explain to some extent the purpose that WP mechanisms serve, and the inequities they attempt to address. This chapter also presents some of the 'discourses' in WP, that rationalise why it is important and in the interest of society and its health systems.

Chapter 4: The 'How' – Mechanisms to Widen Participation in Medical Education

With the 'why' determined, the literature review moves to the more specific 'how.' How do medical schools, particularly in the UK, attempt to widen participation and access to their system? This chapter first briefly explains the differences in medical education systems globally; these differences result in variance in strategies used to combat underrepresentation. Additionally, key details about medical school selection in the UK are presented, given the important links between selection and WA. Types of WP and WA are then described, and existing appraisal of such mechanisms critically examined.

Chapter 5: Conceptualising Widening Participation for Critical Examination

The previous literature review chapters culminate in the description of the conceptual framework for this doctoral work. By understanding the 'what', 'why', and 'how' by which WP mechanisms exist in medical education, the 'state' of current knowledge is established, and how this doctoral work aims to fill gaps in understanding is detailed. This chapter describes in more detail how the elements of outreach, selection, and retention will be examined, particularly considering the 'who' of WP, with identification of study populations. Research aims that will subsequently be explored in the 'results' chapters are also defined.

Chapter 6: Overarching Theoretical and Methodological Considerations

While comprised of different studies and results chapters, there are theoretical assumptions and methodological approaches that guided the entirety of this doctoral work. These elements are explored in depth in this chapter, differing from the specific methods and theories employed in subsequent results chapters. This includes more details on the: axiology and reflexivity towards the work, ontological and epistemological assumptions, overarching ethical considerations as part of methods and sources, and identification of the paradigmatic stance of the work.

Chapter 7: The Role of Anatomy Outreach in Widening Participation – A Facilitator Framework

Chapter 7 is the first results chapter, and presents views on one of the broadest forms of WP: outreach. More specifically, this chapter focuses on anatomy-related outreach, as a field-specific form used to promote interest in medical and health professions education. In this chapter, the views of anatomy outreach facilitators are presented. Grounded theory is used to generate a conceptual model that aims to show how anatomy outreach functions, and is believed to support widening participation to medical education.

Chapter 8: Implementing a New Widening Participation Programme and Means of Selection – Faculty and Staff Perspectives

This second study presented in this doctoral work continues on with the 'facilitator' perspective, but looking at a more specific form of WP: Gateway to Medicine years. This chapter examines staff and faculty views on implementing a Gateway year within an existing medical education structure, as modifying selection *and* curriculum to specifically support WP. This work uses an implementation science theory via two iterations of multi-methods surveys to provide depth to the understanding of this process.

Chapter 9: Progressing in Medical Education via a Gateway Year – The Student Experience in Widening Participation

In the final results chapter, progression and retention are the focus, taking a qualitative approach to understand lived experiences of students. The WP mechanism of focus continues from the previous chapter, with current and former Gateway to Medicine students interviewed to explore their perspectives on matriculating to medical education via this specialised WP route.

Chapter 10: Overarching Discussion

Conclusions and key findings from the previous chapters are synthesised and discussed in conjunction in this overarching discussion chapter. The implications from each study, and the insights they provide to the different broad approaches to widening participation are explored. This includes exploration of the fourth broad aim of this thesis: understanding the intersection of outreach, selection, and retention on supporting WP in medical education. This chapter also notes recommendations for policy and practice, and the limitations of the thesis as a whole. Future directions arising from this body of research are also suggested.

Chapter 11: Thesis Conclusion

The final chapter in this thesis aims to summarise the entirety of this doctoral work. This includes noting the original contributions of this piece to theory, knowledge, methodology, practice, and policy within the field of medical education, and beyond. And finally, the thesis culminates in concluding personal remarks.

1.6   Note on Organisation of Thesis

There are a few notes to the above structure, that will aid in interpretation of this work, and should be established at the onset. First is the use of first person, and its role in this thesis. While it is traditional in scientific writing to rely entirely on use of third person (Webb, 1992; Tang and John, 1999), this thesis on occasion will employ the first person. This is most notable in Chapter 6, where theoretical orientation is discussed, and throughout chapters where reflexivity is utilised. As is explored in Chapter 6, while there is scientific tradition to view a researcher as objective and removed from their observations, it is the position of this researcher that is seldom true. The selection of research focus, theoretical and paradigmatic beliefs, and methodological choices that researchers make are often quite personal, and shaped

by individual interest, educational background, prior experiences, and circumstance. As such, I believe that it is important and in good practice to occasionally employ first person narrative to clearly explain positions and choices that underpin research. This viewpoint is also shared in certain circles of academia (Webb, 1992; Hyland, 2002), particularly as it relates to qualitative research (Yilmaz, 2013), which is the prominent methodology of this thesis.

Similar to the use of first person narrative, it is also important to note that when referring to myself in third person, I will use this 'researcher', 'author of this thesis', and 'primary researcher', at various points. The choice of different terminology relates to the many faceted roles of being a researcher, and undertaking doctoral work. All of these terms describe myself, but vary depending on how I am writing about my relationship to the research. Am I writing about my literature review? Am I describing the study design? Am I discussing analysis contributed to by a group? The differences in actions are subtly reflected in terminology used to describe myself.

The final note on the organisation relates to the presentation of the results chapters (Chapters 7-9). Here, these chapters are organised to illustrate the 'journey' of WP-background students, and the mechanisms in place at different 'levels' to support progression and diversification. This 'journey' starts with attempting to make connections via outreach, to modifying selection structure (and in the case of the present work, also modifying curriculum structure in conjunction with this), culminating in what may be most important- the lived experience of these students as they make their way through the medical education system.

And yet, this logical structure and presentation does not reflect the chronological occurrence of the research. It was the lived experiences of students, and their insights that in part inspired the other works. In Chapter 9, students expressed gratitude for two factors that resonated with myself as a researcher and educator: a) anatomy as a valuable experience in medical education, and b) the positive impact of dedicated and supportive faculty and staff. Ruminating on these elements helped inform the decision to look at mechanisms in the spheres of outreach and selection, but from different perspectives to students. The outreach chapter thus aimed to

specifically look at anatomy outreach, and the perceived value of this experience in the field, but from the perspective of anatomist facilitators. It was also determined to have the selection chapter take on the perspective of 'dedicated' staff, to examine their views on implementing and managing a resource intensive WP programme, that extended beyond selection changes. So, while this work is presented somewhat 'linearly' in terms of the student journey, and as a series of separate investigations to different mechanisms, there is depth to the connection of these works, and ultimately the insights they provide to the field of WP in medical education.

1.7   Chapter Summary

This initial chapter of this thesis provided a bit of context and rationale of the work to come. The overarching aims have been provided, and the structure and overview of each subsequent chapters detailed. The next chapter will detail the specific definitions and distinctions of terminology already introduced above, and as associated with the focus of this thesis: widening participation.

Chapter 2:   The 'What' – The Lexicon of Widening Participation

2.1   Chapter Introduction

There is a plethora of terms that are often used interchangeably, or incorrectly, when discussing 'widening participation.' This first chapter of background literature review aims to clearly establish definitions and distinctions for key topics that fall in the category of 'diversity-oriented' work, as does WP.

Such distinctions are key in establishing a shared lexicon between the author and readers of this thesis, to ensure that the subsequent discourse is being applied appropriately and communicated clearly. The purpose of this chapter is introduction of the lexicon; in the next chapter, these terms will be interpreted with a contextual lens, to explore discourses around diversification in medical education.

2.2   What is 'diversity'?

In the current climate, discussions about 'diversity' are commonplace not just in medical education (Chiavaroli et al., 2020; Nivet, 2015), but in many facets of society (Sklar, 2016). Diversity is also often associated with equity and inclusion, with the acronym of 'EDI' or 'DEI' used to represent the combination of these terms, and associated efforts to support them (Schuster et al., 2020). However, these terms are distinct, each serving different purposes.

Diversity, or the state of being diverse, often focuses on the representation of individuals from a range of different social backgrounds; this may include from different races, ethnicities, ages, (dis)abilities, and genders (Chiavaroli et al., 2020; DeLisa and Lindenthal, 2012). It may also include what are sometimes described as less 'visible', or deep dimensions, such as religion, sexuality, neurodiversity, and socioeconomic status (Chiavaroli et al., 2020; Young et al., 2012). In medicine, demonstrating 'diversity' is typically defined with numbers, showing the percentage of representation by individuals from various backgrounds, with focus on those who have been traditionally underrepresented in medicine (Fernandez, 2019; Razack and Philibert, 2019). This notion of 'underrepresentation' will be revisited later in this chapter, and in Chapter 3, when discussing who may be viewed as 'underrepresented' in different societies. However, in recent years, there has been a

call to move diversity beyond a mere numeric demonstration, to a broader definition of 'diversity' that provides a framework for conducting quality medical education (Nivet et al., 2016). As such, diversity and representation may only reach their full potential if accompanied by other elements of EDI, such as inclusion.

2.2.1   Diversity and Inclusion

There is a common, colloquial quote about diversity and inclusion that aptly describes the distinction between these two terms, "diversity is being invited to the party, inclusion is being asked to dance" (Myers, 2015). This helps to illustrate how diversity, and representation by numbers, is limited if those 'invited' have no true participatory powers (Olzmann, 2020). As such, diversity efforts need to be accompanied by inclusionary action.

Inclusion should also be noted as distinct from 'belonging,' although belonging can be a factor that promotes inclusion (Shore et al., 2011). Here, another simple saying can help illustrate the difference, "Diversity is having a seat at the table, inclusion is having a voice, and belonging is having that voice be heard" (Burgin, 2019). Belonging is an experience of being accepted and valued, and requires respectful and true inclusion to be obtained by diverse individuals (Roberts, 2020).

Without respectful inclusion and belonging, diversity is not ensured to lead to positive impact, and can potentially be more harmful than helpful. Lack of belonging can contribute to isolation, emotional distrust, exhaustion, depression and mental health challenges in underrepresented or minority individuals (Arday, 2018), often contributed to by discrimination, bias, and microaggressions (Roberts, 2020; Mateo and Williams, 2020). This can lead to alienation of individuals from underrepresented groups (Beagan, 2005), and potentially perpetuate their underrepresentation (Orom et al., 2013). And yet, inclusion, and subsequent belonging, is also very challenging to interpret and measure (Roberts, 2020). Where diversity can be somewhat easily numerically demonstrated, there is no consensus on best practice to easily understand inclusion and belonging.

2.2.2 Equity versus Equality

'Equity', the other component of EDI, is perhaps the most complex. This is contributed to by 'equity' often being misinterpreted or misused with 'equality.' But, as already demonstrated, the vernacular of EDI is strife with phrases attempting to simply convey meaning; equity and equality are often also metaphorically described (Gutoskey, 2010). Imagine a group of individuals, of varying heights, trying to reach up to the branches of a tree, to pick apples. Perhaps the tallest can just reach the apples, and the shortest in the group are not even close. Equality would be giving each individual a box (of the same size) to step on to reach the apples; the tallest can now pick with ease, some in the middle may be able to just reach, but the shortest will still not be able to harvest. Equity, would be considering the height of the individuals, and providing boxes based on this; the tallest may not receive a box, but the shortest might receive two. In this 'equitable' scenario, all individuals can reach the apples. Here, it is easy to see how 'equality' concerns the same measure, quantity, or amount of a resource provided, whereas 'equity' involves some sense of 'fairness' in provision for all. However, this simplified metaphor does not consider how 'equitable distribution' is largely determined by one's philosophical beliefs about 'fair' distribution (Pereira, 1993). Following the above metaphor, is it actually 'fairer', in a world of limited boxes, to provide all individuals with just one? Or should boxes be provided to those who are already best at picking apples, to produce a greater apple crop? Will all apples picked be then distributed 'fairly', or do individuals get to keep all they gather and distribute at their own discretion? The idea of 'fairness' in determining equality and equity is complex, even in a simple metaphor of apple-picking.

This complexity of equity, more generally, but also in terms of educational equity, has also been described in medical education (Tiffin et al., 2018) and higher education literature (Jones and Thomas, 2005; Archer, 2007). Equity is of particular concern when considering diversity and representation in student selection, in a competitive higher education system, like medicine (Razack et al., 2012; Kuper, 2016). Tiffin et al. (2018) conclude from different philosophical considerations of fairness that 'fairness' and equity in medical education should consider not just the

fair or 'equal' treatment of individual applicants, but the needs of patient groups, and of the profession. This is an interpretation and extension of Sen's philosophy of capability (Sen, 1993); this model proposes opportunity, or distribution of equity, should be weighted towards those most 'capable' of contributing to society. This multi-faceted perspective on equity is what will be applied in this doctoral work, due to its potential to address the issues of widening participation (Sandars and Sarojini Hart, 2015).

2.2.3   Underrepresentation

As mentioned above, the basis of diversity-oriented work centres on the idea of representation: who has 'a seat at the table', and are the demographics of those at the 'table' representative of the wider population? This means the focus of much EDI work involves, at minimum, identifying who is 'underrepresented', so that they might be targeted to 'join the table.'

This doctoral work frequently refers to certain groups as 'underrepresented', which can, for the purposes of its scope, be interpreted as underrepresented in medicine (URiM), or medical education (Bonifacino et al., 2021). Other terms used in the literature include 'traditionally underrepresented in medicine', denoting a variety of groups, that in the history of the profession, have been underrepresented (Grabowski, 2018). Another frequently used term, particularly in the United States, is underrepresented minority (URM), referring to specifically racial or ethnic groups that are underrepresented (University of California San Francisco, 2018). This is similar to the UK ethnicity descriptors of Black, Asian, and Minority Ethnic (BAME) or Black, Minority Ethnic (BME) (AdvanceHE, 2020b). However, BAME and BME have been more recently recognised as 'problematic' terms in description of identity and underrepresented groups (UK Race Disparity Unit, 2020; Morris, 2020), despite their continued use. They tend to be used as 'catch-all' terms used to try and describe very diverse groups of individuals. This re-consideration of terminology has also been applied to the term URM, when used in discussions of race and ethnicity. Like BAME/BME, URM is viewed to group together very diverse populations, which may or may not be 'underrepresented' in given systems (Utah Division of Multicultural Affairs, 2019). Further, URM is regarded by some as 'racist' language (Williams,

2020), as it denies certain groups the power to name themselves, and can perpetuate master-slave language between 'overrepresented majorities' and 'underrepresented minorities'. Some individuals opt instead to use the term 'minoritized' (Wyatt et al., 2021b), to demonstrate the role of systemic racism as the root cause of minoritsation for these constructs.

In considering all of this, the present work aims to be as specific as possible when identifying 'underrepresented groups' in subsequent chapters. Predominately, the term 'underrepresented' in UK medical education will refer to individuals from lower socioeconomic backgrounds (the reasons for this detailed in Chapter 3, see 3.2.1). Underrepresentation often depends on the characteristics of a social arena, and therefore can be closely linked to geography and locality. These elements, and how they relate to underrepresentation and WP, are explored more thoroughly in the next chapter. However, while specific constructs of underrepresentation will be focused on, it would be remiss to not recognise here the coalescence of different identities, in intersectionality.

2.2.4 Intersectionality

Notable in considering underrepresentation is the notion of intersectionality, or the multiple identities that all individuals can hold (McLean, 2012), and the associated 'representation' with each identity (Chiavaroli et al., 2020; Monrouxe, 2015; Eckstrand et al., 2016). For example, in UK medical education, an individual might identify as a white male, and as from a relatively disadvantaged socioeconomic background. In considering this person's identity in terms of race and gender, they would not be considered from a traditionally underrepresented group in medicine (Boursicot and Roberts, 2009). However, when taking into account their socioeconomic status, they would then be considered 'underrepresented' in medicine (Apampa et al., 2019), and as such, an individual who may benefit from EDI initiatives, such as WP, to support them in applying and matriculating to medical education. Therefore, considering intersectionality, and being explicit on how different characteristics might be associated with 'diversity' is key in the field of widening participation.

2.2.5   EDI, In Summary

With the many metaphors and definitions above, it is worth concretely summarising how this doctoral work defines each of the above terms. Table 1 provides a table with this terminology, both broadly, and in terms of medical education, particularly in the UK. Understanding these terms is key in applying them to the concept of 'widening participation', which is better defined and described in the rest of this chapter.

Table 1: Definitions for EDI Terminology

Term	Definitions	Definition, specific to medical education (In the UK)
Diversity	State of being diverse, having representation of different social backgrounds	Having medical students and medical school faculty/staff that represent different social backgrounds, particularly from a range of economic social backgrounds
Inclusion	State of being included within a social system or group	Creating medical education systems that supports and provides opportunities to all students, including those with less access to financial resources
Belonging	To be included as a member of social system or group, and feel accepted/valued	Having individuals from lower socioeconomic background feel included in medical education activities, and not as 'other' or stigmatized due to lower income background
Equality	Distributing resources in equal manner, based on amount, quantity, etc.	Providing all medical students the same access to financial support for education, like bursaries or scholarships
Equity	Distributing resources in a 'fair' manner, that considers individual and societal needs	Limiting medical students who can apply to certain financial support for education, like bursaries or scholarships, to those from lower socioeconomic backgrounds, who may have greater 'need' for financial support
Underrepresented	Insufficient representation of social groups in a social system, not proportional of those observed in the general population from which they are drawn	Medical education in UK is still largely dominated by those from higher/privileged economic backgrounds; people from lower socioeconomic backgrounds are underrepresented in medicine, compared to similar individuals in these groups, across the nations
Intersectionality	Interconnected nature of 'identities' and types of social background in a given individual or group	Intersectionality makes consideration for the intersection of those from lower socioeconomic backgrounds (underrepresented in medical education), and other identities (such as gender, where females are no longer underrepresented in undergraduate medical education, but continue to be so in leadership positions)

2.3   What is widening participation?

Widening participation (WP), as diversity-oriented work, is the focus of this thesis. WP is a commonly used term in UK higher education, becoming a key feature of government agenda in the last few decades (Archer, 2007; Jones and Thomas, 2005). It is generally understood as practice and policy designed to encourage proportional representation (participation) of the public in higher education (Nicholson and Cleland, 2015; Patterson and Price, 2017; Al-Jabir, 2018). WP practices are typically delivered through higher education institutions, but with some oversight from public bodies such as the Office for Access and Higher Education Funding Council for England (Connell-Smith and Hubble, 2018). In the UK, current WP practices tend to focus on ensuring students from lower socioeconomic (SEC) backgrounds have fairer access to education, including medical education (Apampa et al., 2019). This was noted in the above example of intersectionality (2.2.4). 'WP-background' students will be a term this thesis uses, to refer to students from lower SEC, identified as the 'targets' of UK medical education WP initiatives. This term is designed to denote a broad student population, with many intersectional identities, but who also demographically fall into categories of WP-targets, or being from a lower socioeconomic background. It is also worth noting that while this thesis uses the term lower SEC, classifications for income measures in the UK are sometimes referred to as socioeconomic status (SES), or as the National Statistics Socioeconomic Classification (NS-SEC) (Office for National Statistics, 2021).

There is no singular measure for what determines if an individual is from a 'WP-background' in the educational sense of the term, rather it is often considered to be demonstrated via combinations of measures (O'Beirne et al., 2020). However, it has been hypothesised that this use of multiple measures increases the risk of errors in socioeconomic classification, which led to the creation of a potential multidimensional measure, an Index of Widening Participation Status (Lambe et al., 2018). Still, this index has not been well-adopted by programmes or governing bodies in categorising WP-background students. Furthermore, specific programmes or WP mechanisms still frequently define their own interpretation of 'WP-background', complicating matters. However, there are some key UK indicators of

lower SEC status that will be defined here as commonly used in the existing system: educational background (public, state-funded schools/colleges), socioeconomic groups defined by parental occupation (NS-SEC), and a geographical measure of neighbourhood participation in higher education (POLAR, participation of local areas) (Garrud and Owen, 2018).

In terms of educational background, there is well documented disparities in the types of secondary (high) schooling medical entrants (and applicants) receive. In the UK, 2014 data indicated that approximately 80% of medical students matriculated from only 20% of the country's secondary schools (Medical Schools Council, 2014b; Tiffin et al., 2018; Garrud and Owen, 2018). Further, these 20% of schools were more likely to be independent (private, not state-supported), selective schools, including selective state schools, often labelled 'grammar schools' (Garrud and Owen, 2018). The differences in school type links to the potential resources and attitudes (Alexander et al., 2021) that students interested in medicine as a profession might be exposed to; based on school funding sources, there is educational inequity based on type of education, not necessarily the potential of students. To this point, there is evidence that after selection, state-educated students outperform medical student peers who received independent schooling (Kumwenda et al., 2017; Thiele et al., 2016). This potential in selection bias associated with school type and grades (Tiffin et al., 2014), as well as the role of teachers in state schools encouraging or discouraging students from medicine (Alexander et al., 2021), will be discussed further in Chapter 4 (see sections 4.4.1 and 4.3.4, respectively).

NS-SEC consists of categories for parental employment, with higher SEC associated with parents in managerial and professional occupations, such as medical practitioners, nurses, academics, journalists, and school teachers (Drever et al., 2004). This NS-SEC category represents the parental occupation of most applicants to medical school (Medical Schools Council, 2019b). Being from a lower socioeconomic background is usually associated with parents having no higher education experience (Bassett et al., 2019), and thus being in routine or semi-routine occupations, such as housekeepers, cleaners, labourers, and waiters (Drever et al., 2004).

POLAR is organised into quintiles, with 1 reflecting lowest participation, and 5 the highest. These quintiles reflect the proportion of young people, age 18 or 19, who matriculate to higher education from specific post codes, to reflect general HE participation geographically (Office for Students, 2020a). For most medical education programmes, there is a much smaller percentage of applicants and entrants from POLAR quintiles 1 and 2, with POLAR quintile 5 still representing the most participation (Medical Schools Council, 2019b).

There has been minor to moderate increases in some of these criteria representation in recent years. In their most recent report, the Medical School Council noted that between 2014 and 2019, amongst medical entrants there was a 14% increase in state-school educated individuals, 35% increase from POLAR quintile 1 areas, and 11% increase for those whose parents had no higher education (Medical Schools Council, 2019b). This report also notes a 46% increase in entrants from the lowest indices of multiple deprivation (IMD), a measure of relative deprivation, or impoverished areas. Still, these increases are incremental in considering the total population of medical students; students from low SEC backgrounds are still very much underrepresented, and even those from all non-NS-SEC 1 categories are comparably underrepresented. It is also worth noting that each of these measures may not accurately reflect the challenges an individual from a WP-background may face; the dynamics of poverty are complex, interactional, and do not dissipate with entry to medical school (Baugh et al., 2019; Southgate et al., 2017).

2.3.1   Widening Participation Distinctions

2.3.1.1   Widening Access versus Widening Participation

Widening participation is frequently discussed in the context of another term, widening access (WA). While some view these as synonymous (Patterson and Price, 2017), there are subtle differences in the definitions of these terms (Nicholson and Cleland, 2015), and therefore they cannot always be used interchangeably. Table 2, on the following page, describes these distinctions and the definitions of these initiatives, with examples, that this thesis ascribes to. To summarise, WA is about getting underrepresented groups matriculated to medical education, whereas WP is about getting underrepresented students to the point of applying to medical

education; WA is concerned with medical *student* demographics, whereas WP is more concerned with medical school *applicant* demographics. For example, many outreach or pipeline programs that exist in other countries, such as the USA (Vick et al., 2018), would be considered WP. Means of considering a broad range of applicant details, beyond academic and extracurricular performance, such as 'holistic' or 'contextual' admissions, would be a form of WA. These examples are introduced here, to provide context, but details about these mechanisms, such as outreach and contextual admissions, will be further explored in Chapter 4.

Table 2: Definitions of Widening Participation versus Widening Access

Term	Definition, broad	Definition, specific to medical education (In the UK)	Examples
Widening Participation	'Participation': the action of taking part in something	Policy and programmes designed to support aspirations, recruitment and application of individuals from underrepresented background to apply to (or wish to take part in) medical education	Outreach programmes, application-focused support, practice interviews, mentorship programmes, work experience, teacher/career advisor guidance
Widening Access	'Access': the means or opportunity to approach or enter a place	Policy and programmes designed to create fairness in the selection process, so that individuals from underrepresented backgrounds, can achieve entry to (or the means / opportunity to enter medicine) medical education	Change in selection process, contextual admissions, reserved spots for underrepresented applicants, affirmative action (eventually ruled illegal in United States)

Attempts to clarify the distinctions between these terms has also been detailed in a publication resulting from this doctoral work, as noted on the contributions page (Dueñas et al., 2021). These definitions align with other definitions from researchers in this field (Nicholson and Cleland, 2015). They are presented clearly here for communication about the scope of this thesis, but it is important to note that the definitions adopted by this work differ from how these terms may be used in the wider field. The MSC, for example, while recognising that WP can have variable meanings describes WP as "increasing the number of people from groups that have historically had a lower participation rate in medical education" (Medical Schools

Council, 2014b: 35), which aligns more with this work's WA definition. Furthermore, other public bodies, such as the Office for Students view 'access' as a variety of programs to support students, though do not clearly distinguish between this term and participation (Office for Students, 2020b). As such, this doctoral work will continue to use the terms established here for two reasons: a) they align with definitions presented by prominent researchers in the field (and this is a presentation of research); and b) that there still exists some flexibility in the semantics of these terms. As such, the present definitions, which logically make sense for the broad definitions of the words (presented in Table 2), might help further the discourse in the field, to move for clearer and defined definitions that all might adapt.

Thus, in considering this doctoral work, the focus is largely widening participation, as described in the introductory chapter, and noted in the title. However, considering 'selection' as an element of the WP focus, and WP/WA discussion, this thesis also crosses the line to what might be considering more accurately WA. Still, for simplicities sake, WP is the generic focus and term adopted throughout.

2.3.1.2   Outreach versus Widening Participation

As Table 2 indicates, 'outreach' can be considered as a form of WP. However, it should be noted that not all outreach functions as WP. Outreach in higher education can be conceptualised as just the academe 'reaching out' to provide a variety of services or activities that foster well-being, to wider communities (Johnson et al., 2019). Outreach that focuses specifically on universities promoting pathways to higher education would be considered WP. However, other forms of outreach that focus on providing non-educational services to communities would not be considered WP.

2.3.1.3   Widening Participation Plus

It is also important to consider the 'boundaries' of WP. Some believe that considering WP should not stop at application or entry to medicine, and needs to incorporate retention and progression of the students it targets (McLachlan, 2005). Some universities even adopt Access and Participation Plans (APPs), that consider

more 'holistic' approaches to WP, such as progression, inclusion (in cultures and learning/teaching), and assessment (AdvanceHE, 2020a). Further, if WP is seen as an extension of diversity-oriented work, targeting underrepresentation, then such subsequent inclusion should be considered (Baxter et al., 2015). Changing medical school cohort representation does not change the elitism in the structure of medical education. As such, WP-background students may be likely to face discrimination and disadvantage (Fyfe et al., 2020), with the potential for their attrition from the 'system.' If WP initiatives just aim to recruit but not retain, then they are not really addressing the issue of representation. Therefore, it is the position of this thesis that WP should also encapsulate student progression, and be concerned with understanding retention, not just application and selection.

2.4   Chapter Summary

This chapter has defined some of the key terminology of this thesis, defining broader terms such as diversity, equity, inclusion, then considering a facet of diversity-oriented work in widening participation. WP, and how it is distinguished from widening access and more general outreach are also described. Additionally, some key criteria in determining 'underrepresentation' for UK medical education were detailed.

With established terminology, or the 'what', the next chapter looks at the 'why' – or why such terms exist. The sociocultural influences on diversity-oriented work will be detailed, including comparing why the UK is so SEC-focused in WP, compared to other countries with similar medical education systems. Further, the discourses and justifications for WP action in medical education will be discussed, exploring more of the philosophical positions on equity, presented here.

Chapter 3:   The 'Why' – Widening Participation as a Social Epiphenomenon

3.1   Chapter Introduction

The previous chapter established the 'what' of widening participation, describing it and the diversity-oriented lexicon that surrounds it. It also described the target of widening participation in the UK as being focused on individuals from lower SEC status, particularly in medical education. This chapter delves more into *why* this particular group of individuals is underrepresented in UK medical education, describing the issues in diversity that medicine faces as a social epiphenomenon of broader issues. For comparison, diversity-oriented issues from other countries are also described, to demonstrate how geography plays a unique role in underrepresentation, and subsequently actions of widening participation.

After explaining why these issues exist, this chapter then moves to describe why it is important to address them. There are several discourses, or schools of thought, around the benefit and purpose of widening participation. This doctoral work describes them in three strands, applied more specifically to UK medical education: academic and educational enrichment, utilitarian arguments for society (healthcare), and social justice and transformative action. This section also presents the concept of medicine as a meritocracy, which can be used as an opposing view to enacting widespread WP initiatives. The chapter summary includes establishing the discursive position of this doctoral work.

3.2   Societal Inequities Mirrored in Medical Education

3.2.1   Underrepresentation and Inequity in UK Medical Education

Medicine in the UK continues to be viewed as an elite profession, dominated by those from higher SEC backgrounds (Boursicot and Roberts, 2009). The 'elitism' of medicine diminishes its ability to promote social mobility (Southgate et al., 2017), or the ability of individuals to shift in social status, including obtaining higher education (Payne, 1989; Kennedy, 2010; Boursicot and Roberts, 2009). Social mobility can be defined as the shifting of individual social status, either for good or bad; social mobility can be examined and conceptualised in many ways (Lawler and Payne,

2017), including inter-generationally, or juxta positioned by class in broader society. Compared to most other Nordic counties, as well as Australia and Canada, the UK has much lower social mobility across generations (Causa and Johansson, 2011). It is also worth noting at the onset of this section, the use of the term 'UK' that is used here and throughout this work. Medical education, and all medical schools in the UK, fall under the purview of certain bodies, such as the MSC and General Medical Council (GMC). But in this collective consideration, it is sometimes possible to forget the devolution of the UK, and the unique societal challenges that individual devolved nations (Scotland, Wales, Northern Ireland, England) may face. For example, Scotland has a large remote and rural population, which presents unique healthcare education needs, and may be an important influence in WP practice and policy that Scottish medical schools may enact (MacVicar and Nicoll, 2013). Still, given the shared UK interest on general social mobility and SEC-focus for WP, considering this as the shared overarching issue in the UK will be the focus of this doctoral work.

The limitations of social mobility and access to education in the UK can be traced back to the historical influences of generational wealth that have been commonplace for hundreds of years, but persist even in this post-industrial era (Tomlin et al., 2013; Friedman and Laurison, 2019). Historically speaking, land-owning and title-possessing individuals in the UK had the most resources to maintain high social standing. These forms of capital could also be 'passed on', contributing to systems of generational wealth and the establishment of the 'working class' (Mondon and Winter, 2019). For individuals in this class, not possessing assets such as land or titles in the UK, and being geographically limited by working in particular immobile professions (Reay, 2004), social mobility is extremely difficult. The perpetuation of generational wealth is what still contributes to inequities today; those with wealth in 'elite' occupations maintain these positions, and this allows easier access for their children to also obtain and maintain this status (Causa and Johansson, 2011). Conversely, those with no experiences in higher education and no generational wealth find it challenging to have the resources to support pursuing these paths, for themselves or their children. This can contribute to a unique culture, and often negative regards towards, the role of education amongst the British

working class (Hollingworth and Williams, 2009; Reay, 2007). This may be particularly true for medical education, given the perception of elitism of the profession (Boursicot and Roberts, 2009). As such, it logically follows that medicine in the UK will continue to have issues in underrepresentation for those from lower SEC status, if class separation persists. Widening participation attempts to bridge the gap of these social divides, by creating guidance and clearer paths to higher education from those least likely to 'see' them – those from working class, or low SEC, backgrounds.

Finally, considering other dimensions of representation, such as gender and race/ethnicity, the power of such identities is not as engrained in the historical-cultural fabric of the UK as other countries of similar status. Considerations for global differences are detailed in the next section (3.2.2). This may explain why these other dimensions have shown better increases in representation in medical education, in recent years (Medical Schools Council, 2019b), whereas socioeconomic status has remained more stagnant. As such, while there is still work to be done considering representation of these groups and reckoning with concepts of structural racism and gender-based discrimination, particularly in the broader hierarchy of medicine (Boursicot and Roberts, 2009), they do not persist as the 'priority' targets for medical education WP in the UK. However, the same cannot be said in considering the geographic influences in other countries.

3.2.2   Underrepresentation and Inequity, Globally in Medical Education

The focus of this doctoral work is largely on UK medical education, and as such, subsequent considerations for discourse and mechanisms of WP (see section 3.3), focus more so on UK practices. However, in understanding the generalisability of this work, some international context is important.

While UK inequities can be traced back to centuries of focus and concern about economic status (Friedman and Laurison, 2019), other countries have their own focuses for diversity-oriented work, again, largely influenced by sociocultural history. In the United States of America (USA), diversity often centres around discussions of race and ethnicity (Nivet, 2010; Nivet, 2015). This can be traced back to the influences of slavery, immigration, and segregation (Mondon and Winter, 2019) in

this 'younger' nation. Canada, Australia, and New Zealand, despite having different systems of medical education (discussed in the next chapter, section 4.2), share some diversity-focuses. All these countries make considerations for the representation of Indigenous peoples (Deravin et al., 2018; Middleton et al., 2019; Mian et al., 2019), or Aboriginal (Australia), Māori and Pasifka (New Zealand), and First Nations, Inuit, and Métis (Canada) people. They are also concerned with providing access to higher, and medical, education to those from more rural backgrounds (Tesson et al., 2005). Both of these concerns are related to the history of settlers and geographic nature of these countries (large, with regions of lower populations), although rural underrepresentation is also seen in many smaller countries, such as South Africa, Sudan, and Philippines (Larkins et al., 2015).

While discussed here in brief, these international examples demonstrate how knowing the history of a country/region is important in understanding the focus of diversity, and subsequently widening participation. Further, it may be important in interpreting what mechanisms are used to address widening participation, and how they are considered 'effective.' For example, a strategy to go into rural communities to share information about medical education may be considered potentially very effective in a country like Canada or Australia. However, if this same strategy was employed in the UK, but did not consider the wealth or POLAR code for these communities, it might not be considered to be the best use of resources.

Lastly, it is worth returning to the concept of intersectionality, introduced in the previous chapter (2.2.4). While this section on societal inequities focused attention on the *primary* focus of countries' diversity-oriented work, there are often numerous factors to consider, and it is not quite as simple as targeting single, disadvantaged groups (Ko and Ton, 2020; Fernández et al., 2020). For example, in the USA, while racial and ethnic inequities are a dominant issue in the country, its geographic diversity and size means that in some regions, concerns about how to support rural or even urban participation in medical education takes priority (Goodfellow et al., 2016). The USA also has Indigenous groups (Native Americans, American Indians, Alaska Natives), underrepresented in medicine, with specific educational programs to recruit individuals from these backgrounds (Ballejos et al., 2018), often considered

differently than other racial and ethnic groups. The UK is also not immune to these intersectional considerations; for example, just as in the USA, the UK also has issues around racial and ethnic xenophobia and racism (Bhala et al., 2020). So, while not the primary focus of this work, the interconnected nature of identities, and the numerous groups that can be considered to be marginalised in medical education, is important to bear mind in the interpretation of this doctoral work, and any approach to WP.

3.3 Discourses around Widening Participation and Diversification in Medical Education

The previous section (3.2) outlined why issues in representation and inequities in medical education *exist* in the UK, and other countries. This section will now describe some of the discourses that explain why *addressing* such inequities is important. Discourses, a common term in sociology and the humanities, describes certain established ways of thinking and acting on certain topics (Razack et al., 2012). While this thesis does not employ formal discourse analysis (Hodges et al., 2008), describing some of the primary diversity and WP discourses in medical education is important in understanding what underlying goals of WP mechanisms may be, and subsequently how they may be critically appraised.

Before discussing the three broad discourses that can be interpreted as in favour of WP, this section first describes the idea of medicine as a meritocracy. For those who ascribe to meritocratically oriented ideals, widening participation may need not exist in the capacity it does. Obviously, that is not the position of this doctoral work. However, it is still important to recognise this viewpoint, for its cultural influence within medical education.

3.3.1 Medicine as a Meritocracy

A meritocracy is a system in which individual success is determined by ability. In 'democratic' countries in particular, the idea that social systems are meritocracies, where anyone with skill and will can be a success, is a common ideal (Friedman and Laurison, 2019). This is mirrored in the system of medical education in the UK and similar countries with meritocratic ideals; a place in medical school is obtained with a

'fair' application, whereby individuals are granted entry based on prior educational attainment and potential aptitude for medicine (demonstrated skill and will) (Razack et al., 2020). While not innately negative, the notion of a true meritocracy in medicine can make the argument that widening participation need not exist, as anyone who is determined enough, has the 'will and skill', can be successful in applying to medical education; representation and historical implications of privilege need not be considered, otherwise they might sway what is a fair and impartial system.

Particularly in more 'elite' universities and medical schools, this viewpoint may be adopted, with terminology like 'best and brightest' being used to describe individuals from disadvantaged backgrounds who are still able to achieve medical school entry (Razack et al., 2012), evoking notions of the 'deserving poor' (Watkins-Hayes and Kovalsky, 2016) and 'diamonds in the rough' (Nicholson and Cleland, 2015). These individuals were the most determined, and therefore the system of a meritocracy ensured them a place to study medicine. Further, some may believe that WP threatens medical education, by lowering academic standards to consider diverse populations of students (Nicholson and Cleland, 2015; Coyle et al., 2020), resulting in disruption of a true meritocracy. Views balking at the notion of contextual and holistic admissions, beyond academic ability, have even been expressed in the wider media (The Times, 2019).

However, the idea of medicine as a meritocracy has recently been described as an educational and cultural myth (Razack et al., 2020). As Razack and colleagues state, "The use of the term 'myth' here, then, is not to state that assessing merit is a myth, but rather to postulate that narratives guide how excellence is constructed in our discourse and decision-making processes" (Razack et al., 2020: 47). Indeed, this is the shared position of this doctoral work. Medicine as a meritocracy is problematic for two major reasons: a) it does not consider the role of innate privilege, and b) it can often contribute to deficit models of education being applied in the WP setting.

To the first issue, imagine a wealthy individual (Student A), attending a privately-funded secondary school. There are well-trained career advisors in this school, able

to guide the individual in the medical school application process; each year they successfully aide at least a dozen students in this process, and the school has many medical student alumni. If this student does struggle with grades, small class sizes and teacher contact time can help support them in gaining eventual higher grades; their predicted grades may even be higher, due to the private education, increasing their chances of obtaining an interview or medical school. Student A can also afford to pay for additional private tutoring for the UCAT (University Clinical Aptitude Test, formerly the UKCAT, UK Clinical Aptitude Test), the admissions test required for entry to most UK medical schools. One of their parents is a doctor, and helps them prepare for interviews by regularly discussing the career and relevant issues in the profession. Student A and their family have the financial means to drive and stay in hotel accommodation the night before all their interviews.

Compare this scenario to an individual (Student B) from a state-funded school, with no career advisor, and no alumni who have ever matriculated to medical school. The class sizes are much larger, with low teacher to student ratios, and overall, the school produces lower predictive grades. Student B cannot afford preparatory materials for the UCAT. Their parents are in the service industry, and did not attend university. One of their parents may be supportive, driving this student to medical school interviews, but the family cannot afford accommodation, so they must make the journey the day of.

It is simple to see here, that economic privilege can be a huge influence in having sufficient support to apply to medical education with ease. These examples make no mention of individual skill or desire, and both of these people may be excellent candidates for medical education, eventually becoming great doctors. But skill or desire is the baseline, with the former example demonstrating how much economic context can inform actual success. The idea of a meritocracy completely ignores this context.

To the second issue of meritocracy, even when some considerations are made for background of individuals, these can contribute to the idea of deficit models of education. From the previous example of Student A and B, medical school

admissions tutors and staff may conflate Student B's lack of preparedness, or potentially worse state-school grades, as a sign that this student may benefit from some form of academic 'topping up'. This may be the viewpoint of these individuals, if influenced by meritocratic ideals, despite evidence that school grades are not the best predictor of actual medical school attainment (Kumwenda et al., 2017; Tiffin et al., 2014; Mwandigha et al., 2018). These attitudes can then support the notion of deficit model education, that individuals from diverse backgrounds have deficits that need to be addressed, to be up to the 'standard' or ideas of excellence, associated with meritocratic thinking. However, as mentioned previously, this ignores evidence that: a) this is not often supported by data on student performance, b) this can be detrimental to students identified as needing 'topping up' from a more psychosocial perspective, and c) it ignores all the surplus of ways in which diverse students benefit both medical education and, ultimately, healthcare.

To this point, the next section explores alternative discourses, that provide reasons that WP *should* be supported, for the benefits that diversifying student populations can offer when a meritocratic system is modified.

3.3.2 Discourses for Why Widening Participation is Important

This thesis organises the discourses in favour of WP in medical education into three broad streams, modelled from literature in higher education (Jones and Thomas, 2005). Medical education WP can be seen advantageous by: offering academic and educational enrichment, potentially providing utilitarian benefits for healthcare, and ensuring social justice and transformative action for those it supports. While these are presented separately, it is possible that individuals and organisations may ascribe to multiple or all of these viewpoints, when rationalising their promotion of WP.

3.3.2.1 WP as Academic and Educational Enrichment

WP can act as a means to raise academic aspirations, thereby increasing the number of applicants and matriculants to medical education. Following the example of Student B from the previous section; it could be in the purview of WP to provide programmes to that individual's state school, so that it is not just Student B applying to medicine, but also numerous peers. As more students from that school may

matriculate to medicine, it may be a more commonplace attitude that medicine is 'achievable' by those in the school, promoting more academic support to interested students (Mathers and Parry, 2009); for example, the school might find resources to invest in hiring a careers advisor. Thus, WP acts as academic enrichment to schools and society, and particularly outside of post-secondary systems.

And the potential educational enrichment of education does not just apply to pre-medical experiences. Via WP, medical schools can also benefit academically and culturally. There is a growing body of evidence that having more diverse cohorts can benefit all students in a variety of educational tasks (Antonio et al., 2004; Murphy et al., 2020). In medical education, the benefits are notable for exposure and training that ultimately considers culturally conscious healthcare, that may benefit wider populations of patients (Whitla et al., 2003; Guiton et al., 2007; Morrison and Grbic, 2015).

However, there are criticisms of this discourse. Primarily, it can ignore the complexities and obstacles that individuals can face in life outside of their educational pursuits, or the best practices for recruiting diverse individuals (Morrison and Grbic, 2015). WP programmes do not negate all the multitude of challenges and responsibilities that individuals face in applying to, and while in, medical school. It also runs the risk of putting burden on minoritised individuals, to act as a 'spokesperson' (Whitla et al., 2003), or cultural educator to their peers. Additionally, putting too much focus on educational enrichment can also contribute to deficit model ideas on education, as discussed in the above meritocracy section (3.3.1). 'Enrichment' can be conflated with the ideas of 'topping up', thus creating or reinforcing the idea that certain educational establishments and individuals passing through them may always be deficient, compared to others.

3.3.2.2   WP as a Utilitarian Argument for Healthcare

The utilitarian argument for WP considers what is best for the greatest number of people. In considering medical education, and the 'purpose' this system serves is creating a workforce of competent doctors (Frenk et al., 2010). The utilitarian viewpoint considers that WP can be beneficial in recruiting the best future workforce

to serve the greatest number of patients (Komaromy et al., 1996). This is often described as the 'social accountability' of medical schools (Rourke, 2013).

Globally, and in the UK, there exist medically underserved communities, and specialities of practice (Rabinowitz et al., 2000; Goodfellow et al., 2016). This contributes to healthcare and workforce shortages. Thus, medical schools should consider regional healthcare needs in producing, training, and recruiting future-doctors. If considering this healthcare need in the selection process, it is hoped that 'downstream', recruitment targeted students will eventually fill healthcare needs (Silver et al., 2019). In the UK, this is often colloquially referred to as a 'train local, work local' mentality, when the medical school is in close proximity to underserved areas. Further, this utilitarian argument postulates that individuals recruited from certain populations have a better baseline understanding of those groups, and therefore, may be better suited to serve those communities in a medical capacity. This may apply to having shared language or accents (Marrast et al., 2014), cultural understanding (Betancourt et al., 2002), or even outward appearances that initiate and promote good patient-doctor relationships (Alsan et al., 2019).

The utilitarian argument does make assumptions about future practice of specifically recruited students; particularly if this mentality is more part of a hidden curriculum (Hafferty and Gaufberg, 2013). Students may not be aware of the expectations of them to serve in certain capacities after graduation. However, there is a body of evidence that certain 'underrepresentation' indicators have some predictive ability in determining whether an individual eventually serves underserved populations (Rabinowitz et al., 2000; Cantor et al., 1996; O'Connell et al., 2018; Dowell et al., 2015; Griffin et al., 2017). Particularly in considering underserved rural communities; there is a body of literature that indicates selectively admitted individuals from rural backgrounds are more likely to eventually practice rurally (Somers et al., 2007; Brooks et al., 2002; Kondalsamy-Chennakesavan et al., 2015).

But, even in the context of interest in service, this approach also raises moral questions around social mobility; for example, wages in underserved communities and specialties may be lower than other options. If recruiting diverse individuals

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from low SEC backgrounds to fill these positions, there could be the argument medical education is then perpetuating their economic inequities (Moy and Bartman, 1995), and not truly supporting social mobility, or considering the wellbeing of minoritised doctors in these positions (Silver et al., 2019). This may be morally ambiguous, and not promote a sense of a just and equitable medical education system, which leads to the final discourse for WP.

3.3.2.3   WP as Social Justice and Transformative Action

The previous two discourses concern the broader societal benefits of WP, particularly from a more strategic and societal needs perspective. However, if ascribing to more transformative and equitable philosophies, then there exists another discourse: WP is the 'right' thing to do, as a means of social justice.

The transformative approach to higher education posits that the system should be changed, not just to the benefit of the system, but for the benefit of historically underrepresented individuals. It draws on multiple theories of transformative learning and social justice (Sandars and Sarojini Hart, 2015; Giroux, 2010; Frenk et al., 2010), or considering justice as the (re)distribution of wealth, opportunity, and privilege in society. This more democratic view of education considers that what constitutes knowledge and learning should be reconsidered (Kumagai, 2014), and made accessible to all members of society. It resists deficit models, by aiming to elevate the power and knowledge that underrepresented individuals have to offer. It also calls for rethinking what 'excellence' means in medical education (Nicholson and Cleland, 2015; Razack et al., 2020), and how underrepresented individuals are already excellent potential doctors, in their own rights. WP, therefore, is the manifestation of practices that are ultimately designed to support social justice, and result in transformative action and learning in the entire system of education. Indeed, many of the principles of social justice education (Carlisle et al., 2006), such as inclusion, equity, and accessibility, directly align with the definitions of WP and WA, described in Chapter 2 (2.3.1.1).

However, there are concerns with the social justice approach to education. Most notably, transformative learning may not be a 'natural' process associated with

recruiting underrepresented students; without changes to the system, these students may still struggle to achieve their potential. The theory of transformative learning calls for active consideration of personal experiences to provide context and meaning to learning (Wittich et al., 2010). As such, there is support for more holistic considerations of WP, in conjunction with promotion of social justice (Kettley, 2007), to promote this. WP will be limited to recruitment, and this discourse futile, if it fails to also consider curricular and organisational structures.

3.4   Chapter Summary

There is social injustice and inequity in the world, and the system of medical education mirrors this. The sociocultural influences that have determined the focus of inequity, and as such, the focus of WP, were outlined in this chapter. Then, discourses on why addressing such inequity is important (or should not be a priority) were examined.

As briefly outlined in Chapter 2 (see 2.2.2), this doctoral work takes the position that fairness in medical education should consider the profession, patients, and underrepresented individuals. As such, the three discourses of widening participation should be considered together: the academic supports the profession, the utilitarian healthcare the patients, and the social justice and transformative element the underrepresented individuals who are targets of WP. With this 'why' of widening participation established, this work now turns to the 'how': what are the actual mechanisms of WP in the UK, and how effective are they in supporting these various discourses and actually 'widening participation'?

Chapter 4:   The 'How' – Mechanisms to Widen Participation in Medical Education

4.1   Chapter Introduction

The previous two chapters of this thesis established definitions for terms frequently used in the field, as well as the myriad of reasons that support enactment of WP policy and programmes. This chapter now turns to the 'how'; if logic follows that widening participation *should* exist, *how* do medical schools support these ideologies in their actions?

Given the geographical focus of this thesis, much of this chapter will describe initiatives in the UK that support widening participation and access. However, for context, this chapter includes comparison of some mechanisms on the global stage. As such, it begins with a description of the variances in medical education, globally. The structure of medical education systems can influence how and 'when' interventions are put in place, to address issues of underrepresentation in medical student population. This section also details more specifics on UK medical education, including key aspects of applying to medical school.

The chapter then describes and critically appraises types of medical education WP and WA programmes, first with a description of those in the 'outreach' branch of WP. This follows with initiatives that might be better defined as in the 'selection' branch of WA. There is then an in-depth description of Gateway to Medicine programmes, one of the prominent focuses of this thesis. Finally, how WP and WA fit with considerations of retention and progression for students from underrepresented backgrounds is addressed.

4.2   Structure of Medical Education, Globally

First, it is important to understand that medical education is variable around the world. This, in and of itself, can create differences in the mechanisms countries may use in recruiting diverse students to medical courses. This also interacts with the sociocultural influences and needs of a given country, as described in the previous chapter (see 3.2.2).

A thorough review from Wijnen-Meijer et al. (2013) presents clear definitions and descriptions of medical training globally. They identify seven distinct 'routes' or models of medical education. The United Kingdom operates with medicine largely as an undergraduate degree, recruiting students from secondary education, who do not already possess a higher education degree. Medical school graduates must then complete an 'internship' (the Foundation years) prior to entering the 'residency' period, or postgraduate medical training. Australia, Bangladesh, Denmark, Egypt, Israel, Japan, Pakistan, and Sweden operate on similar models.

Argentina, Brazil, China, Colombia, The Democratic Republic of the Congo, Dominican Republic, Ethiopia, France, Georgia, Germany, India, Indonesia, Iran, Italy, Mexico, Netherlands, Nicaragua, Nigeria, Peru, Russian, Saudi Arabia, South Africa, South Sudan, Sudan, and Turkey have similar structures of undergraduate medical school, though with subtle differences in post-medical school training requirements and steps.

These routes differ from other countries, particularly in North America. In Canada and the United States of America (USA), medical school is offered only as a postgraduate degree. Medical students must have a baccalaureate or university degree, after their secondary school education, in order to matriculate to medical school. Students also then proceed directly to residency programs after medical school, with no form of foundation training. Australia and the Philippines also offer similar routes of graduate medical education, but with the internship preserved.

It is also worth noting that in recent years, this North American model of graduate medical education has spread; in the last two decades, the UK expanded its number of medical schools and types of medical courses. There now exists specialized graduate entry medicine courses in the UK (Garrud and McManus, 2018), for those who possess a Bachelor's degree already; these are similar in duration (four years) to the programs offered in Australia, Canada, the USA, and Philippines, and shorter than the typical five to six years for undergraduate medical courses. There is evidence that these graduate entry programs in the UK are more likely to have ethnically diverse cohorts, representing a wider range of socioeconomic backgrounds

than the undergraduate, or 'standard entry' (occasionally referred to in the literature as SE) programmes (Garrud and McManus, 2018). While this thesis is not focussed on graduate education in the UK, it is worth noting these programmes may be another field of exploration for WP. The key demographic that is the underrepresented in most 'standard entry' medical courses around the UK- those from working class, lower socioeconomic backgrounds, are less underrepresented in graduate entry medicine.

4.2.1   Details on Structure of UK Medical Education

As this doctoral work was conducted in and focuses largely on UK medical education, it is important to note here some additional details about the structure of this system. This is particularly important in understanding the scope of outreach and selection, as means of WP.

4.2.2   Types of Programmes of Study

As noted above, UK medical education is largely an undergraduate degree. Most students matriculate directly from secondary school, and are often referred to as 'school leavers.' Students who do not matriculate directly or matriculate after gaining another degree or other work experiences are often referred to as 'mature students.' Mature students may be particularly interested in the newer graduate entry routes to medical education in the UK, especially if they possess a relevant undergraduate degree (Garrud and McManus, 2018). However, there two other additional routes for entry to UK medical education, other than the graduate and standard entry programmes already mentioned. Figure 1, on the next page, describes the four means of entry to medicine in the UK. Of these entry routes, 'Medicine with a Gateway Year', or Gateway to Medicine years, will be of particular focus for this thesis. These courses are described in detail later in this chapter (see 4.5.1), but it is worth noting they may be referred to as Gateway years/courses/programmes interchangeably throughout this doctoral work.

Figure 1: UK Medical Education Entry Routes

Standard Entry
- Duration: 5 years of undergraduate medical training (few programmes are 6 years)
- Designed for: students who obtain correct type of competitive A-levels, Scottish Highers, or other access courses
- Qualification: A Bachelor's degree in Medicine, Surgery

Graduate Entry
- Duration: 4 years of undergraduate medical training
- Designed for: Students who already hold a Bachelor's degree
- Qualification: A Bachelor's degree in Medicine, Surgery

Medicine with a Preliminary Year (formerly Foundation Year)
- Duration: 1 preliminary at start, followed by a Standard Entry programme (5 years)
- Designed for: students who obtain competitive A levels (but not in required science subjects)
- Qualification: A Bachelor's degree in Medicine, Surgery; Occasionally additional certificate for preliminary year

Medicine with a Gateway Year
- Duration: 1 preliminary at start, followed by a Standard Entry programme (5 years)
- Designed for: students who "are high ability but who may have had barriers to their learning due to circumstances"; use adjusted criteria for entry, accept non-competitive A levels
- Qualification: A Bachelor's degree in Medicine, Surgery

Figure 1: Details about the four entry routes to medical education in the UK, including duration, targeted student demographic, and resulting qualification. Note, the 'Duration' of Gateway years is further detailed below, in the Gateway specific section.

4.2.3   Applying to UK Medical Education

4.2.3.1   Academic Achievement

High educational attainment, or achievement, in the sciences is often a key factor in obtaining admission to medical school (Pearce, 2008). In the UK, this means demonstrating success in 'A-Levels' (General Certificate of Education Advanced-level grades) or 'Scottish Highers' (Powis et al., 2007). Most students will select three or four A-Levels 'subjects' to study for two years, from ages 16-18, in a secondary school, or sixth form college. Examinations at the end of this period result in grades that are designed to demonstrate academic achievement, and can be used in the selection process for university. In the Scottish system, most candidates typically select five Higher subjects to study, followed by an additional two or three 'Advanced Highers', that are roughly the equivalent of A-Levels (Tiffin et al., 2016).

For medicine, specific subjects for A-Levels and Scottish Highers are typically required by medical schools (Biology, Chemistry, for example) and are very competitive (McManus et al., 2008), although they have reasonable predictive

validity for medical school outcomes (McManus et al., 2013a). Still there have been calls to contextualise these grades more, particularly in the context of secondary school influence (Mwandigha et al., 2018). This will be revisited in the selection portion of this chapter (4.4.1). However, there may be other 'acceptable' standards of academic achievement considered for other means of medical school entry, as described in Figure 1, on the previous page. These entry routes are opportunities for those who do not obtain competitive A-Levels grades, or have A-Levels taken in subjects not accepted to medicine. Selecting the 'correct' A-Levels, particularly in the sciences, is a path that needs to be determined even earlier in secondary education, by taking the correct subjects and performing well enough in the General Certificate of Secondary Education (GSCE), taken prior to A-Levels.

4.2.3.2 Aptitude Tests

Another key element in many UK medical education application requirements is the UCAT (University Clinical Aptitude Test, formerly the UKCAT, UK Clinical Aptitude Test). This exam was first introduced in 2006, but now the majority (30 out of 38) of UK medical schools use in their selection processes (Greatrix and Dowell, 2020). It was introduced in an effort to add another measure for considering the 'best' future doctors, but also as a means of WA (Tiffin et al., 2016). In 2019, the test underwent the aforementioned name change from UKCAT to UCAT, to be more inclusive, with its adoption by medical and dental schools in Australia and New Zealand (UCAT Consortium, 2019).

The UCAT is a two-hour, computer-based test, notably shorter than its North American counterpart, the Medical College Admission Test (MCAT), that lasts nearly eight hours. The UCAT consists of subtests for a range of 'cognitive' measures including: verbal reasoning, decision making, quantitative reasoning, and abstract reasoning. These cognitive subtests are individually scored, resulting in an overall score (Greatrix and Dowell, 2020). In 2013, the UCAT also made the addition of a situational judgement test (SJT) that scores applicants in one of four 'bands' meant to reflect non-academic attributes that may be important in medical practice. Despite it being widely used as a selection measure, medical schools vary widely in how they use the UCAT, for example to select for interview, as a weighted

component of an application, or as a threshold measure (Greatrix and Dowell, 2020; Adam et al., 2011). This also applies to medical school use of the UCAT specifically in the context of WA; the success of the UCAT, as the primary medical admissions test in the UK, will be further addressed later in this chapter (4.4.2).

It is also worth noting that there are other admissions test used by some UK medical schools, particularly the BioMedical Admissions Test (BMAT), and the Graduate Medical School Admissions Test (GAMSAT). As the name denotes, the GAMSAT is a test used for graduate-entry programmes not just in the UK, but also Australia and Ireland. The GAMSAT also is not specifically designed for medical school entry, rather is a selection tool for a variety of students, to assess potential ability to pursue graduate studies (Coates, 2008). The BMAT, while introduced in 2003 prior to the UCAT, presently forms part of the selection process in a minority of medical schools. It includes elements on critical thinking, scientific knowledge, and writing skills; it has been suggested that the schools that elect to use the BMAT prefer the inclusion of the scientific knowledge element for selecting applicants (Emery et al., 2011).

4.2.3.3   Personal Experiences and Background

Finally, application to medical school in the UK often requires statements about relevant work experience, and a personal statement. These are additional means to demonstrate interest and commitment to studying medicine, and can be key in making an application 'stand out' in a competitive academic system. Examples of work experience should relate to working with people in a caring or service role, or the direct observation of healthcare, often referred to as 'shadowing' experiences. How personal experiences and background are used in the admissions processes for medical school is quite variable (Patterson et al., 2016). And indeed, in recent years, many medical schools have modified their admission requirements to state that work experience may include many types of work, be 'desirable' rather than required, or, for the majority of schools, been removed entirely as a requirement (Medical Schools Council, 2020a). This will be further explored later in this chapter (4.4.3), including consideration for the methods of contextual admissions (see section 4.4.4), that make greater contemplation for applicant background.

4.2.3.4 Application Submission and Interview Processes

As for the actual application itself, the Universities and Colleges Admissions Service (UCAS) is the national system that coordinates applications for UK universities (BeMo Academic Consulting, 2021; Medical Schools Council, 2018f). Applicants can select a total of four medical programmes/schools to apply to; for other higher education programmes, five options are allowed. Medical school applicants can opt to leave their fifth option blank, or apply to a different degree from medicine. Most medical schools independently review applications they receive via UCAS, using their own systems of evaluation. They will then extend offers to interview, that tend to be in one of two formats: a 'traditional'/panel interview, or the Multiple Mini Interview (MMI). Traditional or panel interviews ask questions relating to the applicant, their experiences, and suitability for a career in medicine. MMIs, a 'newer' interview format, have applicants go through timed stations of interviews, with prompts at each. While some stations may include similar prompts to a standard interview, MMIs also feature scenarios where applicants are challenged to think more critically (Eva et al., 2004). Some MMIs also include role-playing or teamwork stations, to assess applicants in other non-cognitive measures that may be of interest, such as empathy and communication skills. MMIs, and the station organisation, offer the opportunity to create interviews that are more standardised and structured, thus contributing to greater reliability and reduction of interviewer bias (Knorr and Hissbach, 2014). This notion that MMIs might be a more reliable means of appraising applicants, particularly for those from WP-backgrounds, will be discussed later in this chapter (4.4.5).

4.2.4 Variance in UK Medical School Structure, Function, and Culture

It might go without saying, but not all medical schools operate in the same way. Across the UK, medical schools will differ on standards for admissions and selection, curriculum design, and even ultimate degree or qualification granted. It is also important to note that the number of places to study at medical school in the UK is regulated by the government at a national level, despite high local variance in operation; the Department of Health determines the number of places available within any given medical school (Rimmer, 2020), often referred to as a 'cap'.

The variance in culture of medical schools is also an important construct to consider. Given the varied history and tradition of medicine in the UK (Boursicot and Roberts, 2009), there are medical schools that have been in existence for hundreds of years, versus 'newer' generations of schools established in just this century. History and culture of medical schools can be particularly important in considering WP and WA. For example, the newer generations of medical schools may view the context of their creation to be, in part, aligned with more of a utilitarian healthcare argument, described in the previous chapter (3.3.2.2). Created in specific, underserved regions, these schools might have cultures focused on workforce management (Howe et al., 2004). Alternatively, more 'historic' institutions might still be aligned with the ideas of medicine as a meritocracy, linked to histories of 'excellence' (Cleland et al., 2015). The notion of school culture and its importance in WP policy and practice in medical education will be revisited throughout this doctoral work, as this can play an important role in determining what types of WP mechanisms schools may opt to enact, particularly in considering outreach and selection.

4.3   Outreach Mechanisms and Widening Participation

As defined in Chapter 2 (see 2.3.1.2), 'outreach' in terms of WP relates to any service or programme coordinated by a medical school designed to reach 'into' communities to promote application and matriculation for students from low SEC backgrounds. Outreach can be coordinated in large scales, such as the internationally recognised 'Teddy Bear Hospital' programmes (Rob, 2020), or on more regional and local levels, by individuals schools and groups. In the UK, there is national guidance for outreach available for medical schools, produced by the Medical Schools Council (Medical Schools Council, 2014a).

The view of some is that outreach is perhaps *the* key element of WP (McLachlan, 2005), yet reports indicate that outreach is often 'patchy', with 'cold' spot regions around the UK where schools receive no outreach (Garrud and Owen, 2018; White, 2016). While medical schools enact more programmes to address this, the heterogenous nature of outreach types can complicate communication about what outreach is, and who it is designed to help. Here, WP outreach for medical education is categorised and appraised in four domains: primary education outreach (and 'pre-

16 programmes), secondary education outreach (and 'post-16' programmes), work experience or mentoring schemes, and teacher or advisor guidance.

4.3.1   Primary Education Outreach (and 'Pre-16' Programmes)

'Pre-16' outreach programmes are designed to target individuals under the age of 16, and include primary education programmes, targeting younger children.

Outreach activities are variable, but can include 'fun' activities related to medicine, or provide context about a medical career. These types of programmes vary in length, but often operate as 'single day' outreach events, lasting only a matter of hours (Azmy and Nimmons, 2017). These may involve medical schools going into communities, but also include another form of pre-16 outreach, 'taster days' or 'open days', though these do not always have a WP-focus. Taster Days are opportunities where students and parents can come to university to have a 'taste' of what a particular route of study is like. However, these types of days may not effectively reach a broad scope of students, given the element of self-selection to attend. Additionally, these types of days might not be considered the 'best' use of academic time (Martin et al., 2018), or particularly effective in actually encouraging applications and matriculation (Moore et al., 2013).

There are also examples of more longitudinal pre-16 outreach. Pearce and Gargett (2005) describe a seven-week, thirteen lesson long programme where students gained clinically- and scientifically-oriented experiences, linked to a school's curriculum. This programme was piloted specifically with pre-16 students identified at 'at-risk' for losing interest in sciences, due to low grades; as such, in the UK system, they would not select A-Levels in sciences, limiting their higher education options in this field. These more rigorous forms of early educational outreach might be particularly useful in the UK medical education system, supporting students before they are forced or funnelled out of the field via GCSEs and A-Levels decisions, even at young ages.

'Earlier' educational outreach interventions are also believed to be successful in tackling pre-conceived narratives around education for those from low SEC backgrounds, with little familiarity of university (Greenhalgh et al., 2004; Mathers

and Parry, 2009; Gore et al., 2018; Ferguson et al., 2012). This links to the notion of 'raising aspirations' in medical education WP; the idea behind this being that via earlier exposure to medically relevant learning experiences, more students from WP-backgrounds will *aspire* or want to become doctors (McHarg et al., 2007). However, this view of 'raising aspirations' may be considered outdated; recent work suggests that students may already possess 'aspirations' and even confidence in the diverse perspectives they offer (Alexander et al., 2019). There have been calls in the field to rethink 'aspirations' beyond "hopes and dreams" to integrate more practical elements into early outreach, that focuses on how to help students navigate barriers to pursuing medical education, including financial barriers and lack of strategic knowledge about the system (Southgate et al., 2015; Robb et al., 2007).

Still, there remains the challenge of measuring 'success' and 'impact' of outreach in this early education outreach field, which may explain the limited appraisal literature for primary education outreach programmes. Given the huge variety of sociocultural variables that occur during child and adolescent development, it may be hard to determine the value of any given activity or content in a student's educational trajectory to medical education. However, it could be that the value of such outreach is more generally in increasing participation and access to higher education, and early educational enrichment via outreach may support this. More targeted, and thus measurable, initiatives typically relate to secondary education outreach.

4.3.2   Secondary Education Outreach (and 'Post-16' Programmes)

As students age, WP outreach can be more targeted, with A-Levels or Scottish Highers selected, and university on the viewable horizon. Particularly in the UK, 'post-16' and late secondary education programmes tend to be structured more similarly to medical education. This is so that students who will soon be applying to university (given the UK undergraduate medical education system), will have better understanding of what medical education entails, and can get specific details on the process of applying to medical education. Specific application guidance and mentoring programmes will be re-visited in the next sections (4.3.3, 4.3.4); here, the focus in on broader WP outreach, although these may include application guidance and/or mentoring as an element.

While some types of post-16 outreach may be shorter, single events (Hamdan and Lea, 2012) similar to the primary education outreach field, most types of secondary education outreach are more intensive. One popular format in the UK are week long 'summer schools' over school holidays, hosted on medical school sites. Smith et al. (2013) describe one such programme in London, where students get structured clinical and basic sciences experiences, with application guidance from medical students and staff. Indeed, this structure is common, with programme designs for summer schools often emphasising small-group work, professionalism tasks, and clinical or real patient integration (Dunkley et al., 2006; Ta, 2019). It is posited that these summer school experiences can provide insight to higher and medical education, while fostering respect and confidence, role-modelling by medical students, and demonstrating dedication and support from medical school leadership and staff (Greenhalgh et al., 2006). It is also worth noting, that some of these 'summer school' experiences are actually funded by national groups, such as the Medical Schools Council (MSC) and The Sutton Trust (Medical Schools Council, 2018d; The Sutton Trust, 2021). While still operating in individual medical schools, these opportunities demonstrate national commitment to this form of outreach. And some research indicates that these nationally-funded summer schools have led to greater rates of application for WP-background individuals (Hoare and Mann, 2011).

Another well-recognised format of post-16 outreach that is also nationally funded is the Pathways to Medicine programme, supported again by The Sutton Trust (The Sutton Trust, 2021). These programmes operate in four regions in the UK: Hull-York, London, Newcastle, and Nottingham. They are two-year programmes for individuals from WP-backgrounds, where they have the opportunity to have longitudinal support from a medical school prior to application, including networking, mentorship, summer schools, and specialised resource access.

Yet, despite the posited 'success' of these types of post-16 programmes in encouraging and supporting *application* to medicine (Medical Schools Council and NHS Health Education England, 2021; Medical Schools Council, 2020b), the 'problem' persists. There is still documented lack of inclusion for WP-background students in medical education (Medical Schools Council, 2019b). And while initial reporting from

the MSC indicates that their summer school programme promotes 'participation' from WP-background students, modestly increasing applicant confidence (Medical Schools Council and NHS Health Education England, 2021), there is otherwise a paucity of research related to these types of post-16 programmes. As such, it is difficult to appraise the disconnect between programme expansion and stagnant recruitment numbers.

However, one explanation may be the relatively low numbers for these more resource-intensive and selective means of outreach. The MSC Summer School was open for only 350 students for 2019-2020 (Medical Schools Council and NHS Health Education England, 2021), a proportionally small number of potential medical school applicants; and data are not yet available for the 'outcomes' of these students in terms of success in matriculating to medical school. Furthermore, it should be noted that students must apply to do these forms of outreach as well, and this may result in creation of another 'barrier' to participation, thus not improving representation numbers in the grand scheme of underrepresentation. Finally, if not targeted well enough, more outreach might lead to generally more applications to medicine, which may ultimately decrease chances of acceptance for WP-background individuals, as it creates a more competitive, wider pool of applications. However, these more rigorous programmes are not the only way that post-16 students can access outreach and support to apply to medicine.

4.3.3   Work Experience & Mentoring Schemes

Structured work experience (WEX) is not only an important feature of medical school application, but can also help solidify student interest in working in the health professions system, or NHS (National Health Service) in the UK (Pearce, 2004). As noted above (4.2.3.3), 'work experience' can be defined as a variety of activities, but typically must include working in a caring/service capacity, or observing in a healthcare setting. Commitment to service is a key ideal in medical education, and particularly in the field of WP, if ascribing to utilitarian healthcare beliefs. However, in a report for the MSC, Nicholls et al. (2017) highlight that while the importance of WEX is appreciated, it can often be challenging for WP-background individuals to find suitable opportunities. The report from Nicholls and colleagues also indicates

there are clear differences in opportunities for those from independent schools, compared to those in state schools. This has also been evidenced in other work, suggesting that private schools in higher SEC areas have better 'connections', which can result in more of their students achieving professional WEX, including in the medical field (Hatcher and Le Gallais, 2008; Mann and Kashefpakdel, 2014). This creates another advantage in applying to medicine for applicants from elite backgrounds. As such, this report makes recommendations for better work experience guidelines, placement provisions for underrepresented students, and toolkits to assist in the process of obtaining such experience.

Mentoring schemes may also be a key source of support in applying to medical school (Nimmons et al., 2019). Lack of information about application processes can be a barrier to medical school application for WP-background students, particularly 'older' or post-16 students (Martin et al., 2018); mentoring can be a way to mediate this. Kamali et al. (2005) describe their programme where undergraduate medical and dental students provide assistance and/or advice on the UCAS application process. Their findings suggest that this programme was associated with a rising trend in offer rates for supported students from low SEC backgrounds, and supports the workability of near-peer programmes, which may lessen burden on medical schools and national bodies.

Further, some have used mentoring to expand the scope of work experience, and address some of the issues noted above. Davies et al. (2021) describe a program where potential WP-background applicants shadow a medical student, both on wards and in class, to gain a better scope of experience. Having this contact and experiential expert can be a helpful way to guide students through the process of applying. While intensive in coordination, so secondary students are permitted access to clinical and educational spaces, this type of programme has potential to aide in WP applications to medicine. And while mentoring need not be such a formal activity as this, particularly when supporting WP-background students, having established schemes associated with medical schools can help students establish mentorship. Even near-peer, or virtual mentoring schemes, have been shown to be useful to students from WP backgrounds; this might be attributed to having an

insider perspective to university and medicine, that other students who are not first-in-family may already have (Harris and Lane, 2020; Nicholson and Cleland, 2017).

But again, the issue around work experience and mentoring targeted at WP groups lies in evaluation. While there are some promising examples noted above, the actual impact of such programmes is not well understood. Typically, organisers rely on basic scales and ratings on satisfaction from participants (Ratneswaran et al., 2015), or simple tracking about rates of application and acceptance to medical school (Smith et al., 2013). While this is a good start for evidence-base to support these mentorship programmes, more rigorous models of research are warranted. Specifically for work experience and mentoring schemes, these forms of outreach may have unique benefits in the longitudinal and personal elements, but also may require more time commitments from facilitators and participants, creating potential barriers. As such, their efficacy, compared to the previous forms of outreach, needs to be better understood.

4.3.4   Teacher and Career Advisor Guidance – Indirect Outreach

The final form of WP-related outreach considered in this thesis is more of an 'indirect' form. That is because it does not aim to directly target and work with students, like the three aforementioned outreach categories. Rather, it aims to support the individuals that do the supporting of students in their educational journey (to medical education): teacher and career advisors.

The influence and actions of teachers and career advisors can be huge in swaying, or deterring, students in applying to higher education. This can happen via both promoting academic aspirations to certain educational paths, like medicine, or by framing student academic achievement as in (mis)alignment with applying to higher education (Fleming and Grace, 2014). In these capacities, some regard teachers and advisors as 'gatekeepers' to higher education (HE), particularly for students from state schools, who may be less familiar with HE (Oliver and Kettley, 2010). Indeed, Mathers and Parry (2009) found in their study with state-school educated medical students that school staff were often unprepared or actively discouraging when students approached with interest in medicine as a career path. Similar findings,

highlighting school staff as a barrier and negative force in considering medical education, have been shown in other studies (Southgate et al., 2017; Southgate et al., 2015; McHarg et al., 2007; Alexander et al., 2021; Wright, 2015). This evidence suggests that medical school outreach should do more to not just target students in non-selective schools, but also to target teachers, so they can better communicate the notion that a wide variety of individuals make great doctors, regardless of background. It may be school staff that require the 'raising of aspirations' via outreach, not students.

In order to achieve this, teacher training and partnerships with medical schools as potentially high yielding form of outreach in this category, has been suggested as one model to consider (Alexander et al., 2021). There is also some evidence of commitment to this type of outreach on a national level. The MSC has an extensive page on their website comprised of 'infosheets' and videos ('infoshorts'), specifically for teachers *and* students, that launched within the last few years (Medical Schools Council, 2017b). Additionally, they have started hosting admissions webinars to support teachers and career advisors in target WP schools and colleges (Medical Schools Council, 2020c). However, it is worth noting that all these resources require elements of self-selection, self-education, and baseline support and motivation from teachers and advisors. Further, there are no published data on the utilisation rates for many of these resources, although it was noted that there were 500 participants in the most recent admissions webinar (Medical Schools Council, 2020c). While this statistic is encouraging, further research is warranted to understand the engagement of educators with these types of resources, and their efficacy in medical education WP.

4.3.5   WP Outreach: In Summary

The above sections describe several forms of outreach in medical education WP, from pre-16 programmes to those that indirectly support students by supporting school teachers and advisors. While there are those that believe there is not enough commitment to WP outreach by medical schools (Apampa et al., 2019), this review of the literature shows that there are numerous activities that exist. Further, in the last five years or so, there has been an increased diversity in the *types* of outreach

programmes (Medical Schools Council, 2017b), particularly those coordinated on the national level (Medical Schools Council, 2020c).

And yet, even with modest expansion in practice, there exists a lack of research and clear evidence-base for the 'success' of these types of outreach. While there are some more rigorous studies, that employ theory to deepen understanding of the function of WP outreach (Alexander et al., 2021), for the most part, knowledge in this particular aspect of WP is limited to basic evaluations and simple empirical evidence (Greenhalgh et al., 2006; Greenhalgh et al., 2004). While initial findings are promising, this lack of theoretical, rigorous research is a clear gap in the field.

4.4   Selection Mechanisms and Widening Participation

Selection, and the best means to select medical students, is a broad field in medical education (Cleland et al., 2014). This doctoral work is specifically focused on selection research that considers 'fairness' and widening access. Here, selection and its role in WP will be considered from four perspectives, mirroring the key aspects of medical school application, as outlined earlier in this chapter (4.2.3): academic achievement, aptitude tests, personal experiences and background, and interview processes. It is also worth noting that while 'WP' continues to be the utilised term here throughout, 'WA' when discussing alterations to selection may be more appropriate; the distinction between these two terms was outlined in Chapter 2 (2.3.1.1).

4.4.1   Academic Achievement and Widening Access

As noted numerous times already in this work, there are large discrepancies in applicant and student schooling (state-funded versus independent) representation in UK medical schools and HE (Milburn, 2012). WP-background individuals are more likely to attend state-funded schools, which may impact the quality of education and application support they receive, resulting in structural barriers to applying to medicine (De Freitas et al., 2021).

Yet, prior academic achievement continues to be a major component in UK medical school applications, sometimes referred to as the 'Academic Backbone' of selection (McManus et al., 2013c). Perhaps this is attributed to the large amount of evidence

that supports the predictive validity of academic achievement for medical school performance (McManus et al., 2013b; McManus et al., 2003; Ferguson et al., 2002). However, in considering the UK system of educational achievement with A-Levels in particular, some work suggests that the grading system might not be best-suited for the highly competitive selection of medical education (McManus et al., 2013a), limiting discriminatory power of this measure.

Furthermore, in considering academic achievement with the aforementioned influence of secondary schooling, Mwandigha et al. (2018) demonstrated that the predictive validity of grades was substantially dependent on the nature of the secondary school attended, and thus, not necessarily reflective of applicant potential. This aligns with the notion of the myth of meritocracy, noted in the previous chapter (3.3.1); grades may be more representative of the 'quality' or performance of a school, not an individual. Further, there is evidence that students from state-funded schools actually out-perform peers with similar grades from more selective schools, once in medical school (McManus et al., 2013a), and particularly in the later years of medical education (Kumwenda et al., 2017). This evidence supports the argument that while grades may be a barrier to entry for WP-background students, even when they are not, they are not perhaps the best indication of potential of applicants to thrive in medical education and serve the profession. This bolsters the case that academic achievement should be contextually considered, to promote WP (Kumwenda et al., 2017). One suggestion for doing this is the use of 'grade discounts' for those who can demonstrate they are eligible (Mwandigha et al., 2018), via their secondary school's performance and rankings.

It is also worth noting here the role of academic achievement in the current educational climate, due to the coronavirus (COVID-19) pandemic (Rimmer, 2020). The use of 'predicted' and 'forecasted' A-Levels, in lieu of standard A-Levels, due to disruption of normal examinations, may reduce the predictive validity of this selection measure more so (McManus et al., 2020). The fall-out from these changes may perpetuate and worsen the achievement disparities for individuals from WP-backgrounds (Smith and Cleland, 2020). However, this may present a unique

opportunity and moment in time to revisit medical school's perceptions and use of academic achievement in selection, to support WA.

4.4.2   Aptitude Tests and Widening Access

As described above (4.2.3.2), the use of the UCAT, in particular, in medical school applications is now fairly standard practice for the majority of schools in the UK. And there is evidence of some (modest) incremental predictive validity for medical school performance from the UCAT over and above A-Levels achievement (Tiffin et al., 2016), particularly for the 'cognitive' sections of the UCAT (Finn et al., 2018). While an SJT element was introduced and is posited to be a potentially useful aspect for applicant selection (Patterson et al., 2016; Greatrix and Dowell, 2020), there is a lack of evidence at this point to support this element as predictive for academic achievement in medical school. However, recent evidence suggests that medical schools may be more flexible in their requirement and use of the various components of UCAT for applicants flagged as from a WP-background (Greatrix and Dowell, 2020), which implies that generally, this measure is being used in a thoughtful way to try and promote WA.

However, the relationship between WP-background and UCAT score should not be ignored, regardless of potential flexibility in use. While in theory, the introduction of the UCAT offers a standardised alternative or additional data point to academic achievement, differences associated in disadvantage have still been observed with this exam. James et al. (2010) and Tiffin et al. (2014) demonstrated in different studies that candidates from independent schools tend to achieve higher scores on the UKCAT, just as with A-Levels. Individuals from lower socioeconomic and non-professional backgrounds performed at a lower rate in both these measures. And while Tiffin and colleagues did conclude that the school-type bias might be more pronounced for A-Levels than the UKCAT, the results of this work, and how they reflect on the UCAT, are still concerning from a WP perspective. These findings suggest that even 'standardised' and aptitude-based measures for selection may continue to disadvantage WP-background individuals, again supporting an argument for more contextual information not just for grades, but also standardised exam

scores. Still, the UCAT might be considered a bit overall 'fairer' to applicants (Tiffin et al., 2012; Tiffin et al., 2014).

It is worth noting that there is other longitudinal research that counters this perspective, suggesting that the UCAT does not correlate with reduced disadvantage for WP-background applicants (Mathers et al., 2016). However, this work from Mathers and colleagues only analysed the use of the UCAT in three ways: borderline, factor, and threshold. This means the UCAT in this examination was only used in: borderline cases to make interview offers, as a weighted factor amongst other selection criteria, or as a screening threshold for application review. None of these measures were noted to directly relate to consideration for students specifically flagged as from a WP-background. As noted above, Greatrix and Dowell (2020) outline how the use of the UCAT can be far more variable when *specifically* used as a WA tool. Examining adjustments or use of the UCAT, in conjunction with other application materials provided by WP applicants, may result in this being identified as a more inclusive selection tool, countering the points made by Mathers et al. (2016).

Finally, there is some consideration for the other element of the UCAT, the SJT, and other aptitude tests, as they relate to personal characteristics that may be particularly helpful in a medical education setting, such as empathy or situational interpersonal judgement (MacKenzie et al., 2017). These might be more useful, particularly in demonstrating other skills or abilities WP-background individuals may possess, outside of those contingent on academics, and for generally improving standardisation of selection on the basis of 'aptitude' (Turner and Nicholson, 2011). However, evidence suggests that the use of many 'non-cognitive' tests relating more to personality are not good predictors of medical school academic performance (Finn et al., 2018). But, this is where notions of 'standards' and 'excellence' are again raised; the underlying goals of these non-cognitive elements, such as SJTs, is more to assess interpersonal constructs that align with medicine, not the academic ability of an applicant (Webster et al., 2020). As such, more work is recommended, comparing aptitude measures like the SJT to more clinically-oriented performance outcomes, or

even patient perceptions, to see if these types of assessments hold value in these aspects of practice.

Still, even with limited evidence at present, there are those that posit the integration of personal quality elements could make selection 'fairer' in considering the needs of the profession (Lumsden et al., 2005). However, this is a complex issue, as methods that could widen participation and opportunities for some groups (such as low SEC), and could also perpetuate disadvantage for others (such as minority ethnicities) (Lievens et al., 2016); different dimensions of diversity need to be considered (Juster et al., 2019). The 'personal qualities' that make an individual well-suited for a career in medicine may vary hugely, depending on who you ask. As such, this area of research also warrants more consideration. Additionally, it should be considered whether the addition of more tests or sections of the UCAT will ultimately equate to more time, and more barriers, for WP-background individuals. Present work should focus on fixing the 'hurdles' that exist in the system of applying already, before adding more.

4.4.3   Weighing Personal Experiences and Background in Widening Access

Both of the previous WP considerations for academic achievement and aptitude test performance highlight the fallibility of these measures, and make arguments for considering more contextual information about applicants. Historically, personal statements have been a key way for applicants to demonstrate personal experiences, and discuss background, for this to be considered (Patterson et al., 2016).

However, there is limited evidence on the validity of personal statements in medical school selection (Ferguson et al., 2000; Ferguson et al., 2003). Furthermore, personal statements can be a point of contention for applicants, in balancing 'honest' expression with what is perceived to be the 'expected' response admissions reviewers may be looking for (White et al., 2011). As such, it easy to see how this 'hidden curriculum' of personal statements (White et al., 2012; Kumwenda et al., 2013) may be even more challenging to navigate for WP-background students. With little or no guidance on application, and limited exposure to higher education,

completing a personal statement to the 'standard' of medical education may be challenging, and even stressful for these applicants. Creating more inclusive standards for elements like personal statements might be a useful solution (De Freitas et al., 2021), but this might not challenge the notions of hidden curriculum enough. And still, it may not be as simple as employing system-wide recommendations for personal statement prompts, as how individual schools may use personal statements in their decision-making process is also highly variable (Parry et al., 2006).

Another approach to considering the 'background' of applicant is using personal characteristics, or demographics, in more a data-collection approach and measure of selection. Much of these data are already collected via the UCAS and medical school enrolment processes, where provided; this is how the MSC and research groups are able to describe the representation of WP-background individuals in medical education (Medical Schools Council, 2019b). The practice of considering particular WP-related criteria, in exchange for reduced selection thresholds for interviews and/or admissions, is referred to as 'contextual admissions' (Rees and Woolf, 2020), which will be further explored here.

4.4.4   Contextual Admissions

In considering selection practices as a barrier to WP, then the argument can be made that students should not need to change, rather admissions policies should endeavour to become more flexible, accessible, and inclusive (Powis et al., 2007). This aligns with evidence in support of contextual admissions, calling for change to selection systems to support WP, rather than requiring students to try and reach a 'bar' that is continuously placed higher and higher out of reach. Powis et al. (2007) considers that admissions teams should consider the academic barriers WP-background individuals face, but also other dimensions that might be considered the 'ideal qualities' applicants should possess, given social missions of medical schools. This 'holistic' consideration of an applicant is often referred to as the practice of contextual admissions.

In the above sections (4.4.1, 4.4.2), the predictive limitations of academic achievement and aptitude test scores were outlined, particularly in the context of student school-type. This evidence also makes the case for promoting more contextual admissions in UK medical schools. However, it is worth noting that contextual admissions is just a theoretical solution to WP; in practice, these type of admissions choices may be challenging to implement, or not yield expected results in widening access. Fielding et al. (2018) found in their study examining changes to selection in UK medical schools, that alterations had little effect on diversifying medical school entrants. But, admission process changes in this study pertained only to the application weight for academic achievement and UKCAT scores in the admissions process. As such, one conclusion the authors make is that these selection changes were not particularly 'radical', and as such, did not result in any meaningful change in the name of WP and WA. The authors call for consideration of more radical approaches to contextual admissions in UK medical education, such as more weight being placed on the personal values and attributes of applicants, or their background. This may include changes like grade and exam discounts for WP-background individuals.

'Radicalising' admissions, however, does require deep consideration for balance, and how to challenge the cultural positions that already exist in medical education and wider society. Examples of these challenges have been documented on the international stage. O'Neill et al. (2013) describe medical education in Denmark, where there was creation of two systems for entry: grade-based and attribute-based. It was hoped that creating the latter option would promote greater social diversity in applicants, particularly those in academic disadvantage due to background. However, this study demonstrated that this admissions system was not successful in this regard; entry option as a form of contextually-driven admissions in this selection capacity did not increase social diversity. In Denmark, a 'radical approach' in admissions was not enough to counteract societal issues.

And in the USA, with its controversial 'affirmative action', there is the perfect cautionary tale for the fine balance, and strong evidence, needed to support and promote 'radical' contextual admissions from this societal perspective. There have

been many political and legal ramifications from this more progressive form of policy. Affirmative action, in medical education, is the practice of favouring individuals from discriminated groups in the selection process by either: having reserved spots for underrepresented candidates, or considering underrepresentation in the holistic review of applications. In the USA, this has been particularly important in considering race and ethnicity of applicants, linked to the social history of the country, discussed in Chapter 3 (3.2.2). The constitutionality and legality of affirmative action as a practice has been weighed numerous times in the highest office of the USA's judicial system, the Supreme Court, including a seminal case from a medical school outcome (Curfman and Drazen, 2013). Supreme Court rulings in the USA have allowed for the holistic consideration aspect of affirmative action, but led to the prohibition of the quota or reserved spot system. As such, some medical schools in the USA are permitted, and continue to utilise affirmative action in medical student selection (Thomas and Dockter, 2019). However, some states still have bans on all forms of affirmative action for race and ethnicity; due to this decision, some schools have adopted 'holistic review' that considers socioeconomic status and secondary school location as proxies for race and ethnicity goals. But unfortunately, these forms of consideration have not been shown to be as effective in increasing racial or ethnic minority student enrolment or other aspects of social diversity (Thomas and Dockter, 2019; Santos et al., 2010). Still, this is less of a focus or current concern for WP in the UK.

These limitations and lessons from affirmative action might be key in considering the expansion of similar policies for UK medical education. This is particularly important in considering the regulations that limit medical school capacity in the UK. Due to the 'cap' on places in medical schools, reserving spots and widening the pool for WP applicants will ultimately result in fewer students from non-WP backgrounds (or non-target groups) being admitted to medicine (Rees and Woolf, 2020). If legal cases from the USA are any indications, this might prove very controversial. However, if considering true commitment to the goals and outcomes of WP and WA, ultimately this is the 'point' – to promote more equal representation and support the social goals of medical education. Present selection techniques are failing at this

(Alexander and Cleland, 2018a; Seyan et al., 2004). Still, shifting this paradigm in UK medical education might be challenging, considering the legacy of culture and 'excellence' in the profession (Alexander et al., 2017).

4.4.5   Interviews and Widening Access

Finally, considerations of WA in selection also concern the interview processes that make up a portion of medical school application process, and can be key in ensuring an acceptance. In recent years, 'traditional' interviews have been shown to lack reliability and validity (Kreiter and Axelson, 2013), particularly with the ability of applicants to be 'coached' on how to respond in the 'correct' or expected manner. This, again, especially limits the potential performance for students from WP-backgrounds (Lambe et al., 2013). The 'newer' MMI format, introduced above (4.2.3.4), has been shown to be a better predictive measure of medical school academic performance than traditional interviews (Jerant et al., 2019), in addition to being considered more valid and reliable. This has led to many schools adopting MMIs as part of their selection processes.

Evidence suggests that MMI performance tends not to be associated with academic achievement or aptitude tests, making it a unique data point that has the potential to test attributes in action (Pau et al., 2013), and perhaps being more demonstrative than polished writing on personal experiences. MMIs, when carefully developed, thus have the potential to be an informative non-cognitive selection tool. However, medical schools should carefully consider ethos and culture of the institution in the of design MMI stations, so that they align with what the school might expect from ideal candidates and subsequent students (Rees et al., 2016). This alludes to a potential issue with MMI structure in terms of WP; if a medical school is not clear on their discourse for promoting diversity, or if there is a disconnect between ideals and actions, then there is no expectation that MMIs will support diversity, despite being a 'fairer' measure (Ellaway et al., 2018). Further, there is evidence that some underrepresented groups can perform significantly lower on MMIs (Rees et al., 2016; Reiter et al., 2012; Raghavan et al., 2013), warranting further investigation on whether MMIs are a good WP tool, or just a generally more valid and reliable form of interviewing, compared to traditional interviews. In terms of UK WP-focus, however,

it is worth noting that some studies support the notion that economic disadvantage is *not* one of the 'underrepresented' dimensions associated with lower scores on MMIs (Reiter et al., 2012; Uijtdehaage et al., 2011; Taylor et al., 2015), suggesting that MMIs may be a good element to consider in WP selection, but perhaps not more general diversity-oriented recruitment. Further research specifically on how MMIs function to promote or hinder WA in the UK system of medical education is reasonable. This should also include understanding perspectives of admissions teams' organisers and facilitators, to understand the intersect of intent and practice for this selection element.

4.4.6 WP and WA Selection, In Summary

In the above section, a focus on the WP considerations for selection highlight the breadth of research in this sub-field. There is a lot of evidence to support specific practices in selection, but also evidence of the unintentional consequences these 'best-practice' methods might perpetuate in considering WP issues. A combination of selection approaches is warranted, with arguments presented for more selection adjustments (such as contextual admissions or holistic reviews) being used, to better consider and weigh WP-background of applicants.

However, there is a notable absence of more 'experiential' evidence in this WP-area of focus. There exists the argument that design and evaluation of selection processes should be a more structured and uniform process (Patterson et al., 2016); however, without considering the perspective of facilitators of these systems of admissions, such an effort might not be widely or easily achieved. The 'human factors' and how they play a role implementing selection systems should be considered as an important aspect of WP research, that is presently lacking.

Finally, while the above is detailed in considering the mechanisms generally employed to support WP and WA in selection, much of the current research in this field has yet to be directly linked to a key focus of this doctoral work: Gateway to Medicine years. Described in detail in the next section of this chapter (4.5.1), these specialised pipelines into UK medical education not only present their own unique selection challenges, but also share many of the elements described in this section.

Contextual admissions and weight of entry criteria may be used differently in these programmes, even though there is still variance and debate over these methods.

4.5   Pipeline Programmes: A Specific Widening Participation Mechanism

'Pipeline programmes' is a term that is frequently used to describe a variety of diversity-oriented activities, particularly in North America. However, this doctoral work makes the distinction between pipeline programmes as longitudinal outreach in secondary or higher education (Murray-García and García, 2002; Muppala and Prakash, 2020; Crews et al., 2020), and pipeline programmes that link outreach with selection to make a direct and continuous 'path' to medical education (Martos et al., 2017).

For example, the 'Pathways to Medicine' programmes described in an earlier section of this chapter (4.3.2) would align with the former, longitudinal outreach. This type of programme has a competitive selection process, offers unique curriculum, formal mentoring, and experiential learning opportunities to students (The Sutton Trust, 2021). However, being accepted to a Pathways programme does not also ensure acceptance, or a guaranteed pipeline or path, to medical education. It *may* significantly increase *potential* selection, although evidence of this is remains to be seen, but acceptance to Pathways to Medicine does not equate with an actual medical school acceptance. This differs from the notion of pipeline programmes as a direct route into medical education. There exist programmes that, upon acceptance and successful completion, do guarantee a spot on a medical course, thereby creating an actual, more 'concrete' *pipeline*, not just a *pathway*. As such, pipeline programmes are considered here in this doctoral work as the intersect of both outreach and selection.

In the USA, there are approximately 50 medical schools that have baccalaureate to medical school pipeline programmes, many of which exist to promote diversity and address healthcare workforce needs (Merritt et al., 2021). But, within the scope of this thesis, there also exists a 'pipeline programme' in the UK, creating a WP-focused link from secondary to medical education: Gateway to Medicine Years (Gateway

Years). These unique programmes are a key focus of this doctoral work, and are critically examined here.

4.5.1 Gateway to Medicine Years

4.5.1.1 What are Gateway Years?

In the UK, Gateway to Medicine years are typically 'small-scale' programmes, compared to the entirety of medical school places available (Medical Schools Council, 2019b), intended to specifically support the matriculation of WP-background students into medical school. However, they are 'large-scale' in the medical school resourcing required to facilitate them; Gateway years require an additional year of curriculum to be added to the start of a school's medical education, and include a specialised selection processes, and elevated student support for admitted students (Curtis et al., 2014a; Curtis et al., 2014b; Brown and Garlick, 2007; Garlick and Brown, 2008). While these programmes have been in existence since the early 2000s, in the last few years there has been a rapid increase in the number of medical schools with these programmes; in 2017 there were only seven established in the UK, to now 17 recognised by the Medical School's Council for 2021 entry (Medical Schools Council, 2020a; Medical Schools Council, 2017a).

It is also worth noting at the onset of this section that literature directly related to Gateway years is quite limited, despite the recent expansion of the number of the programmes. As such, this section draws on a handful of what might be equated to 'seminal texts' about Gateway years (Brown and Garlick, 2007; Garlick and Brown, 2008; Curtis et al., 2014a; Curtis et al., 2014b). While these pieces are informative, they also focus primarily on only two of the earliest established Gateway years at King's College London (the Extended Medical Degree Programme, EMDP) and Southampton (BM6). Other information has been derived from MSC resources, and associated admissions pages on medical school websites (Medical Schools Council, 2020a).

4.5.1.2 Gateway Years: Selection

While they are generally referred to as WP initiatives, Gateway years are perhaps better described as WA. This is because they create a new means of entry for

underrepresented students, though there is some overlap with WP, via recruitment activities. Students who qualify for Gateway year application are often identified well-before application, via other WP means. Figure 2 (on the next page) illustrates how Gateway programmes operate, compared to standard entry programmes, to support the selection and matriculation of WP-background students.

Of note in the figure, the selection process for Gateway Years is highly contextual, and considers discounted performance on academic achievement and aptitude tests (when required). Many Gateway Years actually create a 'cap' on academic achievement, to ensure that only students with non-competitive grades should be considered for this particular entry route. However, in considering the scales of academic achievement for A-Levels and Scottish Highers, most Gateway boundaries are not actually that 'low', with many programmes still requiring B averages for subjects, although these compare to A or A star averages for standard entry medicine (Medical Schools Council, 2020a).

Additionally, applicants must be able to 'prove' that they are from a WP-background. As noted in Chapter 2 (2.3.1), there are a variety of measures that can demonstrate low SEC status in the UK, with no single measure or figure that correlates with being a 'WP' target individual. As such, it follows that medical schools with Gateway years vary widely in their requirements for which applicants can apply, and how WP-background is demonstrated (Medical Schools Council, 2020a). Some common 'WP' requirements are: being a WP Pathways or similar programme participant, first generation student in higher education (like NS-SEC), postcode demonstration (like POLAR), recipient of funds like the UCAT bursary or free school meals, being a carer or care leaver, and school related evidence, such as being from a state-funded or low participation secondary school. Some programmes also prioritise local applicants, to support underserved regions in their proximity. A comparison of all 2021 entry MSC-identified Gateway years is provided in a table in the appendices (Appendix A: MSC-Identified Gateway Years), including comparing academic and WP requirements for entry, as well as key elements of curricula for these programmes, also described below (4.5.1.3).

Figure 2: Gateway to Medicine Years Entry Changes
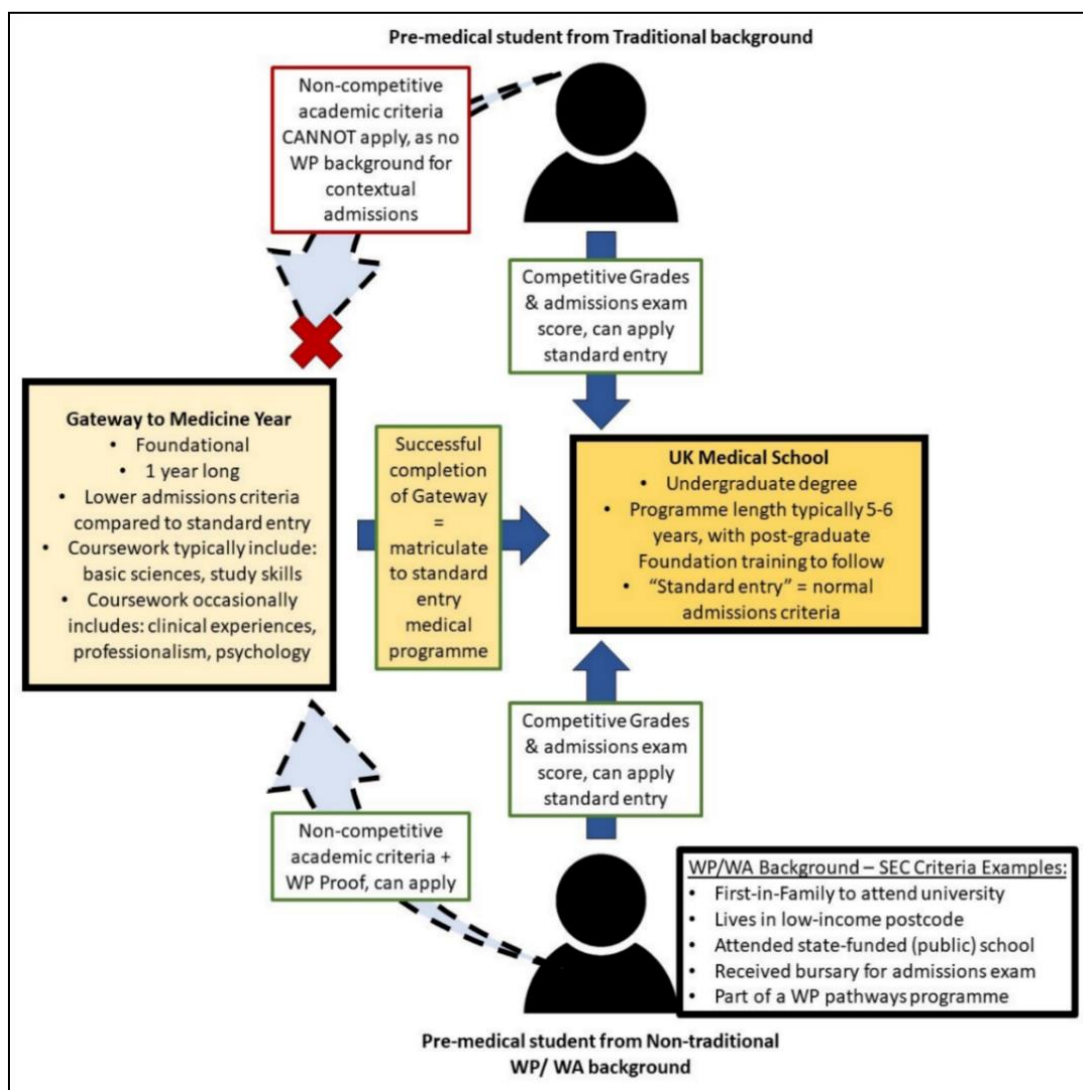
Figure 2: Figure illustrating how Gateway to Medicine programmes operate, compared to standard entry programmes, for UK medical school admissions. Nearly 50% (18/39) of medical schools in the UK have Gateway programmes, as classified by the UK Medical Schools Council (Medical Schools Council, 2019a).

Another important point to note about Gateway years is the distinction between the Gateway year itself, and the following medical education of Gateway students. Moving from the Gateway year to Year 1 of education if often referred to as a "matriculation" point in this doctoral work, included in Figure 2 (above). However, the situation is somewhat more complex than this, particularly considering the heterogeneity of Gateway to Medicine Years. Most Gateway years are classed as a unique entry programme, including unique UCAS codes required to indicate programme of interest/matriculation when applying to medical school in the

national application system. However, in the majority of medical schools, Gateway years offer a specialised curriculum to the start of medical school (detailed) in the next section. Once the Gateway year is completed, students who progress join the standard entry cohort. For this reason, the term "matriculation" is used in this thesis to denote students joining the standard entry programme, despite being admitted on a different route. It is also worth noting that if students do not successfully pass their Gateway year, they cannot continue to Year 1 (just as students who do not pass any year must often retake a year or module).

In addition, there are a some medical schools with Gateway years that may also require Gateway students to complete additional selection requirements by the end of the Gateway year, in order to progress to Year 1 of medical school. For example, University of Aberdeen does not use the UCAT as a selection tool for admission to their Gateway year, but requires it from students to progress to Year 1 (Medical Schools Council, 2020a). These variations in selection are as variable as the subsequent structure and curricula of Gateway years.

4.5.1.3   Gateway Years: Structure

There are no published national curriculum guidelines, and these years are often designed to support matriculation to their specific associated medical school's standard entry curriculum. Gateway years even vary widely in name; in addition to 'Medicine with a Gateway Year' and 'Gateway to Medicine', other names include: 'Gateway2Medicine', 'Foundation Year', 'Glasgow Access Programme (GAP)', 'Medicine with a Health Foundation Year', 'Extended Medical Degree Programme (EMDP)', and 'BM6' (or 'Year 0' programme).

Generally, curricula include a high proportion of sciences, specifically biology. Students on Gateway years are accepted with lower grades than would normally be accepted for standard entry. The idea held by many is that students subsequently need supplemental science education due to the relatively low A-Levels grades, in order to be able to perform on par with standard entry peers when they join Year 1, and in order to 'smooth the transition' into medical school via the Gateway Year and ensure academic success. However, there is the concern that too much emphasis on

the differential attainment of Gateway students could reinforce a deficit model of education.

Additionally, many, though not all, Gateway years include modules or courses in study skills, professionalism, psychology, and/or clinical skills. These are intended to address the other aspect of Gateway selection – that these students have had 'barriers to their learning' or different experiences, associated with their WP-background. This means providing Gateway year students with experiences to foster their growth as medical students, and provide skills that will help them be competitive and succeed in medicine, needs to also be a priority. For example, if a Gateway student was unable to obtain clinical work experience prior to applying to medicine, offering introductory clinical skills may be of benefit to them, and create equity in opportunity compared to peers who may have abundant pre-medical clinical exposure. Furthermore, as Garlick and Brown (2008) note about their Gateway year, "[some] students need extra reassurance that their experiences and beliefs are of value" (Garlick and Brown, 2008:1113). Indeed, fostering student growth and belonging, often via higher levels of student support, is a key feature of Gateway Years (Curtis et al., 2014b). This may also include implementation of 'buddy' systems, or medical school mentoring schemes, for current and former Gateway students, as well as considerations for financial support like small bursaries or scholarships.

If students complete their Gateway year, they continue on to Year 1 of medical school, reiterating the clear pipeline element of these programmes, although some schools have additional selection requirements between the Gateway and Year 1, as noted above. For almost all Gateway programmes, at this point, additional support and educational opportunities cease, and Gateway year students are afforded the same access and support as all of the other Year 1 medical students. One notable exception to this is the EMDP at King's College London, that provides more longitudinal student support for students admitted via this pathway (Garlick and Brown, 2008). Instead of being a 'traditional' yearlong Gateway year, the EMDP is split across the initial few years of medical school for these students. Still, the EMDP continues to be classed as a Gateway programme by the MSC. Curtis et al. (2014b)

also posit in their work that a potential weakness of their BM6 programme is that students may be accustomed to higher level of support in the 'Year 0', and thus be challenged by the adjustment when joining the BM5 cohort. However, there is no direct comparison of these models of student support that exist in the literature.

4.5.1.4 Gateway Years: Are they meeting their goals to widen participation?

Gateway years have been shown to be moderately successful in increasing the numbers of underrepresented students in medicine (Medical Schools Council, 2019b). However, these programmes also have slightly higher attrition rates, compared to standard entry groups. Garlick and Brown (2008) reported retention for the EMDP as 90%, compared to 97% for standard entry (SE). Curtis et al. (2014b) reported a similar rate of 90% for their BM6, compared to 95% for SE; this was noted as specifically the rate for initial years of medicine (Year 0 to Year 1, or Year 1 to Year 2, for the respective programmes).

More recent data aligns with these findings, and provides even more detail on the function of Gateway years, nationally. Curtis and Smith (2020) compare undergraduate outcomes for Gateway year to standard entry students, with data derived from the UK Medical Education Database (UKMED). This study includes student data from 2007 to 2012, representing three of the UK's longest running Gateway years: King's College London, The University of Southampton, and Norwich medical school. While the years and numbers of programmes included are relatively small, the authors note they were limited by data availability in UKMED; nevertheless, this study greatly furthers knowledge about Gateway years. The study compares medical school outcomes and attrition of students, including: medical school performance (Educational Performance Measure, EPM), the Prescribing Safety Assessment (PSA), and Situational Judgement Test (SJT). All of these measures are collected at the end of undergraduate medical education in the UK.

This work from Curtis and Smith supports the evidence from earlier literature related to progression differences; Gateway students were more likely than standard entry students to be required to repeat a year during their medical education. Further, of their sample, only 83% of Gateway year students compared to 96.1% of standard

entry students received their medical qualification, with no 'failure to progress' (i.e. – academic failure, left in bad standing, or not permitted to progress, including year repetition) in their records. It should be noted, though, that these percentages were from a sample of 555 Gateway students and 3760 standard entry students, meaning that actual numbers of students with negative progression data were somewhat small. This study also found that while standard entry students scored more highly in all of the outcome measures detailed above, these differences greatly diminished when controlling for academic achievement on entry; the difference also disappeared completely for the SJT. Additionally, there was a noted wide distribution of EPM scores from Gateway students. Both these findings support the notion that once admitted, Gateway students can 'succeed' academically at rates fairly similar to peers who likely had academic advantages in secondary education. And, ultimately, the paper considers Gateway years to be 'successful' in the sense that their admitted cohorts are far more diverse compared to standard entry cohorts (without joining Gateway students), confirming that these programmes are actually widening participation for underrepresented groups.

While all this evidence is supportive of Gateways as a potentially powerful pipeline, it does raise a number of considerations. The first relates to the absolute numbers of students entering these courses. Cohort sizes are small, typically averaging around 30 students. While the findings are generally positive from the Curtis and Smith work, the advancement of WP via this method is incremental, compared to the broader system of medical education. Additionally, given these smaller numbers, the progression rates do raise some concerns and warrant further exploration. If 17% of students have 'issues' in progression, out of only 555, that adds up to be quite a number of cases to address. Furthermore, being more critical about the cost-benefits of training students via these routes is warranted. Each of these data points represents real-life students, requiring student support and academic guidance when there are concerns around progression. Understanding the reasons for attrition challenges may be key in getting Gateway students to comparable standard entry progression rates, both for the sake of the students, and medical school resourcing. Greater rates of attrition could highlight the need for more support

mechanisms, or reflect on the need to fine-tune selection methods, to ensure more student success.

Along this line of inquiry, the Gateway years themselves can be costly to set-up and run; they require a new year of curriculum, student support, and dedicated educators, as well as admissions teams creating completely new systems of medical school entry (Curtis et al., 2014a; Curtis et al., 2014b; Garlick and Brown, 2008). And, given the continued costs of training medical students (O'Brien and Korszun, 2021), this again frames the attrition differential for Gateway entrants across their medical education as problematic. The costs-benefits and acceptability of these years warrant critical examination, especially from medical school staff, to ensure that there is a match in expectations for what these programmes hope to achieve, and their success in that respect.

Finally, while the Curtis and Smith work is very informative in terms of quantitative findings, it does not include qualitative elements relating to student experience. The previous studies described above have some anecdotal and evaluative insights, but no formal qualitative research with Gateway students. And while Gateway years create a contextually informed route to medicine for WP-background students, it does not dissipate their disadvantage nor background (D'Silva et al., 2019); financial pressures, for example, may affect performance and progression (Anane and Curtis, 2019). Although just conference proceedings, these studies from D'Silva and colleagues, and Anane and Curtis, were conducted at the University of Southampton, one of the established Gateway year medical schools noted in Curtis and Smith (2020). As such, these findings warrant more attention and further exploration, especially at a more national level. Given that students from WP-backgrounds can experience baseline stigma and 'otherness' (Brosnan et al., 2016; Southgate et al., 2017; Bassett et al., 2018), the 'pipeline' element of Gateway years also needs to be understood more, to see if the addition of the year to medical education significantly alters progression for these students.

4.5.2   Pipelines and Gateways: in Summary

While a potentially promising means of WP, there is a paucity of research on the function of the UK-specific medical education pipeline, Gateway Years. The lack of published work examining these programmes is of concern, although existing publications do an excellent job of describing them, and there is more recent quantitative assessment of this entry route. In particular, the experiences of students on these unique pathways into and through medical education should be explored, particularly at multiple institutions, given the expansion of these years. This consideration for student lived experience also aligns with the final mechanism of WP considered in this chapter.

4.6   Retention and Progression as a Facet of Widening Participation

Retention is a more overlooked element of WP, particularly compared to the spheres of outreach and selection (McLachlan, 2005). There seems to be a large focus on representation, and 'boosting' the number of students *accessing* and *participating* in medical education, and not so much on how they are *progressing*. And in considering the discourses for WP, presented in the previous chapter (3.3.2), it could be argued that without consideration of progression, these goals may be futile; education will continue to lack diversity, there will be continued issues with the healthcare workforce, and a sense of social justice may not be achieved. As noted by Milburn (2012), 'getting ready' and 'getting in' are only two facets of HE; analysis also needs to including 'staying in' and 'getting on' to truly realise social mobility. Retention and progression in WP also call for the consideration of other EDI elements such as inclusion and belonging, detailed in Chapter 2 (2.2.1).

Still, it would be remiss to not acknowledge of the length of this section of this chapter; compared to outreach and selection, there is very limited research on how WP-background students progress through UK medical education. Students that share characteristics with 'WP-background' can face unique challenges in applying to medicine. And research indicates that these challenges persist, and may even be exacerbated, upon entering the medical education setting. Concerns for these student groups may include balancing financial concerns (Anane and Curtis, 2019; Beagan, 2005), managing family expectations (Mathers and Parry, 2009), and

experiencing 'imposter syndrome' (Southgate et al., 2017). Findings from these studies indicate that these challenges are unique, and shaped specifically by the WP-background of these individuals. However, some work also suggests that there are positive aspects that can be garnered from a working class background, such as pride and solidarity with greater populations of people (Southgate et al., 2017).

Understanding WP student progression needs to go beyond quantitative predictions, to reveal how medical schools can work more actively to support and retain students, based on the successes and shortcomings frequently experienced by students in these groups. This student-oriented focus may also aid in counterbalancing current narratives that support deficit models of education for WP-background students (Yates and James, 2006; Burch et al., 2013). This might be particularly important for grappling with the power imbalance that exists currently in medical education, with institutions tending to hold more 'power' (Shaw et al., 2018). Acknowledging and understanding power dynamics may be crucial in moving forward with challenging such disparity, to ultimately benefit all; it might ultimately present issues around WP as institutional, not student, deficits. This notion of power, and how to use student experiences in particular to re-consider power, will be revisited throughout this doctoral work. Lastly, this consideration for the importance of progression may have real impact on understanding the realities of discourses of WP in medical education; to garner the benefits of diverse cohorts and potential workforces, these individuals have to remain in the system. It is not enough to hope that selected students *survive* the system of medical education; more research needs to be done so that policy and practice can be better informed on how to support students to *thrive* in medical education.

4.7   Chapter Summary

There is no one, and perhaps no 'right' way to approach WP and WA, as shown in the many examples illustrated in this chapter. And yet, reviewing the body of work in the field of medical education widening participation, there is clear lack of understanding in some areas. Outreach mechanisms, while popular, do not have well-described 'impact' frequently, beyond simple evaluations. In the field of selection, there is a fair amount of research on predictive factors, to try and

approach admissions in more evidence-based ways. But, understanding on how changes to selection play out 'on-the-ground' and might be interpreted in light of more human factors, is lacking. And with the example of Gateway to Medicine years, the amount of time, energy, and personal investment from facilitators and students is obvious. However, the impact of these years, particularly in considering alternative means of WP, has not been thoroughly explored. This also aligns with the general lack of consideration for progression and retention as the 'final' part of WP.

By evaluating current literature, this chapter aimed to not only describe the WP landscape of medical education, but highlight any major gaps in knowledge for this field. In the next chapter, these gaps and mechanisms are framed in the context of the previous two chapters, considering how WP mechanisms are situated within the broader scheme of diversity-oriented work in the field. This is presented as the conceptual framework for this doctoral work. The next chapter will also then identify the specific aims of this thesis, and identify the populations of study at the 'heart' of WP, the humans that make these mechanisms happen.

Chapter 5: Conceptualising Widening Participation for Critical Examination

5.1 Chapter Introduction

In Chapters 2- 4 of this doctoral work, the language, reasons, and mechanisms behind widening participation in medical education were reviewed. This included critical appraisal to describe the current 'state' of knowledge in this field of study. This chapter synthesizes the previous literature into a succinct conceptual framework, that considers all described elements. Based on this framework, the research gap that this doctoral work aims to address is identified. Following, the specific aims this thesis will address are presented.

5.2 Conceptual Framework for Widening Participation in Medicine

Conceptual frameworks are key in framing and organising the system of concepts, assumptions, and theories that guide research pursuits (Maxwell, 2005; Bordage, 2009). In a piece that aptly describes the role of theory, theoretical frameworks, and conceptual frameworks in health professions research, Varpio and colleagues define a conceptual framework as a "researcher-constructed, logically developed argument justifying the need for the research study… It answers questions of 'Why is this research important?' and 'How does it contribute to new knowledge?'" (Varpio et al., 2019: 991). Conceptual frameworks are key in study design, but can be generated more deductively (prior to data collection) or inductively (evolving with insights). For the present work, the framework was developed more via the former, but was informed to some extent by additional and constant reading of up-to-date literature, and by study findings; as such, it fell somewhere along the continuum of deductive and inductive generation.

A visual representation or map of a conceptual framework can be useful in simply conveying to others the many aspects that may inform any given research (Maxwell, 2005). As such, the conceptual framework for this doctoral work is presented in Figure 3, on the next page. WP mechanisms are at the centre of the model, to show them as the centre of the research, and as the focus of broader ideas. The mechanisms are defined broadly as the categories described in Chapter 4: outreach,

selection, and retention. Additionally, pipeline and Gateway programmes are shown separate, as a modification to selection and entry to the system of medical education. Arrows indicate the connection between these mechanisms, though variable; for example, an individual may participate in outreach to be considered for modified selection to medical school. However, this is not always the case; an individual could be 'targeted' at the selection stage.

Figure 3: Conceptual Model of Widening Participation in Medical Education
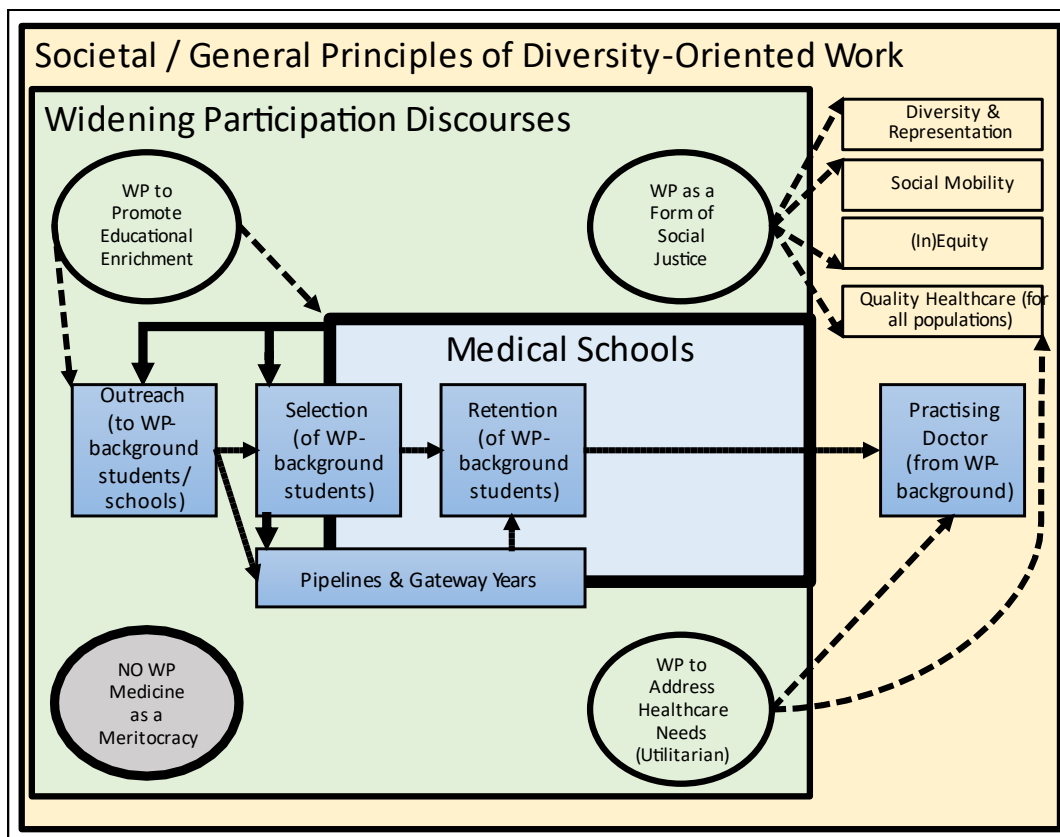
Figure 3: A visual representation of the conceptual framework for this doctoral work. The overarching mechanisms that are the focus of inquiry are positioned in the centre, surrounded by the 'context' that informs WP actions, and this work.

In this conceptual model, these mechanisms, and medical schools, are situated in the broader scope of 'WP' and diversification ideals, demonstrating the context of this work. Some of the perspectives explored in detail in Chapter 2 and 3 are noted. In particular, the primary WP discourses described in Chapter 3 (see 3.3.23.3.2) are depicted in relation to the components of WP they act on. Educational enrichment aligns with actions on outreach (as primary and secondary educational enrichment),

and medical school. The utilitarian healthcare argument aligns with outcomes outside of medical school (concerning practising doctors and healthcare principles). And the social justice argument reinforces broader societal principles, as outlined in Chapter 2. The position of medicine as a meritocracy is also detailed, not as a factor to promote WP, but as an important cultural perspective in the field that does not support the WP system.

In addition to this visual representation of the conceptual framework, and in considering the first of the aforementioned questions posed by Varpio et al. (2019), it is important to explicitly convey why this doctoral work is important. The conceptual framework for this thesis situates the focus (widening participation mechanisms in medical education), at the centre of other key societal issues. Notably, WP mechanisms and their function are at the heart of diversification ideals. If diversity initiatives attempt to address larger societal issues, as explored in Chapter 3 (3.2), then better understanding WP mechanisms will *hopefully* result in improved function of these mechanisms. With improved function of these mechanisms, society might benefit. For example, by doing successful outreach to diverse student populations, then there may be more applicants and matriculants from these groups in medical school, leading to diversity in healthcare practitioners, and eventually, better quality healthcare for all in society. This conceptual model aims to convey this importance and potential; while the focus of this doctoral may be centred and more specific, there is potential to improve the broader field of medical education, medicine, and society.

It is worth noting here that these may be viewed as lofty ideals, an aggrandisement of the impact of widening participation. And indeed, there are those in the field that may also argue that it is egotistical to believe that critical changes to curricula may 'transform' trainees, healthcare systems, or society. Whitehead et al. (2012) argue that it is hubris for educators to believe that transformation of curricula can lead to more than perhaps individual level change, noting "curriculum may be able to make individuals more aware of some of the forces at play; it cannot, however, shift inequities that are systemic" (Whitehead et al., 2012: 536). Still, this work, and the studies it encompasses, challenge this notion. As the conceptual model notes,

medicine and medical education are situated in broader society. Therefore this 'corner' of the system should share responsibility for shifting inequities that pertain to it; promoting "awareness" is not enough. Change on the macro-level cannot happen without real change on more meso- and micro-levels. By critically examining WP mechanisms at these various levels, and providing recommendations for practice, policy, and theory, the hope is that this doctoral work can help to play a small part in this shift from awareness to action. It is the position of this researcher that this work is thus not grounded in hubris, rather hope (hooks, 2003; Jacobs, 2005). This belief also links to the theoretical groundings of this work, that will be explored subsequently in the next chapter (6.7.2).

5.2.1   Identification of Research Gap

Specifically defining the research gap of this doctoral work addresses the second question about conceptual frameworks that Varpio et al. (2019) pose; how does this work (aim to) contribute to new knowledge?

As already described, particularly in Chapter 4, there are many avenues of exploration in WP in medical education; it might be considered a more recent 'subfield' of medical education research. As such, the process of study design for this work, and potential gaps that could be addressed were numerous. Chapter 6 details more on the 'real-world' limitations and requirements that guided this doctoral work, as part of methodological considerations. However, via examining the literature and mapping the field of understanding in a conceptual model, it was clear that Gateway Years as a specific means of WP in UK medical education were perhaps the most under-researched WP mechanism in the field. Particularly in light of the work presented in Curtis and Smith (2020), strengthening qualitative understanding, and examining the 'journey' of a Gateway student, were identified as the major 'gaps' this thesis would attempt to explore. This could also work to address generalisable gaps in the understanding of progression, attrition, and retention for WP students.

However, also as indicated by the review of literature in Chapter 4, outreach and selection mechanisms could also benefit from contribution of new knowledge.

Drawing on a wider evidence base, looking at the elements associated with medical school WP (outreach, selection, retention), this work could also contribute to new knowledge by not just considering gaps in the field, but gaps in perspectives of the field, at these stages of interventions. In outreach, this led to the decision to not complete a study with students who participate in outreach; as identified in Chapter 4 (4.3), numerous works like this exist (Martin et al., 2018; Moore et al., 2013; Greenhalgh et al., 2004; Mathers and Parry, 2009; Gore et al., 2018). Instead, the outreach work would target facilitators, to understand generalisable coordinator experiences better. And while there was significant empirical research in the field of selection, and its intersection with WP/WA, consideration for the role of human actors, and their views on selection, were notably missing. Considering, again, not just the mechanisms to be investigated, but the individuals at the 'heart' of these mechanisms, was key in the research process.

Given all these points, it was determined that this doctoral work could contribute to the field by critically examining outreach, selection, and retention as interactive elements of WP, from the perspectives of different groups involved with these processes. This might help contribute new knowledge and understanding of how each of these individual elements positively or negatively contributes to the goals of WP, but also, how to consider them together, as part of a WP 'lifecycle' for student progression. And ultimately, this could generate new knowledge on how mechanisms of WP in medicine act to hopefully address the societal issues they aim to remedy.

5.3   Aims of this Doctoral Work

With the identification of the three broad areas this work would explore, and the more specific gaps, concise aims and research questions were generated. As noted above (5.2), this research process was both inductive and deductive in nature, developed from knowledge of literature and the conceptual framework, but also via the stages of research. As such, instead of presenting more specific research questions here, without context, these are detailed in each of the subsequent results chapters (see sections 7.3, 8.3, 9.3), with other study-specific details. But, the overarching guiding aims of this doctoral work were as follows:

- Explore generalisable views on outreach, and its role in supporting widening participation

- Understand facilitator perspectives in modifications to selection and curriculum, as a means of widening participation

- Explore the lived experience of students who progress through medical education via specialised widening participation routes

- Consider the intersect of outreach, selection, and progression/retention in supporting widening participation that aligns and achieves diversity discourses

These aims, how they were answered, and their relation to the more specific research questions presented in the results chapter, will be revisited in the Discussion chapter.

5.4   Chapter Summary

This chapter presented the conceptual framework for understanding widening participation in medical education. This framework was synthesized from the literature review, presented in Chapters 2-4, but also informed by the subsequent work of this thesis. The research gap, aims, and research questions that will be addressed via the studies in Chapters 7-9, have also been outlined. However, before this work moves onto these 'results' chapters, the overarching philosophical assumptions and methodological choices that guided all elements of the work need to be established.

Chapter 6: Overarching Theoretical and Methodological Considerations

6.1 Chapter Introduction

This chapter provides an overarching perspective on the methodologies used in this doctoral work, and the theoretical reasoning behind them. As mentioned in Chapter 1 (see section 1.6), this chapter will occasionally employ first person narrative, as this can best convey personal viewpoints as they relate to research values and approaches. It is important to understand these views, as they influence the paradigm, or set of scaffolding philosophical and research beliefs, that underlie any research project (Guba, 1990; Guba and Lincoln, 1994; Lincoln et al., 2011).

Early on in the PhD process, myself and a cohort member grappled with how to best approach the vast landscape of paradigms. We were pursuing doctorates in philosophy, but our backgrounds were situated in the sciences. Therefore, philosophy had not been a standard part of our previous training (although I now recognise this to be perhaps a flaw in most modern science education). My philosophical forays to this point had only included one required undergraduate course in philosophy, from which I only had a faint recollection of reading Plato's *Allegory of the Cave*. My cohort member and I did much reading about the qualities of common paradigms (Avramidis and Smith, 1999; Bergman et al., 2012; Wahyuni, 2012), listened to podcasts (Royal College of Physicians and Surgeons of Canada, 2019), and had many a discussion in our shared PhD student office, about 'paradigms' and how to best define each of ours, and approach them. In the midst of this hard work, we recognised that we were likely not alone in our philosophical struggles, and ultimately co-authored a paper (Brown and Dueñas, 2019) designed to introduce basic science educators to the world of research paradigms, in an approachable way.

That paper presents two figures, meant to guide researchers through the basic 'building blocks' of paradigms, modified from the work of Grix (2002). This chapter is structured in the same orientation as those figures, but here is specified for my work as the author of this doctoral work. Figure 4, presented on the next page, highlights

features of my personal paradigm building blocks, which are then explored in greater detail in each of the sections below. These include: axiology, ontology, epistemology, methodology, methods, and sources. The latter two, methods and sources, are combined, and considered with particular focus on research ethics. This is because the details of these two elements more directly correlate with specific research studies, and as such, each results chapter features a specific methods section. Still, there are overall research ethics to be considered, from a methodological perspective.

After establishing my viewpoints on each of these elements, the chapter then ends with a section on pragmatism and critical theory. These are two established paradigms in the field of research philosophy that most align with my theoretical positions for all the aforementioned 'building blocks.'

Figure 4: My Paradigmatic 'Building Blocks'
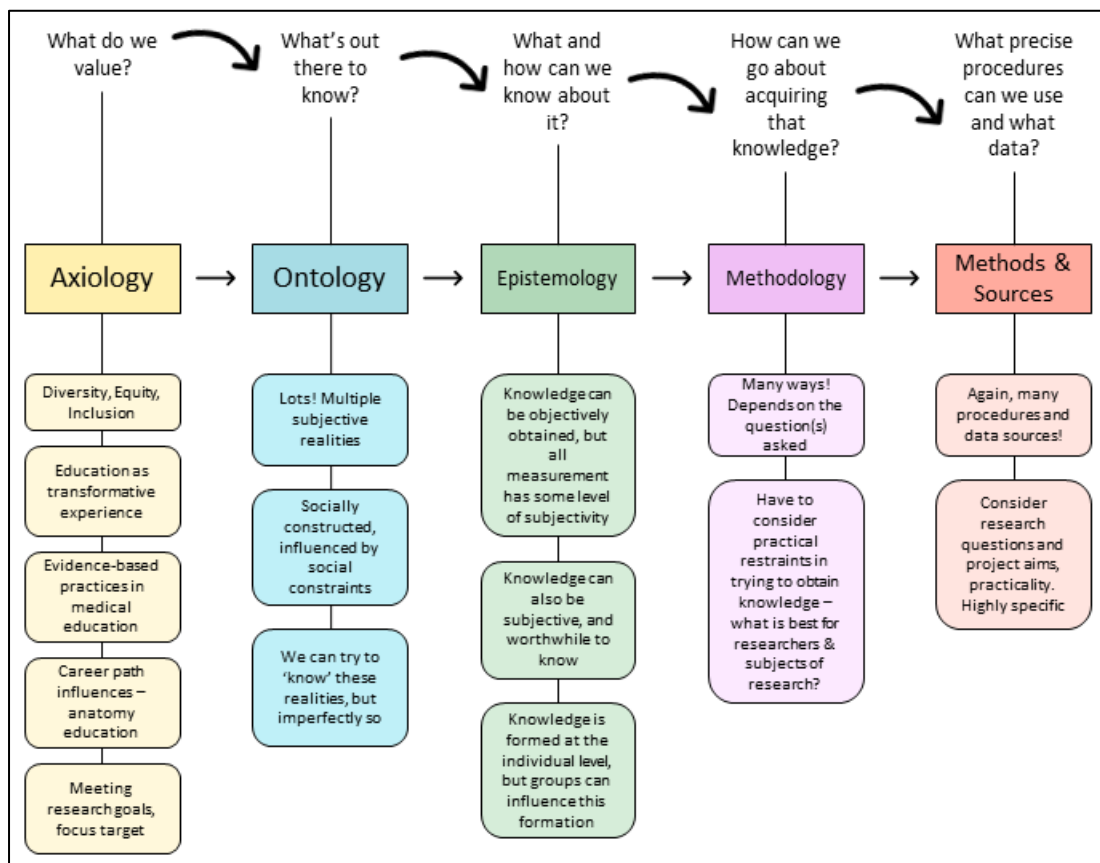
Figure 4: The generic 'building blocks' of paradigms, adapted from Brown and Dueñas (2019) and Grix (2002). Below the generic building blocks, and key questions they pose, are brief descriptions of my stance. These are explored in greater detail in the sections below.

6.2   Axiology

Axiology is defined as the study of the nature of values, or description of the things that hold value in certain settings (Deane, 2018). Considering axiology in research, it is concerned with questions of not just 'what do we value?' but also 'what holds value?' in a particular field of research (Biedenbach and Jacobsson, 2016). As such, the description here of my axiology is two-part. First, context and setting link to the 'what holds value' element of axiology. This section describes the external drivers in this doctoral work. However, such external considerations needed to align to internal motivations to create research. As such, the second section of this sub-chapter considers that, focusing on 'what do I value?' as the author and primary researcher of this work. This part of the thesis is the most personal, and includes reflexivity, or an examination of my own social position (Berger, 2015), examined from the perspective of how this may have influenced research processes.

6.2.1   Context & Setting

This section details the external factors that led to the pursuit of this research.

6.2.1.1   Funding & Thesis Focus

This doctoral work was funded by the Hull York Medical School, as one of a number of PhD fellowships. In addition to these, and in the context of a medical school expansion, two curricular innovations were also planned. These were the establishment of a longitudinal-integrated clerkship (McKeown et al., 2019) and Gateway to Medicine year (detailed in section 4.5.1). These two 'innovations' were thus required to be the focus of two of the PhD research posts. I was awarded the PhD scholarship linked to the work with the Gateway to Medicine year. This was my first choice of the possible research projects.

This context is important in two ways to the eventual research that was conducted. Firstly, Gateway years was the *required* topic focus for my doctoral work. I was, and am, required to produce doctoral work that is linked to Gateway to Medicine years. As such, two chapters of this thesis approach selection and curriculum, as well as student progression, from the specific viewpoint of closely examining Gateway years. However, the second consideration is for the flexibility in the research proposal, and

eventual work. While the focus needed to be linked to Gateway years, the methodology, methods, sources were all entirely up to myself as primary researcher, in consultation with my supervision team, of course. This flexibility is what ultimately led to this thesis including not just chapters exclusively related to Gateway years, but research that could consider the 'journey' of a WP-background student, via outreach. This outreach avenue, as well as my particular interest in anatomy education detailed in the next section (6.2.2.1), is what ultimately led to a broader perspective of WP in medical education being the focus of this work.

6.2.1.2   Doing a PhD in a Pandemic

There is another context element that should be acknowledged in considering the setting for this research. My PhD commenced in October 2018, and there was still significant data collection for some components ongoing in March 2020. This coincided with the emergence of the coronavirus (COVID-19) pandemic. As such, the conceptualisation of this doctoral work was not done in the 'same world' as the one in which it happened; so much of the research setting and context changed rapidly over the course of 2020 and into 2021 (Brown et al., 2020; Finn et al., 2020). As I sit completing this thesis, I am more than 5000 miles away from the medical school, and have not had access to research offices in over a year. Still, I am fortunate that much of the conceptualisation of this work considered it advantageous to do remote data collection, as many research projects have needed to be remote, or risk indefinite pause or serious re-purposing.

Besides the human factors associated with research and work environment, why does a global pandemic shape the external motivators for this work? This is because it also has solidified my stance that this work matters more, now than ever. The focus of this thesis is WP in medical education. As described in Chapter 3 (3.2), WP is an epiphenomena of the inequities society face. And COVID-19 continues to highlight how rampant inequalities are (Bowleg, 2020). Students who might have had a hard time achieving a place in medicine, due to socioeconomic background, may be in even worse positions now. School has moved to virtual delivery and assessments altered, possibly perpetuating prior educational achievement gaps (McManus et al., 2020). Many of the forms of WP outreach, described in Chapter 4 (4.3), have been

halted. This also resulted in modifications to the interview schedule for this doctoral work's outreach examination in Chapter 7 (7.4.3), which explores anatomy outreach specifically.

Ultimately, we do not yet know how much impact this worldwide disruption has had, particularly for those most disadvantaged in society. However, this should speak to the importance of WP-related research, now more than ever. If best practices are better understood, it might help to mobilise the recovery of WP initiatives and goals, when we move to a 'new normal' on the other side of this health crisis.

6.2.2   Reflexivity Considerations

Reflexivity, in a research context, is the examination of one's own beliefs, motivations, or judgements, to understand how these may influence any given research project (Dowling, 2006). This section describes some of the internal motivators that influenced the pursuit of this doctoral research. Reflexive practice, and individuals' assumptions, should be key in any research production (Morgan, 2007; Deane, 2018). Further, as detailed in the Methodology section of this chapter (6.5), this doctoral work draws largely on qualitative methodologies. In qualitative research, reflexive practice is key (Dowling, 2006). This is in part because qualitative research does not have the same parameters for validity/reliability that a more quantitative approach may have. Therefore, the generalizability, transferability, and credibility of the work relies more heavily on the researcher's ability to be reflexive.

6.2.2.1   Educational Background & Career Focus

My educational background has played a large role in not just the pursuit of this research, but also in the design of the studies included. Educated in the United States, I have a Bachelor's Degree in Psychology with a Biology Minor, and a Master's Degree in Modern Human Anatomy with a Certificate in Anatomical Sciences Education. For much of my undergraduate degree, and part of my Master's, I considered myself 'pre-med,' or a student with the intention to apply to medical school (as noted in Chapter 4, section 4.2, this is only a postgraduate degree in the USA). But via my experiences with anatomy education in my Master's, ultimately decided that I did not want to *be* a medical student as much as to *teach* them. This

led to my interest in a PhD, to ensure that I was sufficiently trained at the educational level many medical schools require for Lecturer (UK) or Assistant Professor (USA) posts, and beyond. I have been teaching in some capacity for the past four years, mostly as a teaching assistant in the anatomical sciences, but also more recently in medical education (postgraduate training), professionalism, ethics, and humanities.

Reflecting on this educational background and career interests, in the field of academia, I consider myself an educator first, and researcher second. As such, my research tends to 'lean' towards evaluation, because I believe that such research should ultimately help inform educational practice. Rarely do I design research that is predominately theoretical; there is always a practical consideration in my mind. How will this help students? How will this help educators? How will this help the field? I think these reflective, internal questions do appear in the present work. All of my results chapters in this thesis, while employing rigorous methodology and using theoretical interpretations, try to offer practical implications to findings.

Also of note, related to my educational background, and the role of anatomy and the basic sciences in my training, these subjects are a facet of the present work. I love the subject of anatomy, love to see the 'ah-ha' moments students have when learning such topics, and believe the subject is core to medical and health professions education. As such, when considering the study of outreach, anatomy-related outreach immediately sparked my interest. I believe in the inherent value of understanding, with more generalisability, how such outreach functions, and particularly how it supports students from WP backgrounds. It is highly possible that any other researcher might have approached outreach from a more general or medicine-specific angle. But I value anatomy, and thus anatomy is the focus of a chapter in this doctoral work.

6.2.2.2   Personal Identity Factors

Beyond my educational background as a driver in this research, there are also a few key personal identity factors that should be discussed. Reflexivity posits that even in the most objective studies, there are characteristics linked to our identity that

cannot be suspended (Berger, 2015). As such, it is important to recognise these and their potential influence in research. I will in brief discuss my: nationality, 'class', and ethnicity; these are just a few intersectional identities I hold, that may have been of particular importance in this doctoral work.

As an American national, and one that was 'pre-med' as discussed above, I come a very different educational system, including medical education. The structural differences between the UK and USA were discussed in Chapter 4 (4.2). Doing a PhD in the UK has involved learning the ins and outs of a rather different educational system; I had to learn the language of UK medical education- GCSEs, A-Levels, foundation years, and so on. But this adaptation to new terms was not the key factor that I think may have influenced by research approach; training in any capacity often involves learning specific lexicon. I believe that perhaps my perception of medical education, and the schema of identity of a medical student, is what may have been influential. In the USA, with medicine being only a graduate degree, all students are 'mature'. This is a stark difference from medical school in the UK, where standard and Gateway year entry are comprised of school leavers. As such, topics such as professional identity, fiscal responsibility, the realities of medicine, I feel are a bit more standard for early year medical students in the USA, compared to the UK. Holding this view, I recognise that, particularly with my research with students, my approach to such subjects may have influenced my research. I could have projected comfort discussing such topics, with the expectations that my participants would immediately understand. My nationality, and its educational system, may influence the very way I approach discussion of said educational system.

Next, I turn to 'class'. I consider myself middle class. But, my own education and cost of attendance for university has been funded predominately by student loans, particularly considering the cost of higher education in the USA. Any 'luxuries', like my car, new clothes annually, or university holidays for example, were paid for by part-time work; during university at one point, I was working three part-time jobs to ensure a sense of personal financial security and freedom, for myself and my family. Even in the context of the current research, this thesis is funded by a university scholarship. As an international student, I was not eligible for a standard research

stipend that covered both the University fees and provided support for living costs. Fortunately, I have been well supported by a supervision team that arranged a graduate teaching assistantship as a means of regular stipend income, and have always kept their eyes and ears out for supplemental work for income. All this to say, I often find work refreshing, and a true joy. From working with pre-schoolers, advising international students, scribing in a hospital, to teaching Gateway students – these are some of my favourite experiences in higher education. Still, it would be remiss to not acknowledge how these experiences position me in closer proximity to the topics of my thesis: WP/WA. I can relate to feeling financial pressures, while trying to focus on education. As such, I genuinely believe in the work, because it is by the way of a lot of support, debt, and hard work that I have received my own education. As such, I have close proximity to my research topics. Yet, I see this familiarity as a strength; I can use empathy and understanding to guide my methodology and methods. I am passionate about this research, because I am close to it.

Lastly, I want to acknowledge my ethnicity. While not the focus of this thesis, Chapter 2 (2.2.4) highlights how there is an element of intersectionality in all diversity-oriented work. There are associations between various traditionally underrepresented identities in medical education. While this work focuses on the domain of socioeconomic status as the guide of WP in the UK, it would be remiss to not recognise the struggles other individuals face, related to gender, race, and ethnicity, amongst other identities. In addition to my class background, I am also of mixed ethnicity, being half Mexican American. Growing up this way has changed the way I view the world, with early experiences that shed light on some understanding of systemic oppression, inequity, and injustice. My ethnic identity is complex, and well beyond the remit of this doctoral work, but these experiences have shaped my approach to research. I find it natural to consider power relations and societal constraints in research, because I grew up witnessing and hearing regularly about how these factors have influenced my heritage. And while I have directly experienced microaggressions and tokenism related to my ethnic identity, I recognise that I still carry a lot of privilege, particularly white, educated privilege,

that also separate me from other racial and ethnic groups. All these considerations lend to particular paradigmatic leanings, discussed later in this chapter (6.7). These also guide my consideration of which research projects I prefer to be involved in. If I did not hold such experiences, I might not be drawn to research in the field of WP.

6.3   Ontology

Ontology is the branch of philosophy that deals with the nature of reality (Bunniss and Kelly, 2010), and asks researchers to consider, what is reality? This is a very complex question and there are many facets of being that can be ontologically explored, but in short, I ascribe to the belief that there are multiple subjective realities. You – the reader of this thesis, myself, my supervisors, my study participants – every individual has their own version of reality. These realities are socially constructed, and as such, are influenced by social constraints. Our experience of reality can be influenced by the actions of others. And lastly, while we can try and understand various notions of reality, including our own, this can only ever be done so imperfectly.

As for ontology's influence on this research, the recognition of various forms of realities allows for exploration of many different perspectives on WP-related work and experiences. However, the findings from this work will never be perfect, or fully capture the experience of reality for those involved. It can just contribute to our sense of knowledge.

6.4   Epistemology

Epistemology is the branch of philosophy concerned with knowledge - what is knowledge, and how is it acquired (Chilisa and Kawulich, 2012)? Knowledge can be understood as the understanding or awareness of something; if a researcher is studying a particular phenomenon, epistemology is concerned with how you come to understand that phenomenon. For example, 'objective' or 'deductive' measures could quantitatively assess that phenomenon.

However, I believe that even the most 'objective' measure includes some level of subjectivity, or inductive approach. I also believe that subjective knowledge exists, and that it can be as important as any objective measure. Lastly, I believe that

knowledge exists at the individual level, aligned with realities, but just as with ontology, the formation of knowledge can be socially influenced.

6.5   Methodology

Following from the above, I align with the philosophical belief that multiple forms of knowledge exist, in multiple realities of individuals. Methodology now considers how those beliefs can then contribute to an organised and logical scheme that might facilitate the acquisition of knowledge (Patel, 2015). Many consider methodologies to exist on a spectrum of quantitative methodologies to qualitative methodologies (Morgan, 2007).

As described, the philosophical assumptions I make could lend to either 'end' of this spectrum. Quantitative, deductive measures could be used to understand knowledge in a more objective sense; qualitative, inductive measures could be used to understand knowledge from the perspectives of the individuals involved in its construction.

In my original conception and proposal for this doctoral work, considering both of these ends of the spectrum was my plan. I hoped to examine quantitative measure of progressions to understand how Gateway year students compared to standard entry peers, and particularly those who came from similar WP backgrounds. On the opposite end of this spectrum, qualitatively, I would want to know more about the experiences of Gateway students, and possibly staff and faculty, to help to understand how they understood progression in medical education, again in considering their position compared to standard entry peers.

However, as detailed in Chapter 1 with the overview of my results chapters (1.5), it is clear that this plan is not the one that came to fruition. For all the rigorous philosophical considerations and methodological planning, research exists not in a void, but in the 'real-world.' Certain aspects of research are out of the control of the researcher, and research often requires resiliency and creativity to continue it.

In considering the quantitative methodology I planned, this doctoral work was to utilise the UK Medical Education Database (UKMED) of medical school data to follow the aforementioned line of quantitative inquiry. It was hoped this could build on the

work of Curtis and Smith (2020), described in Chapter 4 (4.5.1.4). However, upon successful application, gaining access and doing initial data cleaning of the requested dataset in UKMED, it became clear: the quantitative analysis, as planned, would not be possible at this point, to contribute to this doctoral work. There were not sufficient data at the time to do meaningful analysis comparing progression, beyond the scope of what Curtis and Smith did. Still, this lack of data sufficiency led to a creation of a report that was provided to the UKMED research subgroup, to highlight some key issues and recommendations. This report is included with the appendices of this thesis (Appendix B: UKMED Report).

While the quantitative planned methodology was not feasible, around the same time point, the qualitative methodology work of this thesis was underway, and producing insightful results. As such, it was decided that turning the focus to the more subjective considerations of knowledge around the topic of WP would be of value, and had potential to make key contributions to the field. Thus, the results chapters in this thesis include largely qualitative work, as presented in Chapter 7 and Chapter 9. A 'mixed-methodology' study was included in this doctoral work, to help explore insights of faculty and staff working in a medical school with a specific WP/WA route, detailed in Chapter 8. However, this work still falls more in line with the qualitative spectrums of methodologies; the 'numeric' data are descriptive, using response rates to Likert-style questions. These then are interpreted in conjunction with qualitative open-ended comments in a survey, again, showing more alignment with qualitative methodology as a whole for this thesis. The rationale for this mixed-methods element is detailed in Chapter 8.

6.6   Methods & Sources

The last elements of the paradigmatic building blocks ask researchers to consider what precise procedures and data can be used to acquire knowledge of interest, in line with methodologies. As just described, this doctoral work is very qualitative-leaning. The results chapters present data from semi-structured interviews and predominately qualitative surveys. As mentioned above (6.1), because consideration of methods and sources more directly links to specific research questions and aims, details around interviews and surveys are included in the methods sections of the

respective results chapters. However, in more broadly considering these approaches, the ethical aspects of research are a key factor that should be considered in methodological choices. Thus, this section of the focuses on underlying ethical considerations that underpinned all the research in this thesis.

6.6.1   Ethical Considerations

At its crux, all research should aim to support beneficence (or do good) and be in line with non-malfeasance (or do harm) (Jagsi and Lehmann, 2004). While there are many facets of ethics to be considered (Resnik, 2020), this chapter details four of the basic tenants: informed consent processes, including relationships and power; confidentiality and anonymity; data security; and general balance of benefit versus harm.

Specific details relating to ethics was also considered, and included Ethics applications for each individual study of this thesis. All studies were granted approval by the Hull York Medical School Ethics Committee; details and references for each are provided in specific chapter Methods sections (7.4, 8.4, 9.4).

6.6.1.1   Informed Consent Processes, Relationships, Power

Informed consent ensures that participants in research understand their role, as well as the role of the research team, prior to consenting to participate in research (Ross, 2014). In all projects in this thesis, participants were provided information sheets, detailing the work, the researcher role, their involvement and rights, including withdrawing from the study at any point. In research, it can often be interpreted that the researcher is in a position of 'power' over the participant (Marshall and Batten, 2004). This makes ensuring participants know their rights, and have had opportunity to ask questions, even more important. In the case of semi-structured interviews, in addition to already having written consent, I always presented another opportunity for participants to consent or withdraw, and ask questions, at the start, prior to audio-recording.

In addition to considering baseline assumptions of power dynamics, it was also important to consider where I might have working relationships with any participants, as this could also influence the research relationship. Holding a teaching

assistant role with the Gateway year programme in my medical school, and being a member of the anatomy education community, I could have potentially had working relationships with participants in any of my studies. This is where again, being explicit about my role as researcher, was key for information sheets and other study materials. Additionally, being reflexive in the research process about this proximity, as noted above, is key in promoting the ethical 'trustworthiness' of qualitative research (Stenfors et al., 2020).

6.6.1.2 Confidentiality and Anonymity

Confidentiality, or the privacy and access allotments of data, is another key consideration (Wiles et al., 2006), particularly in qualitative inquiry (Ryen, 2011) when conducting interviews, as was the case in the two qualitative works of this thesis, due to data being audible. As such, for all interviews, private spaces in the medical school were reserved, or interviews were conducted in the privacy of my home, alone, so I could protect confidentiality of my participants as researcher.

Related to privacy is anonymity, or identity protection of participants. In order to ensure anonymity, only necessary characteristics or demographic information were collected from participants. Direct quotes in the presentation of any data were also anonymised, including removing and replacing the following with more generic terms: key region identifiers, names of (higher education) institutions (medical schools), and specific employment or education characteristics. All of this anonymisation was done by myself, as primary researcher and author of this thesis, before ever sharing data with other members of the research team.

6.6.1.3 Data Security

Data security links to elements of confidentiality, ensuring that data is collected and stored in a way that ensures the privacy and protection of such data (Egan-Lee et al., 2011). These points are even more important in considering the research context of this work as it relates to the COVID-19 pandemic, described above (6.2.1.2). For example, there were months where physical copies of data were not accessible to the research team, due to sudden university office closures. Further, much of this doctoral work ultimately involved virtual data collection, meaning that online

security was also of importance for not just storage, but data collection. Good practice and consideration of these points helped to promote ethical research practices. Physical copies of data always kept secure; in shared office spaces, this included in locked storage facilities in rooms where specific and restricted badge access was required. This provided particular sense of security in the aforementioned case of data inaccessibility, due to the pandemic. Further, whenever possible, physical copies were kept anonymised with only participant numbers for key identifiers.

To the point of online security, only university-affiliated platforms were used in recruitment, data collection, and analysis. These included University of York affiliated Google, Qualtrics, and Zoom accounts, and a Hull York Medical School Outlook account. Using these university-affiliated platforms helped to ensure research was conducted in systems with better baseline online security.

6.6.1.4 Benefit Versus Harm

Finally, research proving more benefit than harm is at the base of ethical considerations (DuBois and Antes, 2018). In this doctoral work, while discussing day-to-day and normal educational practices, by nature of the subject matter, sensitive topics could arise (i.e. - financial, economic concerns; academic performance; career progression), resulting in a potential for emotional distress (Ryen, 2011).

Yet these considerations for potential, psychological stressors were minor. Further still, participating in research, particularly being interviewed, can be a point of self-reflection, adding to benefit to participants; there can be merit in being able to share one's story, and having the sense it is valued. Many participants expressed gratitude and interest in the researcher taking time to speak with them or ask their perspectives.

Still, efforts were made to always provide clear contact details for the primary researcher and her primary supervisor, in the instance any participant in any study felt 'harmed' by participation. Protocols to provide follow-up or details for regional support (i.e.- mental health hotlines) were prepared. Additionally, as stated above, it

was made clear to participants that withdrawal from the study at any point was a possibility, should any discomfort arise during the research process.

6.7 Paradigmatic Stance of the Thesis

All of the above paradigmatic elements can be considered in conjunction, and used to identify already established paradigms in the field of research, that align with my approach to work. Clearly communicating which specific paradigms one operates in can ensure best practice in research communication (Varpio and MacLeod, 2020). As such, these established paradigms are briefly addressed in each of the subsequent results chapters, as they may relate to the specific studies. Still, this end of the overarching theoretical chapter will define and describe them in more detail, and frame them as they align to the overarching conceptual framework, defined in Chapter 5.

As a researcher, I sit firmly in a pragmatic paradigm. While debated by some to not be a 'true' paradigm, addressed below, the pragmatist approach to research best captures my multiple perspectives on topics such as ontology, epistemology, and methodology, described above. However, I also recognise that *as an educator and human being,* considering the topics of axiology and reflexivity, I also draw a lot on the paradigm of critical theory. Therefore, my approach to research which is seen across this doctoral work, might ultimately be described as that of a pragmatist with critical theorist leanings.

6.7.1 Pragmatism

Pragmatism is the philosophical tradition or paradigm that focuses on 'usefulness'; it tends to reject the idea that any one paradigm can ultimately lead to truth or true knowledge (Legg and Hookway, 2019). Knowledge is understood via practical outcomes. A core question that pragmatists formulated is around the practical differences of theoretical alignment, whether it really makes any difference if a given theory were 'true' or 'false' (Frey, 2018). Often, there is no such difference or established truth/falsity, and therefore no need to adhere to theory so tightly. Instead, the goal of research should be more focused on establishing shared meanings and action (Morgan, 2007), not focusing on philosophical differences.

Thus, pragmatism does not require commitment to any particular system of philosophy or reality. Because of this, some researchers do not consider it a 'true' paradigm, rather an 'alternate' paradigm (Zaidi and Larsen, 2018). Nevertheless, it is due to this 'sidestepping' of traditional ontology and epistemology that it is easy to see how my above outlined beliefs on ontology and epistemology align with the paradigmatic approach. I interpret reality and knowledge to exist in multiple ways. Moreover, depending on the particular research question or aim, I have no qualms in using different methodological approaches to try to understand knowledge, or in using different theories, testing theory, or even eschewing theory, to generate new models. All of these approaches are demonstrated in this thesis. A pragmatic research approach contests divisive research history, that often polarises quantitative and qualitative work, but instead shows how methodological flexibility, based on problems and solutions, could be the 'best' way forward (Onwuegbuzie and Leech, 2005).

Finally, pragmatism was a history of being well aligned with research that focuses on social justice (Frey, 2018), taking on a more 'political' approach to scientific inquiry (Maxcy, 2003), particularly in the realm of education. John Dewey, one of the more famous philosophical figures in modern education, is also considered one of the classical pragmatist philosophers (Legg and Hookway, 2019). Dewey posited that freedom of inquiry, via pragmatic approaches, should be best practice in understanding transformative educational experiences (Hildebrand, 2018; Morgan, 2014). Following this train of thought presented by Dewey, pragmatism is a natural fit my other paradigmatic influence: critical theory.

6.7.2   Critical Theory

Unlike pragmatism, critical theory is often regarded as one of the major established paradigms in research and science (Varpio and MacLeod, 2020), with a history grounded in the social sciences. Critical theory, in the broader definition of the term as a paradigm, is space and research that focuses on critically examining social structures, to further understanding of intergroup struggles, and the role of such power struggles in the lives of individuals (Paradis et al., 2020). In this broad definition, critical theory encompasses many other theories, such as feminist, queer,

anticolonial, and antiracist theories (Buchanan, 2018). Often, critical theory considers the nature of discourse and language to examine power; it has been applied in this way to further understanding of medical discourse, and the doctor-patient relationship (Waitzkin, 1989). Further, critical theory has potential to provide new theoretical perspective to medical education, including considering differential attainment and its social environment influences (Sandars, 2016). And critical theories have been used in medical education in more recent years to further understand the challenges particular groups face in a variety of ways (Hodges, 2014), including the use of feminist theory to understand gendered issues (Sharma, 2019), and post-colonial theory to re-examine professional identity formation research, from the perspective of minoritized doctors (Wyatt et al., 2021a).

Much of the focus of critical theory is around the idea of 'human emancipation' from the oppression that exists in many social arenas (Bohman, 2021). Critical theory posits that its encompassing theories and general work should be explanatory of what might be 'wrong' in social circles from an equality angle. But this work should also aim to be practical, in identifying goals that can then lead to social transformation. This practical element is what deepens the link between pragmatist and critical theorist positions. However, unlike pragmatism, critical theory does ascribe specified ontological and epistemological viewpoints. It assumes that reality is socially constructed, and that knowledge is also influenced by the social restraints of those inquiring (Paradis et al., 2020). As such, in research, critical theorists favour inductive approaches to research that are often aligned with qualitative inquiry. In these paradigmatic descriptions, the link to my aforementioned philosophical positions is clear. Particularly in my ontological positions, I recognise the role of social constraints in our understanding of 'reality.'

And not only does the philosophical approach to this doctoral work align with the field of critical theory, elements of critical theory sit at the heart of its focus. While perhaps not focused explicitly on ideas of oppression and emancipation, the focus certainly aligns with specific aspects of critical theory, such as critical enlightenment (Kincheloe and McLaren, 2011), or an examination of competing power interests to better understand the role of privilege in society. Economic privilege, who has it, and

perhaps more importantly who does not, is key to the underlying aims of WP mechanisms in UK medical education.

6.7.3   Critical Reflection on my Paradigms

While my paradigmatic stances are well-aligned with my beliefs, actions, and considerations in the realms of paradigmatic building blocks, it is important to note here both the use of these paradigms, and their limitations.

First, it might perhaps be a bit unusual to use a combination of paradigmatic approaches in one cohesive work, such as this thesis. Therefore, it is important to be critical and reflexive in how these two paradigms are being used, particularly in how they frame the three studies that make up this work. I consider pragmatism to my guiding paradigm and worldview for essentially all research I do; I ascribe to pluralistic nature, the problem-centeredness, and ultimately the real-world practice implications it requires (Creswell and Creswell, 2017). Because of this, each study of this doctoral work first considers the practical implications of the research, focusing on how to improve best-practice in three areas of WP, from a multitude of perspectives. However, in considering the specific research aims, and the nature of this doctoral work, I recognise that critical theory is an influential part of portions of this work. The nature of WP research is political, and makes concessions for examining power and justice, which aligns with critical theory thought. As such, lines of inquiry around these topics are included in some facets of this doctoral work. Most prominently, when speaking to students about their progression experiences (Chapter 9), critical theory is a dominant influence. Students are asked to reflect not merely on the program experiences, aligning with pragmatism, but on their sense of otherness and views on stigmatisation, which is influenced by critical theory and the theoretical framework for that study. While the other two studies ask participants to comment on widening participation, more generally relating to critical theory, it is not as explicitly the focus of the work, as is the case with Chapter 9. Therefore, critically reflecting on my paradigms to the entirety of this doctoral work, it is important to state here that this thesis is a pragmatic examination, with selective critical theory threads.

Now, to be critical of these selected paradigms, beyond my use of them. Of the potential 'pitfalls' of these paradigms, there are two major critiques I will note here: the 'a-philosophical' nature of pragmatism, and the 'radical' elements of critical theory. First, in the field of philosophy, there are those that do not consider pragmatism to be a 'true' paradigm, as noted above. This noted 'side-stepping' of larger philosophical questions is critiqued as potentially contributing to inconsistency in research values. Particularly, pragmatism for the sake of an easy paradigmatic alignments moves away from the heart of this philosophical theory – to conduct research as a 'social endeavour' considering betterment of social circles as a goal (Biddle and Schafft, 2015). Furthermore, there can be lack of clear communication on what exactly 'betterment' means, and which social circles are benefitted. However, while this critique may be well-substantiated for many research projects reporting pragmatism as a guiding influence, in the context of this doctoral work, level of detail aims to address this. The individuals who potentially can be bettered by critical examination are identified first and foremost as students WP supports, but also the field of medical education, and hopefully the profession and patients. Furthermore, the critique of pragmatism and its focus on usefulness over philosophical principles does not stop it from being a useful worldview. As Rosenthal and Thayer (2011) aptly conclude, "pragmatism has become vitally implicated in the practices of current intellectual life; in the light of this fact, a more pragmatic justification of pragmatism is difficult to imagine" (Rostenthal and Thayer, 2011: Evaluation of pragmatism section).

As for critical theory, and in particular critical theory when used in an educational settings, it is the position of some that it can be radicalised, and sometimes be so narrow that it ultimately acts as oppressive and restrictive (Allen-Brown and Nichols, 2004), despite this being against the core tenants of the broad understanding of its philosophy. This is certainly important to be mindful of. However, this work employs a broader sense and influence of what critical theory is, recognising the complexity of diversity, inclusion, and intersectionality as subjects, beyond the scope of this work. As such, the hope is that the critical theory here will be used not to overly

narrow ideas, but rather as an influence or lens to interpret findings, and guide directions of research (Varpio et al., 2019).

6.8   Chapter Summary

This chapter detailed the underlying philosophical principles and overarching methodology for this thesis. With understanding now established about the nature of this doctoral work, in the background Chapters 2-4, the conceptual model and aims detailed in Chapter 5, and in this chapter's presentation about the theoretical approach to the work, we can now move to the actual studies, the work itself. The following three chapters will each present a component of this thesis work, referencing in their methods the methodology and theoretical underpinnings described here. As described in the introduction, these studies link to broader WP elements, outreach, selection, and progression, and begin with an examination of anatomy outreach, as understood by its facilitators.

Chapter 7:   The Role of Anatomy Outreach in Widening Participation – A Facilitator Framework

7.1   Chapter Introduction

As explained briefly in the introductory chapter (1.6), the work described in this chapter occurred chronologically last in the thesis timeline. The idea arose from student perspectives on the value of anatomy education as a form of academic capital, and important feature of Gateway years, as will be described in Chapter 9.

However, it is presented here as the first 'results' chapter because the mechanism and experiences described are the 'broadest' form of WP investigated in this thesis. Additionally, in considering the 'journey' of students from WP backgrounds who may eventually matriculate via a Gateway year- a large focus of this thesis- outreach can be a key form of recruitment to apply to medicine.

With brief re-reference to my reflexivity (6.2.2.1), I have a vested interest in anatomy education and outreach. Due to this position in the field, I am also aware of how common anatomy outreach is in promoting aspirations to health sciences and medical education. However, while there are numerous reports on the function of anatomy-related outreach programmes, these are largely descriptive. There is a paucity of research on why these programmes exist, the function they are believed to serve, and how organizers conceptualise their involvement in this type of outreach work, particularly as it relates to WP.

Thus, this chapter explores these perspectives, from the view of anatomists who facilitate such outreach, then presents a conceptual model to represent their understanding. The WP aspect of the work is explored in the most detail, but there are other elements presented, as a result of the methodology and its grounding in participant data. These include broader views on public engagement, beyond WP or educational outreach, as well as some perspectives on how the current climate of the world and the coronavirus pandemic may impact this work.

7.2   Background

Anatomy has long been regarded as a 'cornerstone' of medicine (Sugand et al., 2010; Turney, 2007) and health professions (McLachlan and Patten, 2006). It is not only

regarded as one of the key areas of basic content that must be mastered in health sciences, but in more recent years, anatomy has also been recognized for the psychosocial learning the subject can offer early in health professions education (Dueñas et al., 2020b). The 'first experiences' of anatomy, particularly working with cadaveric materials, can be a very powerful learning experience (Kissler et al., 2016).

But this presence and value does not just apply to higher/medical education; anatomy is a prominent component of many forms of health sciences outreach, designed to share the topic beyond the realms of secondary and post-secondary education (Taylor, 2020). Outreach is generally defined as academic institutions providing access or service to communities outside the academy (Johnson et al., 2019). This may include educational outreach, such as providing anatomy education to the public in some capacity. The phenomena of *how* anatomy is integrated into many forms of outreach is well described; many examples of anatomy-related outreach can be identified in the literature. Examining this literature helps in framing understanding of how common anatomy outreach is, but also how heterogenous the structure of anatomy outreach is.

7.2.1 Review of Anatomy in Medicine-Related Outreach

7.2.1.1 Anatomy and Physiology-Focused Outreach

Some outreach programs are dedicated entirely to anatomy content. Hubbard et al. (2005) describe their program in Illinois, designed to offer a short course in anatomy for high school (late secondary school, ages 14-18) students and teachers. With support from an educational outreach grant from the American Association of Anatomists, the course offered a one to two day visit to campus facilities, working though anatomy-related stations including those with cadaveric specimens. Meyer et al. (2018) present a similar program in Mississippi, where they host undergraduate students in addition to high school students for activities in their gross anatomy laboratory (lab). Their description highlights benefits to not just the student participants, but the outreach facilitators. They also highlight the potential for anatomy to support particular state and community needs; anatomy outreach might improve interest in health sciences, or health literacy. Health links are seen prominently in some anatomy-focussed programmes; Zhang et al. (2016) expand on

anatomy focus with pathology in their outreach. This Pennsylvania based program, though, is still designed for high school students, offering the opportunity for a dissection lab visit. The goals of their program are to not just provide an interactive anatomy experience, but also inspire career aspirations for the health sciences. The focus on career and educational promotion is described as an integrated part of other anatomy-focused outreach; Buthmann et al. (2018) highlight how 'demystifying' health care professions is an important element of their Ottawa-based outreach that features a cadaveric anatomy laboratory visit.

Anatomy outreach programs can also vary in target audiences, beyond high school students. Kumar et al. (2020) describe a program focused on the human body, including activities that facilitated use of an Anatomage (virtual dissection) table and anatomy models, for children primarily under the age of 10. Ortug et al. (2020) created an outreach program within a museum and anatomy laboratory that included activities such as playdough modelling, use of plastic models, and anatomy puzzles. Participants in their activities included students as young as preschool and kindergarten age, up through high school. Other anatomy outreach focuses on older populations; in addition to high school students, the anatomy lab tour program described by Wines (2019) includes 'allied health' or 'adult' learners. In numerous papers, Burns describes a large anatomy outreach program that targets not learners, but other educators (Burns, 2002; Burns, 2008). The program aims to provide anatomical education for professional development of K-12 biology or health teachers. This program offers a wide variety of mini-courses for teachers, many of which include strong anatomical focus, including embryology, neuroanatomy, and numerous system-focused and organ-focused gross anatomical topics. A similar programme, designed for educators, not students, is observed in Mississippi (Notebaert et al., 2018), although it has faced challenges due to the COVID-19 pandemic (Gordy et al., 2021). These categories of outreach align with many of the medical education categories of outreach, as described in Chapter 4 (4.3).

Other outreach programs described in the literature feature anatomy as less of a primary focus, but still an important accompaniment to the sister subject of physiology. A Nebraskan physiology outreach program for grade 6-8 students

includes introduction to anatomy topics and animal dissections prior to completing active physiology tasks (Clarke et al., 2019). In Kentucky, an outreach program to provide experiences to underserved K-12 schools include anatomy as part of their larger, largely physiology-focused curriculum (Metz et al., 2018).

7.2.1.2 Anatomy within Health Sciences Outreach

Anatomy is often also a feature of more generic health sciences outreach programs. Anatomy content, including animal organ dissections and human specimen observations, is described as a component of a summer, health sciences learning experience for middle school-level students at a different Nebraska institution (Houtz and Quinn, 2006). In a different Pennsylvania program, medical students run a semester-long, problem-based learning (PBL)-style course for high school students that focuses on recruitment of underrepresented minority students to higher education (Karpa et al., 2015). Anatomy is included, as well as numerous other basic science topics, and activities include histology laboratory session, and a gross anatomy dissection session. The program models elements of medical school curriculum, like many other 'pipeline' or 'mini-med school' branded programs do (Henderson et al., 2015; Afghani et al., 2013; Banuelos and Afghani, 2016; Azzi et al., 2019; Ta, 2019). These types of mini-med school programs frequently cite anatomy as a component of their curricula, linking back to the aforementioned importance of anatomy as a cornerstone of medicine and other health sciences. These types of programmes may be comparable to the UK Pathways to Medicine (see section 4.3.2); although the Pathways programmes do not specifically highlight anatomy as one of its focus subjects, it may be a small, featured component.

Many of these mini-med school programs, like other more anatomy-focused outreach described above, can have a focus on engaging with underserved communities (Henderson et al., 2015) or increasing participation in higher and health professions education for students from traditionally unrepresented backgrounds (Banuelos and Afghani, 2016). These programs do so by providing unique educational opportunities to students from underrepresented backgrounds, and often include mentorship elements and formal or informal university application advice (Azzi et al., 2019). This aligns with the concept of widening participation (WP),

although not a term used in some countries to describe the policy and programs aimed at attempted to increase the number of underrepresented students who apply to and 'participate' in higher education. It is also worth noting that WP, the focus of this thesis, is more prominently a UK (and Australian) used term, although 'outreach' can be considered an action of WP, as described in Chapter 2 (2.3.1.2). Yet, within the present reviewed literature, there were far fewer examples of publications relating to anatomy outreach specifically, or integrated, in the UK-setting. Most articles were North-American centric. This does not necessarily imply that anatomy is not an outreach component of WP-activities in the UK and beyond; the anecdotal experiences of the author, and her primary supervisor, of this work suggests otherwise. However, it may be that WP-related outreach in this field is written more in the context of medical education (Murphy and Glenny, 2018), and does not include details of specifics, like anatomy activities. Medical school outreach, such summer schools and open days (White, 2016), may very well include anatomy aspects, not documented in published literature, as suggested above for Pathways programmes.

Finally, widening participation, and the mechanisms it encompasses in the UK setting, are explored extensively in Chapter 4, but it is important here to re-address a specific distinction. While used interchangeably by some, outreach is a distinct term from widening participation; outreach can be a type of WP (McLachlan, 2005), it is not the only form, and need not always be educational, as the next section demonstrates.

7.2.1.3   Anatomy Outreach Beyond Educational Outreach – 'SciComm'

Indeed, anatomy outreach beyond education is also described in the literature. Taylor et al. (2018) describe how anatomy outreach can take the form of more generic public engagement, or sharing of higher education knowledge (in this case, anatomy) with the public. The authors describe their work as part of a "Campus in the City" event in the United Kingdom, where the general public was invited to learn more about the human body, and explore anatomy using 3D software. The study showed the public's interest in anatomy, while highlighting the varied existing anatomical knowledge they may hold. This work shows the potential for anatomy

outreach beyond education. This is also highlighted in many forms of science communication (SciComm) that anatomists contribute to. Again, these forms of outreach have a more generic or wider potential audience than the educational outreach described above (Chapman, 2019). While SciComm can take many forms, documented examples of anatomy SciComm include blog posts about how the science fiction topic of zombies can be used to educate the public about neuroanatomy (Philp, 2019), or how orthodontics can be a segue into a lesson on comparative anatomy and evolutionary biology (Organ and Ungar, 2017). There are numerous examples of using superheroes to communicate elements of anatomy, and again, physiology (Zehr, 2014; Fitzgerald, 2018). SciComm may also include other media forms, such as radio or television segments on anatomy (Hebert, 2007). These more 'unique' takes, or engagement in popular culture, are ways individuals can relate their anatomy outreach to a wider audience.

7.2.2   Critique of Current Anatomy Outreach Understanding

The above sections establish that anatomy is a frequently used practice to engage individuals, particularly in educational outreach, but also more generally in SciComm. However, most of these pieces are largely descriptive. They frequently establish the 'problem' or deficit in access to higher education; typically, this is associated with areas of low health literacy or low participation in higher education, associated with lack of access to resources. By providing anatomy education, outreachers hope to improve the specific educational needs of their local communities. Some of the studies provide basic descriptive or evaluation data as evidence of the 'success' in such outreach, but frequently in the form of basic satisfaction with events. What is notably missing in the literature is shared understanding of what the act of anatomy outreach generally has to offer. The state of current literature focuses on the 'what' of anatomy-related outreach, and not necessarily this generalizable 'why' or 'how' of anatomy outreach. There exists no shared understanding or model of what exactly anatomy outreach tries to achieve, and how outreachers believe it accomplishes such goals.

7.3   Research Aims & Questions

Thus, this study aimed to elevate the comprehension of anatomy outreach as a social phenomenon, by exploring views on its function and purpose within the anatomy education community, and beyond. It aimed to answer the following research questions:

- Does anatomy add anything 'special' to health sciences outreach?

- How do facilitators understand the purpose of anatomy outreach in supporting diversification and widening participation to medicine and health sciences education?

- What mechanisms best support, or challenge, the ability of academics to conduct anatomy outreach?

- Are there specific drivers that lead individuals to commit to outreach as service work?

- Given the current educational climate (due to the coronavirus pandemic), how has COVID-19 affected anatomy outreach?

By exploring personal experiences and perceived ethos of anatomy outreach, from facilitator perspectives, this work aimed to provide a generalizable and conceptual model of anatomy outreach. Ideally, such a conceptual model would contribute to deeper understanding of anatomy outreach, its purpose, and its potential. Within the specific scope of this thesis, this depth in understanding may also help provide a new perspective on outreach as a key mechanism of WP, aligning with the overarching aim: explore generalisable views on outreach, and its role in supporting widening participation (indicated in Chapter 5, section 5.3).

7.4   Methods

This study was approved by the Hull York Medical School Ethics Committee (reference # 20 37).

7.4.1   Theoretical Orientation & Overarching Methodology

Given the aims of this work, and the large paucity of research in this specific topic, with the inception of this study, many methodologies were considered within the realm of qualitative research as potential appropriate investigations. While the

research aims require participants to reflect on the personal experiences in facilitating anatomy outreach, the outreach itself is more the focus of the research, eliminating a phenomenological approach (Braun and Clarke, 2013). Ethnography, particularly a focused ethnography (Andreassen et al., 2020), was then considered as a methodology more appropriate for investigation of social phenomena, which could encompass outreach. However, ethnography requires more consideration for specific cultural influences and interactions (Atkinson and Pugsley, 2005), which again seemed inappropriate for the broader goals of this work. Ultimately, given the broad disciplinary interest and goal of better explaining the phenomena of anatomy outreach itself, grounded theory (GT) was determined to be a suitable methodological approach for the present work (Lingard et al., 2008; Chun Tie et al., 2019).

More specifically, this work draws on the constructivist (Charmaz and Belgrave, 2015) and 'lite' (Braun and Clarke, 2013) forms of GT, rather than the traditional or evolved forms (Taylor and Francis, 2013; Glaser and Strauss, 1967). Generated at a point in time when researchers were attempting to add rigour to the field of qualitative inquiry, GT in its more traditional form was first established in the 1960s (Glaser and Strauss, 1967). This qualitative methodology was described as more scientifically 'rigorous' due to its argument that results were truly 'grounded' in qualitative data collected, and far less informed by the researchers interpretation (Tavakol et al., 2006). This approach traditionally required researchers to take a more 'blank slate' approach to approaching research topic – building the topic/theory from the ground up.

Eventually, one of the authors of traditional GT, diverged and ultimately created a newer form of GT, 'evolved' GT (Strauss and Corbin, 1994; Chun Tie et al., 2019). This evolved GT went beyond the traditional stipulations of original GT to consider with more depth the symbolic meaning that individuals can apply to social phenomena, drawing on the views of social interactionism (Chun Tie et al., 2019). With this divergence, GT started to transform from a more atheoretical approach, to one that recognizes the role other theoretical and individual positions may have in the interpretation of data.

This perhaps is what paved the way for other 'genres' of GT, included the one employed in the present work: constructivist grounded theory. As Charmaz, the primary creator of constructivist grounded theory, describes her own work and the distinction from previous forms:

> *"Constructivist grounded theory (1) gives priority to the studied phenomenon rather than techniques of studying it; (2) takes reflexivity and research relationships into account; (3) assumes that both data and analyses are social constructions; (4) studies how participants create meanings and actions; (5) seeks an insider's view to the extent possible; and (6) acknowledges that analyses are contextually situated in time, place, culture, and situation."*
> *(Charmaz and Belgrave, 2015: 3-4)*

These considerations not only apply well to the present research aims, but align with the overall theoretical underpinnings of this thesis, as described in Chapter 6. And of note, pragmatism, one of the guiding paradigms of this doctoral work, has also long been an influential theoretical perspective in, and lends well to, GT inquiry (Strübing, 2007).

In reviewing the points made by Charmaz and Belgrave (2015) in the above passage, both the approach and aims of the work aligned well with each of these elements. While transparent techniques are detailed below, focusing on views of the phenomena took priority, particularly in discussing points around theoretical sensitivity. Reflexivity, which was broadly addressed in Chapter 6 (6.2.2), is more directly explored for this current anatomy-related work, below. And finally, the allowance for considering time, place, culture, and situation were a particular important element, given that this work was conducted during a global pandemic. The impact specifically of COVID-19 in the present data collection, is also described in detail below.

Still, while constructivist GT makes more allowance for the researchers and social construction aspects of qualitative work that the traditional forms, as with any qualitative or other research project, transparency in methods should be a key

feature in communication. Therefore, Figure 5, on the next page, presents an overview of a framework for GT methods and processes, modified to detail the specific steps of the present work. Details for each element of this methodological framework are described below.

7.4.2   Participants

Purposive sampling (Etikan et al., 2016) was initially performed to recruit anatomists with any type of outreach experience, past or present. This was the primary inclusion criteria. Recruitment materials were disseminated via social media and professional platforms; this included Twitter, and AnatomyConnected, a web forum space for the American Association of Anatomy, which has large international membership. Following in GT practices, continuous data collection and coding was performed, informing theoretical sampling that resulted in more targeted recruitment via email, as well as another broad purposive call via social media.

Interested individuals were asked to complete a survey to provide informed consent to participate, basic demographics about position and location, brief background on their anatomy outreach experiences, and contact details (email). Participants who completed the survey were then contacted to set up a participation date/time for data collection. A copy of this survey is included in the appendices (Appendix C: Anatomy Outreach Initial Participant Survey).

7.4.3   Data Collection

GT does not require any specific means of data collection. Semi-structured interviews were selected, to allow for in-depth conversations and data collection from participants, so they could discuss in detail their experiences in facilitating anatomy outreach. Such qualitative interviews can be key in understanding how phenomena are experienced or perceived by participants (McGrath et al., 2019); given the present study focus, and the novel element, individual explorations as a first line of inquiry was determined to be the best qualitative method for this work.

Figure 5: Grounded Theory Framework of Methods
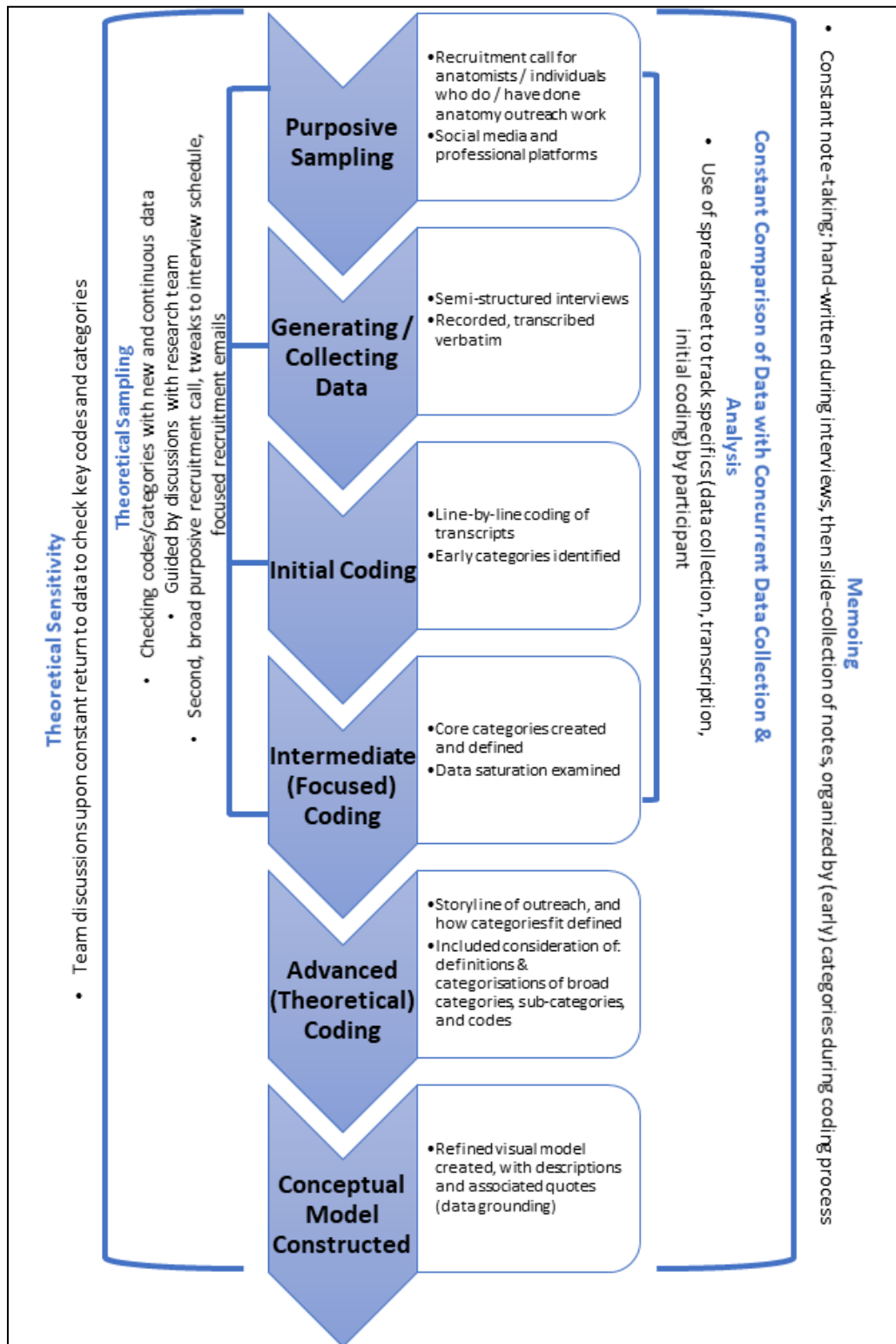
Figure 5: A sample framework for GT methods and processes, modified from a framework presented by Chun Tie et al. (2019). Here, the details of each element are specific to the details of the present study.

An interview schedule was created, based on the research team experiences with anatomy outreach (Table 3), but the semi-structured nature allowed participants and the interviewer to freely discuss topics. Further, following in the iterative nature of GT, the interview schedule was revisited and revised as needed with each interview and cycles of coding.

Table 3: Sample Interview Schedule for Anatomy Outreach Work

Interview Stems
• Please describe/elaborate on your anatomy outreach programme experience(s)? (Follow up to survey comments)
• What are the goals of this / these particular programmes? (In brief) o Are these explicit goals, or goals as you define them? o Are there specific knowledge / skills you hope the programme imparts?
• What does anatomy, as a subject, specifically add to this outreach / its goals? o What perspectives does anatomy offer, compared to other fields / professions?
• What actions / resources are required to successfully conduct anatomy outreach? • Are there any drawbacks / issues you have faced in facilitated anatomy outreach? • Do you appraise your anatomy outreach work? If so, how? o Can you measure the value / success of anatomy outreach? If so, how? o If no appraisal, what do you think the best way to approach this would be?
• An element of our research interests is widening participation (WP), or enacting programmes to support traditionally underrepresented individuals in pursuing / applying to higher education. Does any of your outreach work fall into this category? If so: o How does your anatomy outreach work relate to WP? o Are there any specific goals / knowledge / skills you incorporate for WP anatomy outreach?
• What attributes / values / beliefs do you personally hold that align to doing outreach? o Are these more personal or professionally linked? And why? o Are these traits / values shared by the larger anatomy community? And why?
Coronavirus Pandemic Stems
• In the midst of a pandemic, can you reflect on how this has impacted anatomy outreach specifically? o Do you think there are any implications of these changes? If so, what? o What are your views on the future of anatomy outreach, given the pandemic?

It is also important to note that this research was conducted during the midst of the coronavirus pandemic (COVID-19) in the latter half of 2020, although the project commenced prior to the start of the pandemic. While this did not affect the data collection or analysis, it did result in the addition of a line of pandemic-related questions to the interview scheduled. During the pandemic, many 'normal' outreach activities were halted; anatomists were asked to discuss their views on how the pandemic had affected their specific outreach.

All data were collected by the author of this doctoral work; interviews were conducted virtually on Zoom, digitally recorded, and transcribed verbatim. Interviews were approximately 30 to 45 minutes in length. During the transcription process, all data were sufficiently anonymised to prevent identification, including removal of location-specific details and names of outreach programs that were institution-specific.

7.4.4   Data Analysis

Following the GT methodology, initial, line-by-line coding was done continuously throughout the data collection process by the primary researcher of this doctoral work. While this was an iterative process with data collection, following in the requirements of GT methodology (Watling and Lingard, 2012), details on coding and subsequent analysis are presented here. Early and core categories were formed, and discussions amongst the research team determined when theoretical sensitivity was reached. This research team included the primary author of this work, and her supervision team. Codes and categories were then organized into broader categorizations, and a story-line established (Watling and Lingard, 2012). Finally, a refined visual model was constructed to depict the elements of the Anatomy Outreach Conceptual Model, and descriptions and associated illustrative quotes organized into a codebook, for data 'grounding' (Chun Tie et al., 2019).

As mentioned above, there was the addition of the coronavirus-related questions to the interview schedule given the climate when the research was conducted. While important and insightful, these data differed from the original aims of the work. Thus, these components of interviews were analysed separately, as an element related to and affecting the conceptual model, but not a permanent component. Pandemic-related categories are presented as a 'disruption' to the model.

7.4.5   Specific Reflexivity & Paradigmatic Positions

In any research, but particularly qualitative work, it is important for researchers to reflect on their underlying paradigms and be reflexive in undertaking the work (Brown and Dueñas, 2019). Being transparent about this reflexivity is even more important given the present use of constructivist GT, and its theoretical assumptions

compared to the more objective forms, as explored above (Charmaz and Belgrave, 2015).

As primary researcher, it is important to consider my educational background in relation to this particular work. My "research relationship" (Charmaz and Belgrave, 2015) to this work is intimate. My background is in anatomy education; I have volunteered myself to facilitate a variety of anatomy outreach activities. These experiences cannot be extricated from my interpretation of this research; I do believe that this type of outreach does hold some kind of value, otherwise I would not have formerly been involved with it. Furthermore, I continue to be committed to the idea of outreach in the field of anatomy. As a volunteer committee member of the Diversity, Equity, and Inclusion Committee of the American Association for Anatomy, my recent committee focus is on outreach. Still, I have tried to ground ascription of value in this study to what has been expressed by participants, particularly by relying on initial line by line coding as the starting place for all analysis, as described above.

7.5   Results

7.5.1   Participant Characteristics

A total of 18 participants completed interviews, from a range of educational levels and locations (Table 4).

Table 4: Participant Characteristics of Anatomy Outreach Work (N = 18)

Demographic	Number of participants (n)
Academic Position	
Academic Specialist / Staff	1
Graduate Student	4
Instructor / Faculty	2
Assistant Professor / Lecturer	5
Associate Professor / Senior Lecturer	4
Academic Leadership	2
Country of Employment	
Australia	1
Canada	1
Nigeria	1
United Kingdom (England)	7
United States	8

7.5.2 Qualitative Results – Categories and Illustrative Quotes

A total of 10 broad categories were identified in the data as being part of the phenomena of anatomy outreach facilitation: types of outreach, specific activities (of outreach), goals of outreach, subject benefit (why anatomy?), enablers, challenges, appraisal, motivators / drivers, and community perspectives from the immediate anatomy community and wider field (Science, Technology, Engineering, and Mathematics (STEM) and health professions education (HPE)). Implications of COVID-19 was an additional category. These are each presented in detail in sections below, including illustrative quotes. This results section then concludes in a presentation of the conceptual model generated from the GT process.

7.5.2.1 Types of Outreach

When asked generally to describe outreach facilitation experiences, there were a variety of types and roles, including: Anatomy Nights, broad science events, direct educational outreach (in schools, at universities), formal/national outreach schemes, higher education interdisciplinary outreach, mentorship programs, outreach for teachers/classrooms, public engagement, university-coordinated events, and 'unique public engagement.' These were categorised into broader fields of outreach for anatomists: widening participation (WP) events, broad educational, and public engagement (or 'SciComm', science communication) events. Table 5, on the next page, details these fields, including the outreach types coded into them, and brief descriptions, as an overview.

Each of these identified types of outreach were designed to target specific groups. For widening participation outreach, the groups are underrepresented and underserved populations, who may not have equitable educational access. Some of these shared aspects of being part of national or regional outreach schemes:

> *"Right through to more, I guess is nationalized the right word. But, you know, the sort of more common Teddy Bear hospital initiatives and the university endorsed widening access, widening participation schemes where we had target schools that were definitely selected" – Participant 1*

Table 5: Types of Outreach Organised by General Field / Scope

Fields	Outreach Type	Description
Widening Participation Outreach	Educational Outreach (at underserved schools)	Activities designed for children/youth, where anatomists go out to schools, bringing resources and activities. To be classed as 'WP' these need to specifically target underserved schools.
	Educational Outreach (at university for underrepresented groups)	Activities designed for children/youth, where groups are brought to the university, often to the anatomy lab, or medical school. To be classed as 'WP' these need to specifically target bringing in underrepresented groups.
	Formal / National External Schemes	Events or schemes that happen at a regional, state, country, or international-level that anatomists will support. These programs tend to have strong link to widening participation.
	Mentorship Programs	One-off or more longitudinal programs to provide role modelling and mentorship insights, such as co-ops, paid work, or pipeline program speakers. These opportunities cater more to WP target groups.
Educational (Broad) Outreach	Educational Outreach (at schools)	Activities designed for children/youth, where anatomists go out to schools, bringing resources and activities. These activities tend to be targeted at younger children (elementary school; primary school).
	Educational Outreach (at university)	Activities designed for children/youth, where groups are brought to the university, often to the anatomy lab, medical school. These activities tend to be targeted at older children (middle/high school; secondary school).
	Higher Education Interdisciplinary Work	Bringing higher education groups to anatomy labs, often as an interdisciplinary/supplemental experience. This could include allied health programs, or those in the arts/humanities.
	Outreach for Teachers / Classrooms	Programs designed to support teachers by adding supplements to existing curriculum. Differ subtly from education outreach (in schools) via contact and design (co-creation of activities with teachers). This also includes digital offerings like Skype a Scientist or teleconference events.
	University Events	Anatomists participate at annual/regular university events, where anatomy is just one booth/session.
	Anatomy Nights	Anatomy Nights is a well-established, international network of anatomy outreach. Many participants commented on being part of key leadership, local head leads, and/or anatomist volunteers.
Public Engagement and 'SciComm' Outreach	Broad Science Events	Participating in a booth/session of a large-scale science events, including science festivals, for the general public, families, or children in local communities.
	Public Engagement	Activities designed to engage the public in discussions of anatomy, health, body donation. This could be in the form of targeted community outreach, healthcare collaborations, or the creation of resources like websites/books.
	"Unique" Public Engagement	These are activities that are "unique" and might be regarded as unconventional forms of public engagement. Examples included cocktail and science events, fashion shows, an 'outreach' bus, radio segments, book clubs, and art showcases.

Broad educational outreach, while sharing elements with WP events, did not have specific targets of underserved educational groups, rather were designed to just offer additional educational experiences all pre-higher education groups. These events could take place at schools, third party locations, or the university site:

> *"When we've gone to the schools, when I've been at schools, that tends to be more primary. So infant junior sort of age. And before I started, we went up to a couple of secondary schools. But our secondary school provisions tends to be having them come to us rather than us going to them." – Participant 16*

> *"I have had a booth at, what was it for, I think it's called career track. For [local district] Public Schools. And there were just a bunch of booths and like firefighters, we were, we were definitely [laughs] the interesting booth." – Participant 13*

Lastly, the public engagement or 'SciComm' events were most broad in their target population just being the general public. These outreach types included events such as science festivals, cocktail/drinks and science events, book clubs, and even radio segments:

> *"we've been doing things with the with the science festival, I reckon, for about three years. And so usually we would kind of make a theme of what we want to cover in a different event. And we've been trying to kind of change the theme to kind of go around the different areas of the body." – Participant 11*

> *"…radio, I do have kind of irregularly and sometimes… I do like a science segment, which they have on like a Monday afternoon where I'll usually not a journal article, but I'll pick something that's kind of topical in the news…" – Participant 10*

Of these numerous types of outreach, Anatomy Nights was the only type unique in its branding and structure being reliant on anatomical topics. Anatomy was described as a means of facilitating other types of outreach, whereas for Anatomy

Nights, actual anatomical information was 'centre-stage' as the focus and reason for doing the outreach to engage the public. Anatomy Nights is a well-established, international network of anatomy outreach. Many participants commented on being part of key leadership, local head leads, and/or anatomist volunteers. As one participant described this type of outreach:

> *"[For Anatomy Nights] I'm just the local head as opposed to the [outreach name] that I run by myself… as you know, [Anatomy Nights] started in the U.K. There was a call out on Twitter a few years ago about people who might be interested in expanding. I've been watching it since I saw it several years ago. And so we became one of the first places in North America to do it… So I think we've done three Valentine's Day programs now and we have done two Halloween programs, I think… we've done several anatomy night programs now with a local pub and animal dissection of organs or dissections of animal organs, along with a few more publicly oriented anatomy mini lectures on the heart or the brain for Halloween." – Participant 7*

7.5.2.2 Specific Outreach Activities and Methods

Just as there was variety in the types of outreach described, anatomists had numerous activities they designed and used in their outreach initiatives, including: anatomy activities/stations/circuits, animal organ dissections, art-linked activities (body painting, clay-modelling, paper crafts), cadaver lab visits, career / role-modelling activities, comparative anatomy features, conversational elements, mini lectures, use of anatomy-related props, and virtual engagements. Having a variety of anatomy-related activities to accommodate larger group sizes was common, in the form of circuits or stations:

> *"…we would bring them up to the cadaver lab. And from there we would usually have three stations of activities… And so we would have one room that was more bone related activities and health assessments. So they would learn how to calculate their blood*

> *sugar. They would take blood pressure, calculate BMI, things like*
>
> *that. The next station would be more isolated specimens… And then*
>
> *the last station would be a, what is it, a full cadaver that was*
>
> *dissected." – Participant 3*

The previous quote also highlights how cadaver lab visits, particularly for participants in North America, were a unique feature of outreach that allowed individuals to see donors and specimens in a controlled environment, to facilitate specific outreach goals:

> *"We do teach a lot about health along the way. So, like, we'll show*
>
> *them lungs of someone who had emphysema and probably smoked*
>
> *versus. Healthy lungs, and that gets them to think about their*
>
> *lifestyle" – Participant 12*

Still, not all anatomy outreach activities require cadaveric materials. Some participants clearly described only using animal organs:

> *"I don't use any sort of cadaveric materials, no human tissue*
>
> *involved. It's all either animal tissue or human anatomy described*
>
> *in a way that doesn't depend on the use of material donated to us."*
>
> *– Participant 10*

Others relied on art-based approaches, such as body-painting, particularly in engaging the wider public:

> *"So I've worked with artists on different projects about where is the*
>
> *fine line between art and science and how do you communicate*
>
> *that with the general public" – Participant 1*

Additionally, there were a number of anatomists with evolutionary and comparative anatomy backgrounds, who drew on these specific topics to engage the public:

> *"I think they see it as a museum exhibit, but they can actually sort*
>
> *of get hands on with it, they can touch it and they can move things*
>
> *around. They can really sort of feel what bones feel like. They get*

very excited. We take a giraffe skull and they sort of look it.
Obviously, it's huge and looks a bit strange compared to everything
else, and they go, is that a dinosaur, that's amazing you've got
dinosaur skulls. So they do get very excited." – Participant 16

The interactional and active component was a common theme throughout, that could include elements of career / role-modelling, or just conversational elements, as activities:

"We get them doing like hands on interactive activities with
anatomy models, with actual human brains. They're wearing lab
coats and lab goggles. And we really like the idea of them putting
on the lab coat and looking at themselves in the mirror, taking
pictures and saying like, oh, I look good in this coat." – Participant 5

"We're just sort of there as a chat more than anything, and then we
just discuss how they feel about going to university. Do they have
any intention of going to university? What course would they
study? Do they have any questions? Then they tend to just then
focus on the. How much teaching do we get? Is it fun living in
[university city] or that sort of more, recruitment, for lack of a
better sort of word side of things, rather than it being an
educational thing." – Participant 16

7.5.2.3   Goals of Anatomy Outreach

As one participant stated about the goals of outreach:

"outreach is so much more than just delivering information… I think
the programs that are really powerful and are successful are the
ones that engage in relationships." – Participant 5"

Further, with the myriad of outreach activities, participants described no singular goal for anatomy outreach. Rather, goals were often described in relation to the overarching types of outreach, and included: Anatomy Nights goals, educational

goals, generic / general goals, public engagement, ulterior goals, and goals related to widening participation (and working with underrepresented groups).

The generic / general goals were the closest to a shared perception for the purpose of anatomy outreach. These included codes for goals such as improving health literacy via anatomy, generally increasing interest in the subject matter, and to even share how anatomy can be 'cool':

> *"This might be a little broad, but I would just say [the goal is] anatomical or health literacy, so... With each of those different things, ultimately, it kind of boils down to getting whatever population we're talking about to know a little bit more about their bodies" – Participant 3*

> *"increasing knowledge and education to the public with maybe a kind of an anatomy focused spin" – Participant 11*

> *"[the goal is to] just kind of be like, look, the body is cool." – Participant 13*

Educational goals focused around inspiring and supporting career interests, and enriching the science education of students:

> *"...create interest in students, maybe in something they knew or they didn't know they're interested in. Or show them other career avenues... I am always hopeful, like some kid that comes to our booth like this could be their first experience, like, wow, I really liked that and this showed their interest. And maybe someday it helped kind of guide their path. That's my big goal." – Participant 13*

> *"The goals of the [name] program was basically to augment or enrich their current education. So they're already learning anatomy and. Yeah, we call it. Kind of enriching that experience, give them some kind of hands on experiences in our lab" – Participant 12*

Widening participation goals shared facets of these educational goals, but were described as distinct by participants. For WP anatomy outreach, activities went further, by focusing on diversity, accessibility, and belonging, in order to support target populations. Anatomy outreachers saw it as their duty to break down barriers, citing universities as places of elitism. However, outreach could be used to demystify university activities:

> *"…like medicine is seen as for the elite. And a lot of these kids, maybe... It seems like something they wouldn't. It's out of reach for them. So I kind of want to just. Always be you know, if you work hard, you can do it…. And I try to kind of relate things that we all experience... just to make it seem like this isn't so like elite and out of reach, you have a body, you can kind of apply these things. And maybe that it will inspire them to want to help themselves, their community and other people." – Participant 12*

> *"WP a lot of it is around sort of reducing the stigma of sort of university. So I think a lot of them come in with the idea that universities are sort of this ivory tower that they they're not a part of and they're not sort of welcome in… showing them that they can, there's nothing to sort of stop them getting to university from an anatomy point of view. They are welcome there" – Participant 16*

Participants also noted that WP outreach goals were not necessarily about 'topping up', but communicating that WP students already 'have what it takes' to pursue health sciences education. Communicating that existing goals were achievable, or could be achieved if students believed in themselves, and fostered growth mindsets was key for this outreach work:

> *"I think it's just trying to put a friendly face to higher education and make it seem I don't want to keep using the word accessible, but let's make it seem accessible and give them confidence that this is a track, that it doesn't matter what your background is. Everybody, if*

you've got close enough grades, you have the skills to be able to do it." – Participant 1

"The primary goal is to raise expectations of participants of medical education primarily, but anatomy in medical education specifically. And I know that the standard lingo is to say raise aspirations, but I think that's actually mis-, it's a misused word, aspirations rather than expectations, because the participants will have aspirations for medical education, have aspirations for higher education. It is just giving them the sense that they have, they can expect more of themselves, to get them to the place where they can see themselves as that thing that they aspire to be... So what we're trying to do is say to them, actually, the skills that surgeon has, you can have and actually you can use what you have now. And therefore we're showing them the first rung of the ladder." – Participant 9

"our goal was to teach them that health science careers or science research careers and things like that are careers that are possible for anyone basically. And that it doesn't really matter what your upbringing is, where you came from, whether or not you like school or if you're good at it, but that by committing to studying and learning and getting all these experiences that it's possible for you to pursue that career or that goal." – Participant 18

Other elements of WP goals including the opportunity to form local pipelines to education, and really generate career interests, for those unfamiliar with health sciences education:

"I would consider [some] programs to be more pipeline programs. The goal of those programs is to encourage students to explore medicine as a career... We particularly try to focus on underrepresented groups to really expose them to people in the profession and to the profession itself." – Participant 12

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"…sure maybe your parents didn't get to go to medical school, or work really hard all day long to make money to support you, but you don't necessarily need to do that. Like you can choose your own path, and you can become a doctor or a scientist. So a lot of times I think these kids they just don't really, they don't really think that because they don't know any doctors or something that they might not be able to be one." – Participant 18

Lastly, while general educational goals partially centred on enrichment and sharing educational knowledge, WP activities had these, but with an element of increasing equity. To participants, some students, and communities, from diverse backgrounds did not have access to even supplemental educational experiences. So considering equity of access, and consciously trying to increase it, was an important goal of WP anatomy outreach:

"I think that these kids probably have fewer opportunities to do that kind of learning. You know, their parents might not be taking them to the science museum. They probably don't have a nanny who's paid, you know, a master's level educated nanny who's doing these all of these sorts of things, developmental things when they're you know what I'm saying? So I would say that these kids have less opportunity to do this kind of learning. And so when you provide it for this group, it's especially valuable." – Participant 5

"And we initially [did lab visits] it was kind of first come, first serve of high school groups. And then when the demand kind of reached over capacity, it then started looking at, OK, well, we should be revaluating who actually gets this opportunity and trying to have it be more skewed to underrepresented populations to give opportunities to students who might not have kind of eyes into that world otherwise…" – Participant 20

Some participants also noted that this idea of equity goals could be applied beyond direct outreach participants. 'Outreaching' to young members of underserved

populations was seen by participants as a means of promoting health equity and literacy for them, and their families:

> *"So for me personally, like I know there's a lot of like specifically immigrant populations, people who may not have had the opportunity to learn more about their bodies, they often are very much at risk of like developing these health conditions, but at the same time, they are the population that knows often knows the least about what's going on in their own bodies. So I feel like it's very important to get that information out, get that message out. And if you can't necessarily get those older individuals into your lab to do stuff, they have jobs, they have lives. They need to take care of things. You can get their children who can, by extension, bring that knowledge to them or at least care for them in some sense, because usually those are the students. Those are the kids that are going to translate for their immigrant parents when they're going to come home." – Participant 3*

Across multiple outreach type goals, there were also 'latent goals' described by some participants, or goals that were underlying or less frequently acknowledged. However, these latent goals were still considered and discussed when participants reflected on goals of outreach, often with caveats that these were not the 'primary' goals. These included the prospect of outreach generating positive marketing or media, or personal and professional benefits to generating outreach:

> *"And I think key to all of it, something that we may be deny, is all of these do serve as marketing opportunities. I think people hide behind that a little bit." – Participant 1*

> *"I think part of it as well is increasing the profile of our medical school. It's probably something that's kind of lurking in the background as well" – Participant 11*

"And it keeps I mean, this is quite selfish, perhaps, but, you know, it keeps things interesting for me. It keeps my job very interesting. Then it's not just about teaching anatomy, it's about teaching anatomy to different groups and in different ways." – Participant 17

"And that's a good way for even for the facilitators to learn more about teaching, and working with people in your community, and whatever like subject matter you happen to be teaching for outreach like anatomy or neuroanatomy. It helps you, like it reinforces learning." – Participant 18

Latent goals also included the potential to use some outreach programs or outreach grants to support financial gains for departments. Such income could then be used to support, in particular, graduate students, who could then in turn help support the outreach for wages. Illustrative quotes about such financial programs are discussed below in the 'Enablers' to outreach section (7.5.2.5).

7.5.2.4 Subject Benefit – Why Anatomy?

A phrase that continuously came up when participants were prompted to reflect on the benefit of anatomy in outreach was 'everybody has a body' – anatomy was viewed as a universal subject, that all people have some relation and context for:

"…everybody has their own body. Like it's not like when you show someone a pair of lungs in the lab, they're like, oh well, that doesn't pertain to me." – Participant 12

"And I also think what's cool about anatomy is that it's relatable, because everyone has a body. Everyone has a brain and all that. And so I think that makes it very helpful to like see what's going on and to be able to hold a human brain, while like you have your own human brain, is really unique." – Participant 18

"I think the thing about anatomy specifically is that, you know, it's something that everyone can instantly relate to because we all have anatomy." – Participant 19

Anatomy was also viewed as unique due to the educational expertise of anatomists. Many said that this educational expertise, that included passion for the subject, educational commitment, and expertise about the body, translated well to outreach activities. Outreach was viewed as a form of educational communication, but with audiences outside of the traditional academia; therefore being an anatomy educator, specifically, offered advantages:

"The second thing I think that makes us a sort of prime candidates for doing this is, is that we often have more contact hours with students than any other basic science discipline, and therefore we have developed a skill set to teach effectively. We're not one off lecturers. We build stories, we tell the story of human function. And because of that, we are innately storytellers, as well. And because we have that skill set, and because we use storytelling to teach our students about the basic body plan, we have an ability to connect with people differently than other basic scientists do as well." – Participant 7

"An example would be like, let's say we're trying to teach students about the brain. You could have a like advanced researcher do it, but they may get too particular about things… That's far beyond the scope of what these students are going to enjoy. You could have a neurologist come in, but they put everything in… a little bit more like higher order stuff clinical. And it's not necessarily going to be fun… As a anatomy educator, you can find those particular parts of those different fields, the clinical side, the more research based sides, pull out the stuff that's relevant." – Participant 3

"Anatomy is not something I learnt as part of a bigger thing. It was my prime focus and I love it. And I definitely think in most of my

teaching, I try and convey that enthusiasm to excite people about

the subject and... Also, because through work, I do anatomy all day,

every day… I'm fully immersed in the subject." – Participant 6

Other sub-categories in the benefits of anatomy in outreach included how the target population might perceive the topic, and therefore be interested in engaging in outreach. This included elements of morbid curiosity / intrigue, providing opportunity for participants to engage in grassroots education about respect:

"People are naturally intrigued. And morbid curiosity kind of is

quite a good hook, I think, with anatomy, with outreach." –

Participant 1

"But then us specifically as anatomists, I think. Just kind of our

dissection, the dissection part of us, and maybe we're seeing as

being a bit more like gory and gruesome and that element of it, I

think people quite like? Because usually there's a kind of like a dark,

I don't know, like a dark side to the events… going to a place where

maybe you wouldn't normally go, and I think that is where

anatomy comes in." – Participant 11

Anatomy was also perceived to be naturally engaging, via the multimodal nature of the subject. This makes it easy to engage anybody with the topic, as anatomy lends well to tactile and visual learning experiences:

"…the grossness of the, kids would come in and be like, oh, this is

nasty, honey, I'm not touching like. And then they come out and be

like, oh, that was so cool, you know, holding a brain and. And I

think I mean, we know from how the brain likes to learn that if you

engage. Like amygdala and autonomic visceral responses, kids will

remember things better" – Participant 5

"It is such an emotional experience or like a different experience

that it's very memorable, like you. Students have been to the doctor

before. They've had their ear exam and they might have had an

immunization before. So at least they've had some exposure, but they probably never had the opportunity to look at a human heart and hold it." – Participant 12

"So I think that what's really neat about anatomy is that, or neuroanatomy, is that it's a science that you can actually really see what's happening, because organs are like big things… So in terms of getting students excited about science it's a good way to show them like in real and let them hold things and touch things and like make it tactile" – Participant 18

"And it's also very visual, like some of the other disciplines that we have in our pipeline, programs like it's hard for them to. If they're doing like a little ECG's on each other or things like that, it's hard for them to like envision sometimes what's actually happening because they're looking at a piece of paper. But in the anatomy lab, everything, or even if you use models, it's just so visual." – Participant 12

Anatomy is a flexible topic, in that the 'difficulty level' can be adjusted with ease, so participants believed a lot could be done with a little, and there were a broad, non-specialist range of topics to draw from for outreach activities:

"So we've got the massive giraffe skull. We've got sort of horse digestive tract where the cecum is hugely expanded. So they sort of look at the like, what is that? And that already is that sort of starts the talking point. But I think on the other hand, like, we've got the human stuff and there's that recognition of this is what it's like inside me. So I think that gets people talking from a different point of view." – Participant 16

"if you have someone who, you know, just studies anatomy in general, it gives the opportunity of these students can kind of pick out what part of anatomy is of interest to them. Right. Not

everyone is interested in neurology as they are in the skeletal

system, or in like muscular system or cardiology or something. And

so it gives more opportunity to latch onto something." – Participant

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Participants also noted the sense that anatomy was a cornerstone or fundamental element of health sciences education, broadening the potential for educational outreach in particular:

"We are the fundamental sort of gateway science, at least in

biomedical terms. Everything that's done in biochemistry and

physiology and in molecular biology is really driving toward what is

making the organism work. We study the organism right. And

anatomy is not just human anatomy. I study more than just

humans. And so I see myself, I see our first sort of major offering to

the public being that we have this base of knowledge that can

connect to all of the other sciences." – Participant 7

"I think it's the pillar of anything health professions related because

everything relates back to that structure you have at the beginning

of every program. You have to learn anatomy. That's kind of a

scaffold for everything." – Participant 12

"So the appreciation in basic science under guards everything that

the clinician does, and that anatomy is the foundation upon which

all, everything else is built. I quite often make the point that the

very first thing a physician observes is anatomy. If the patient

walking in is functional anatomy, you're looking at structure and

you're looking at function of that structure right from the

beginning. And physical examination is all about anatomy to begin

with." – Participant 9

"Well, I think anatomy gives all of this a starting place... anatomy is

able to help people know the science of whatever they are facing in

life, anything that is physically, you know, in terms of the disease,
you know. Illness and disease, I think anatomy should be able to
give people the scientific background for whatever, whatever they
are facing." – Participant 2

Anatomy, in some form, is also often in school curriculum, creating another educational link of baseline familiarity for engaging with participants:

"I think anatomy has lots of advantages in that it's something
that's in the curriculum, too, there is a small element of anatomy,
whether the schools acknowledge it explicitly that is in every
curriculum." – Participant 1

"Even in schools... I think the [country's] curriculum has been
readjusted for children in secondary schools. They, you know, they
do a lot of biology, and they are moving away from plant biology to
animal biology. And they're still going further to human biology. I
think anatomy is having a great impact now." – Participant 2

For participants, the breadth in the benefits and usability of anatomy spoke to the relatability of the subject, as a unifying human (or living) experience.

7.5.2.5   Enablers in Facilitating Anatomy Outreach

As part of a more practical element of the work, participants reflected generally on the things needed to be 'successful' in anatomy outreach.

Given the multimodal advantages of anatomy outreach, reported above, the access to props and space was key. Still, there was a large variability in this, with participants relying on anything from paper models to cadaveric specimens. Anything to make outreach hands-on and engaging was key:

"...the first thing that came to my mind is it needs to be something
tactile, especially when with young, younger audiences, but even
with the Anatomy Nights. And I think the most valuable bit is when
the audience or the people attending can actually get hands on
experience" – Participant 6

Spaces in which outreach is conducted also need to consider the underlying goals:

> *"a space that gives students insight into, like the kind of like I don't know a science career or a health career. Like whether it be in a medical school or in a higher education place just some sort of place… That's just not like their basic classroom because I feel like it helps get them out of that setting in that mindset…" – Participant 18*

In considering space and props, many participants also noted the importance of considering logistics for health and safety in advance, particularly when conducting outreach at university cadaver labs:

> *"There is a percentage of the time that a student will have a vagal event. Right. And they'll just, it will hit them in a way that they couldn't have prepared for because they haven't seen anything like this most likely. So you need to make sure you have a plan and a policy in place" – Participant 4*

> *"in particular for the cadaveric based sessions you need to have like enough preceptors for students to be kind of monitoring and interacting with students in a way that if someone seems to be feeling unwell, you can catch that. And so you need multiple eyes checking out the scene… the preparatory talk of this is what you're about to see in the safety measures…" – Participant 20*

Outreach was also viewed as not just something that comes together; many participants reflected that 'good' outreach requires careful crafting, just as with any positive and impactful educational activity they may create, as part as their established faculty role. Participants recommended doing research, having a plan, garnering creativity, and even considering the underlying pedagogy of outreach, similar to considering constructive alignment of teaching:

> *"I think the one the most important thing is don't reinvent the wheel. There are so many people doing projects. That you don't*

need to start from scratch… find out what's already happening on your campus first... And then. You can either partner or expand or build upon, you know, it's almost like when you do research, like read the literature first and make sure nobody's already done your study or isn't doing your study." – Participant 5

"Ideally, the session would have to be would have to have very simple outcomes. It's not about telling them everything about everything, but pick one little aspect and work, work on how you can demonstrate that to the participants without breaking them or breaking the bank… you want to make the point essentially that this is not grand. You can do this on your own. You could even replicate this for your mum at home to see exactly what you did…"
– Participant 9

"If you don't have a set of learning objectives, then it's really just a wasted opportunity. You want to make sure that that you are building a lesson, even if it doesn't feel like a learning lesson to the people who are participating" – Participant 7

Possessing enthusiasm, and having an enthusiastic team of volunteers, was also seen as a key enabler:

"I think you need volunteers. I have done some things by myself, but it's hard. You definitely need a couple people to help." –
Participant 13

Many participants noted the potential of students as volunteers, both for good ratios of outreach numbers, but also to support underlying role-modelling:

"I think people try to spend too much time doing everything themselves instead of spending the time empowering your team to do a great job. So graduate students are awesome at doing this and they want the experience..." – Participant 5

"I think key, absolutely key is to have students participating as facilitators. There is something to be gained by having someone who's been through a similar process recently. And so near-peer, kind of people would be good." – Participant 7

"And because it was such a big endeavour, we involved a lot of students with. A new fourth year course was started, fourth year undergrad students. And it would be their job to review the college curriculum, their job to create special sessions and to actually teach the session and kind of run it under our supervision." – Participant 12

Further, a couple of participants commented on how the use of student volunteers could be used to the benefit of those students in addition to the outreach event, linking this concept to latent goals. The benefits of student teams could include support for graduate students, financially and experientially:

"So we run anatomy lab tours for high school students as part of our outreach through our [anatomy department]… That program actually was put into place in part to help generate money. This is a really interesting concept, actually, to help generate travel funds for our PhD students in anatomy education to attend conferences. And so it is a for fee service, that we do for local high schools… But we would never turn away a school that couldn't afford it. We would just do it. And we've done that several times… We never accept money from a teacher, it's only from the school districts." – Participant 7

"And then I applied for a grant from the [name] Foundation. In the grant I made a line item for a graduate student paid position… if you could pay a student, to lead the program. One, you're giving a pay check, even if it's part time to a graduate student that helps supplement their income while they're poor grad students. Two. You're giving them leadership opportunity. Three, you're giving

them ownership of the program and something they can put on their CV, that's a leadership position. And so I once I put that into the grant, it got a lot easier." – Participant 5

Linked to this team effort enabler, was the importance of outsourcing, collaborating, and partnering, where and when possible. These actions were perceived as helpful in ensuring that outreach was a positive experience for not just facilitators, but participants and community targets:

"Partner with a community group that does this professionally, like we're scientists and we're trained as scientists, we don't have I don't have a master's degree in non-profit management. So why spend my money and spend my time and energy trying to do something that I'm not highly trained for when I can partner with somebody who does this professionally full time and they can help me with the logistics... what I can focus on is what I'm expert and which is education and anatomy." – Participant 5

"…we have like the communication team that we have at the med school get really involved as well, so they would always kind of communicate with the pub and make sure that any kind of IT that's needed… And then just also they will advertise it and publicize the event and help us with that and then follow up with any. So a lot of the time at the events, people will want to contact the med school afterwards and kind of inquire about what the med school do, whether that be for body donation or just applying to med school and. The communications team are there to kind of pick that up. Which we might not be able to pick that up if we're kind of dealing with somebody else who's asking about, OK, can I can I stick my finger in that liver?" – Participant 11

"I think the most important thing when creating these programs is really keeping in touch with the community and what's actually

happening there and having a really solid contact with someone

who is living there locally." – Participant 15

7.5.2.6   Challenges in Facilitating Anatomy Outreach

Just as there are enablers to the perceived success of outreach, participants described potential issues and drawbacks. These were often described as direct opposites or opposing factors to the enablers, described above.

One of the key challenges of outreach links to its often voluntary or extracurricular nature for facilitators, and the sense of having insufficient or limited resources to support it. While volunteers and occasional lack of financial support were noted, the biggest barrier was time, or lack-there-of, for academics:

> *"It's time consuming, but that's why you have to find the right*
> *people to do it. So the drawbacks of us doing this at [my current*
> *university], is like is my time as a faculty member best spent*
> *teaching high school students all day long when I have a degree*
> *now that basically, like, should I be doing that with my time or*
> *should I be supervising research for medical students? Like, do we*
> *actually need professors to be doing this all day, every day?" –*
> *Participant 12*

> *"The way I see it is you can only be a good science communicator or*
> *educator to the public if you know the field really well. And the*
> *people that know the field really well are often busy people, like*
> *that's just the nature of it. So I think time is a big factor and also*
> *time for the people on the ground." – Participant 15*

Logistics for health and safety was also noted as a potential challenge, particularly being conscious of regulations, and rules to protect not just outreach participants, but anatomical donors:

> *"Different states, different countries, different, I don't know if it*
> *goes down to like the county or city level, but different places have*

all these different regulations that make things like a nightmare to

organize." – Participant 3

"...having someone come in and take photographs without us

knowing... And that's a risk like you're having outside people in

their lab that might not follow your rules the same way that faculty

and your own students would." – Participant 12

"and then I think you have to be, something that I'm hopefully quite

conscious of, is giving students the opportunity to if after this

session you're I try to do a bit of a debrief with students, but after

the session, if you go home and you're not feeling OK about

something or you want to talk about something, that there has to

be a mechanism for students to contact me through their teacher

or whatever and deal with potential unresolved feelings." –

Participant 20

On occasion, outreach was not met with interest or support from the general public;

proving challenging for participants, particularly when lack of interest reflected

larger societal issues in supporting science and scientific outreach:

"And interest, you know, the society, the government, they're not

interested in these types of things. You know, especially medicine

and these types of things, I don't think they're, they're more

interested in politics. And the political will is not there, in order to

promote science. And it's not just for anatomy, it's for science in

general." – Participant 2

However, some posited that anatomy outreach is so low risk and high reward, that

the challenges element of the model can be easily outweighed:

"[Outreach], it's such a low risk, high reward thing" – Participant 4

"But I also find that if you run the program properly, it's very rare

that those [drawbacks] might happen and I think the benefits

outweigh those costs or those risks." – Participants 11

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7.5.2.7   Appraisal of Anatomy Outreach

As one participant described, from a broad perspective, there was a duality to appraisal; one needed to consider appraising outreach based on the impact/goals for the target groups (external), and the impact of the service for facilitators within academic systems (internal):

> *"And I guess there's really two categories to tell you about. One is how to measure the impact of what you're doing within your group. And then the other is how to measure the impact of service as a professional category for a professor." – Participant 5*

From the external appraisal perspective, there were considerations for best versus commonly used means of appraisal, and sub-categories included: anecdotal appraisal (from facilitators), knowledge appraisal, attitudinal appraisal (from participants), and descriptive appraisal:

> *"I see that when I am actually running the sessions, I can see how engaged students become. I can, even students who might kind of initially try to play the disinterested kind of thing. You can always win them over, it seems, by the end and get investment from students. So I see the changes." – Participant 20*

> *"And we do use like a quiz sheet [for Anatomy Nights]… to gauge whether there's any difference in knowledge gain, which there is. So that's great… But when we look at higher level stuff of getting them to apply the anatomy to a scenario that doesn't come through, which I guess is to be expected, if you're giving someone a Contiki tour of the brain in half an hour and then cutting it up when it's a very small lamb's brain to get one to extrapolate that information, I'm just sort of impressed that they've grasped some of the other more basic anatomical features, as it were." – Participant 10*

"…on an individual session basis, obviously feedback from the participants. And sometimes they'll come with, say, teachers, supporters of some sort. You want feedback from those. And it's usually a form to fill out to just simply was this engaging. What did you find worked best? What did you find didn't work? Any suggestions for improvement? That kind of thing." – Participant 9

"And also whether or not the students wanted to come back again and the teachers and group leaders wanted to do it again. And there was a lot of excitement every year for bringing either a new group back or some of the same group and all that. So I think that really was a measure of success too." – Participant 18

Particularly for educational or WP outreach, forms of longitudinal appraisal were regarded as a potential 'gold standard' to assess outreach impact, though no participants conducted this, or were aware of best means to do so:

"I always get told by people, oh you need to measure the impact of the events you're doing. And I think that is really tricky to do, because aside from saying if people turn up, you can't really track people down in a few months' time, How do you feel, having attended this event or come to this workshop?" – Participant 10

"I really think we should track participants and see where they end up and then follow if they do end up in the profession and ask them how that came to be. Maybe it wasn't due to us, but maybe, maybe they were inspired. Maybe they met somebody that became their mentor while they were here. I do know that happens." – Participant 12

For the internal appraisal, sub-categories included university perspectives creating elements of disconnect between outreachers and leadership, particularly when it came to WP activities:

"the ultimate goal is to raise expectations, not so much to recruit people, there's a bit of a disparity between what the universities want and what the program actually wants to deliver. So that conflict sometimes can become a bit difficult to run with. I think if you're organizing, if you're in a place where with my hat on as, my academic lead hat on, I'd be thinking, can I demonstrate this in numbers? But as a tutor delivering a thing, I have a less confined target. It's just me, and I'm doing this because I love to do this, and I want to share my enthusiasm and show them, the participants, they can be anything they want to be. They can be me." – Participant 9

However, participants also reflected on their own participation in outreach as a way to get validation for the time and efforts committed, from academic leadership:

"We are also the only school of medicine department from [name] university that participates [in the local state science festival]. And so the school appreciates it. So the chair of the department has been very laudatory about the whole thing and the dean has recognized our efforts there." – Participant 7

"I mean, one thing I suppose I would say is that because of the publicity that comes with it, I know that people around will kind of know. Will hear more about who I am, I guess, within the med school, because usually if there is an event that has happened, there would be like lots of photos and then there usually be something on the weekly newsletter that comes out and then maybe on social media as well." – Participant 11

"the outreach in connection with the community is something that is part of the university's mandate or goals and vision. So I guess it kind of falls under that category. I don't know if I've really specifically interacted with kind of higher ups to say, look at all

these high school sessions, we're doing kind of thing. It's just

something that we do." – Participant 20

Overall, appraisal, or the best methods of doing so, was a complicated topic for participants to consider about the phenomena of anatomy outreach. Many reflected on how true understanding of outreach impact might not be possible, or that methods described above would be insufficient:

"I don't know if you ever could [measure true impact], really. It's so

personal and they might not think about it right now. It might come

to them later. It's like laying there foundation." – Participant 11

"I guess if the goal is to like have more underrepresented groups

consider science and to create connections in the community, then

we got to, doing like a pre and post knowledge test isn't really

going to capture that?" – Participant 12

The educational concept of constructive alignment also came up again, with how appraisal should ideally be considered and could be elevated:

"So you have learning objectives like what are your what are your

goals when the student leaves your program? What do you want

them to have come away with? And then you have exercises,

learning strategies or you know, or service strategies that try to

meet those learning objectives. And then the assessment should

align with those goals. And I don't think we do that in service

because. One, we don't have a lot of time and we don't think about

it in the way we think about scholarship and... I think psychosocial

research is so hard. There's so many confounding variables. So, and

we're not trained in it." – Participant 5

And for some, just the notion of hope for impact and influence from outreach was viewed as enough to drive and support facilitation:

"I get nothing out of it other than the satisfaction of knowing maybe I reached the kid. Right. But which is satisfaction enough for me." – Participant 7

"I think we're doing it [outreach] as a, as something good that we do and we're able to do and we sort of enjoy doing" – Participant 16

7.5.2.8   Motivators / Drivers to Facilitate Outreach

These elements included the motivators that drove participants to facilitate and continue to engage in outreach. Individuals believed a variety of individual, innate traits made them 'well-suited' for facilitating outreach work. These included traits such as: altruistic, relatable, child-oriented, enthusiastic, adaptable, people person, good communicator; there was a lot of variety:

"But I think that, like, for me, that kind of you just have comfort and just being able to not take yourself too seriously" – Participant 1

"I'd like to say I am the people's person. Back here, you've got to do something for your community, for your immediate community, wherever you find yourself. So that even if you don't really have much money to give them, at least, you know, you've done something for them, you know?" – Participant 2

"I think it's just being a bit more I think you have to have a slightly different little bit of a child somewhere still inside you, especially if you're trying to reach out to a younger audience… Just to not take it so seriously and to not think that anatomy is only for third level, to be in third level education, you must be serious all the time" – Participant 11

Elements of personal identity as a driver were also highly variable, and included codes for many aspects of identity, such as: gender, cultural, political, socioeconomic, familial, religious, and educational:

Familial: "So like for me specifically, my mom has a whole multitude of health issues. And yet most of the health professionals that she works with to get her care don't really do a great job of actually telling her what's going on. It's usually like you have this condition, take this medication, cool. But you can't make informed health decisions for yourself or for anyone you're taking care of, if you don't at the very baseline, know what the hell is going on in your own body." – Participant 3

Educational: "And I resonate with them [outreach participants] in the fact that I am a first generation to go to college type person. So I think that these programs are really vital. And I think that anatomy outreach is, it could be a big part of this because it's a really appealing subject matter and it's something for them to get excited about and it's something that they're going to land in very early on…" – Participant 4

Religious: "I've always wondered, like, why I've liked these types of activities so much and why I've been involved... And I was always involved in my church, and I think that instilled like a lot of the service values..." – Participant 5

Political: "So I live in a place where science denialism, I'm not really sure that's the right word, but it is a word. It is a phrase that's used, is really high, and expertise is not valued like it used to be. And that's just not OK. And the reason it's not OK is that it leads to policy decisions that are not evidence based. And so, our politicians are members of the public. Our politicians are accountable to members of the public. When we work on connecting to the public with what we do, and we do it with empathy." – Participant 7

Gender: "So I'm very passionate about, I guess, promoting science and just general STEM fields, but also knowledge of the body. And I guess also a quality as a woman that I have is I think we should be

comfortable with our bodies and we should be able to discuss

things that we go through on a monthly basis more openly." –

Participant 15

Socioeconomic: "I think part of my background, so I came from a

sort of working class background where we didn't really see

university as something that was all that achievable, or we didn't

really have all that much access to. So now sort of as, I'm now in

that sort of university position, it's that feeling of. If I was in their

shoes, if I was sort of one of these students in these schools, seeing

somebody come in from my sort of background, I think it is, I feel

like it would be more beneficial. If I was in their position, that's

what I would have been looking for." – Participant 16

Still, professional values as an anatomists, or anatomy educators, were the most frequently cited drivers to contribute to outreach efforts. These included professional belief in the work, to genuinely commit:

"And I know for some people perhaps it's a box ticking exercise at

points, but I really enjoy them. And after each session, I come away

feeling great and I'm feeling like I made some sort of a difference"

– Participant 6

For some, this commitment aligned with broader professional beliefs surrounding diversity and equity in education:

"Medical education in particular, has been very elite and niche

and... that carries on, unfortunately, because of the way pre-med

education works. But we have an obligation to society to get people

from all strata engaging with medical education" – Participant 9

"I want to see more diversity in our field. Like if you look at if you

just look at [the country], look at how diverse the patient

population is and or just the general population of [the country]

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versus the people that are physicians or this or that. And it's not equal. And it should be." – Participant 12

"I guess one quality I think I have is I'm a very strong believer of at least as much as we can to provide equal opportunities and to promote equality and representation." – Participant 15

These professional values then linked into a duty of sorts for participants, to 'give back' and use outreach as a means of sharing their knowledge and professional privileges:

"the recognition that I'm in a privileged position and that it's my responsibility to share that privilege and to open that privilege up to others." – Participant 4

"I feel like as anatomists we almost have a duty to share this information with people. Like, we know the truth, and how the heart works. This is our job. We know everything about the anatomy. So I feel like. It's our job to educate people properly." – Participant 13

"it's really important that I got through the system and I've come out the other end and I have a really good job, which I love. And I think it's really important that people like me give back and enthuse kids about it… that's my fundamental belief that actually I have a duty. To at least try and enthuse them" – Participant 17

7.5.2.9   Community Perspectives – Immediate Anatomy Community

There were a variety of views on how anatomy 'outreachers' and their work fit in the anatomy community, including sub-codes considering: professional association / society views, and elements of a divided / challenged anatomy community versus the sense of supportive / collegiate views toward anatomy outreach.

Participants viewed professional anatomical associations/societies, while generally more focused on academic activities, to have expanded in recent years to be more directly supportive of outreach, although there was perhaps still room to grow:

"I would say the until a few years ago, I have always known that the anatomy community was interested in outreach, but I didn't feel like there was a strong impetus to really make change on a global scale with regard to the way that people think about communicating science… [but in the past few years] AAA [American Association for Anatomy] has been really very good about. About promoting the importance of communication and in particular science communication with the public. And so I think that there is a swelling majority or a swelling sizable proportion of our community of practice that really buys into this." – Participant 7

"I'm definitely not an outlier, not an outlier, and I say that because, at BACA [British Association of Clinical Anatomists], we have a very strong educational presence… And in fact, part of our mission statement is to enthuse younger generations of anatomists… So yeah, just speaking out loud. It's made me realize actually BACA's aims aren't so different from what I do with my school children... it's still to enthuse the younger generation." – Participant 17

"the outreach performed by these societies, and there is outreach, outreach officers and so on... But it kind of seems removed, far removed from the coalface where people are." – Participant 9

This may be linked to the prominent consensus by participants that outreach was something that most anatomists were supportive of in the academic community:

"I'd probably have to ask a lot of anatomists before I found one that was like [outreach is] a waste of time, no payoff. Why would I care? I think that would be really hard to find that person in the community." – Participant 4

This supportive attitude towards outreach was attributed to a variety of reasons, including (again) the educational values of anatomy, the sense of community

outreach could foster (via global activities like Anatomy nights), or the sense of duty that was linked to the resource of donors:

> *"I do generally find that anatomy teachers in general, are of a higher standard than some teachers in other fields. I think we are still very passionate about our subject. So, I've not really met anyone that's not particularly great for outreach in some format." – Participant 10*

> *"Maybe it's because we do something different and special. We are working with really precious resources in terms of cadavers and living bodies, we cross that boundary between clinical examination and teaching surface anatomy. So we have two sets of very precious. In anatomy, in the dead body and the living body. So maybe that's why it's I think people just come together a bit more… I think anatomists maybe feel more morally obliged to participate because they know that without the public, without donations. We can't do our job. If we don't participate, then how do people know about being a body donor, for example?" – Participant 1*

However, many participants did note, that as 'anatomy outreachers' themselves, there was likely a perceived bias from the 'bubble' of most direct networks:

> *"I've spent most of my time in the field of anatomy with other educators who have the same values. So I feel like I'm a little bit in a bubble" – Participant 3*

Some went further to consider that outside of bubbles of 'outreachers' there were likely members of the wider anatomy community, regardless of reason, who did not want any part in facilitating anatomy outreach:

> *"I think because there's definitely, I think, a divide in our department of people who are interested in doing like anatomical educational research and then people are just doing more science stuff. And I see the same kind of the same kind of divide with the*

outreach thing… But I've seen very two very different types of types

of anatomists, there" – Participant 11

7.5.2.10 Community Perspectives – Wider Field

There was the sense that outreach, more generally, in the wider fields of STEM and HPE was less prominent compared to the field of anatomy specifically. This perception was attributed to the professional commitments of other fields, not lack of interest, compared to anatomy:

> *"I just think so many of their [other health] programs are so busy*
> *and they're patient focused... I do think some medical students are*
> *very interested in outreach and they do like to help people. But I*
> *think a trait of a lot of people in medicine is altruism. So I think we*
> *have that in common. But I think- anatomy seems very generous*
> *with their time and really wants to reach out. I guess I'm biased.*
> *[Laughs]" – Participant 13*

> *"everyone in science loves sharing science, but... I think anatomy is*
> *unique in that, like the goal of learning anatomy is really to share*
> *knowledge about the body and knowledge about anatomy. But in*
> *other realms, especially like the research realms, I don't think as*
> *much. I think it's more about their individual research and*
> *publishing papers and less about, you know, outreach into STEM."*
> *– Participant 19*

7.5.2.11 Coronavirus Pandemic – COVID-19 Disruptions

As mentioned above in the methods section (7.4.3), while not within the direct aims of this work, the coronavirus pandemic and its societal disruptions affected nearly every aspect of this anatomy outreach model. All previous descriptions reflected a pre-COVID-19 world. Sub-categories for consideration of COVID-19 highlighted: the near-complete halt of all anatomy outreach, community concerns about academic disruptions, and recognition of the wider societal disruptions that may influence outreach.

Participants described the halt in many ways, but what was clear was that most anatomy outreach that participants had discussed and reflected on had stopped:

> *"So I would say it's a big old grinding halt to most activities." – Participant 3*

> *"Oh, it's shattered it completely." – Participant 9*

> *"And so that's [outreach/public engagement] sort of the completely disappeared now, because there's no way that I'm going to rock up to a pub now with a pig heart, and kind of open people to come and see, because we'd hardly be able to fit anyone, and it's not worth the risk at the moment." – Participant 10*

> *"Yeah, pretty much everything got cancelled, in a nutshell." – Participant 11*

Even discussing outreach proved difficult, as even if individuals wanted to, many types of outreach require university visits. And with universities restricted, discussing outreach did not seem appropriate:

> *"I haven't even considered submitting an application for having a high school group come on campus. I mean, the messaging from the leadership of my campus is very much, only come on campus if it's essential to the program" – Participant 4*

> *"outreach activities are not really a thing, both from a perspective of safety of that. We can't we, if we don't even have medical students coming into the labs, but we. So then you have high school students. That's basically a no go." – Participant 20*

As alluded to in the previous quote, all anatomists were also dealing with academic disruptions related to COVID-19, affecting other duties such as teaching and research. One of the biggest academic concerns for anatomists was time. While many lamented at the loss of outreach activities, the academic disruptions caused by

the pandemic created nearly unmanageable workloads, making outreach a low priority:

> *"But with the work that's come with COVID, and moving things online and planning teaching and then having the plans thrown out and replanning teaching, has meant that actually, public engagement is something that I haven't had time in my just life to do." – Participant 10*

> *"And I think because of everything that's been going on, and just trying to kind of figure out teaching and all that stuff, the outreach part probably has gone down the priority list and there hasn't been a virtual replacement… People don't have the mental capacity to do that as well at the moment anyway." – Participant 11*

> *"And so essentially we are, right now the priority has gone to the programs that we are required to deliver and whatnot. And that's basically everyone I think is probably in survival mode." – Participant 20*

Some associated this loss of outreach due to other academic concerns to be a loss, not just to participants, but to facilitators who consider outreach to be a 'fun' or 'refreshing' part of their pre-pandemic workload:

> *"And for us, it's just I don't know. Sometimes I think doing outreach can be really refreshing from kind of day to day teaching and...So it's kind of sad not getting that." – Participant 13*

> *"And part of the fun of it for both educators and the students is in interacting with other students and other educators in person, in a lab together, to really get that feel like this is what higher education in anatomy and science is like. It's not Zoom-based, you know, which is hard." – Participant 19*

But academia was not disrupted in isolation. Participants recognized that not only had their world changed, but the entire world had. Groups that might be targeted

for outreach might not be receptive to it currently. Societal disruptions included the economic concerns of the public, loss of most social activities, and the educational disruptions being experienced at levels below higher education:

> *"But, you know, this kind of outreach program, we want to go outside, you know, with people. And a lot of the [region's] people, they are trying to come out of the economic shock, you know. So approaching them with outreach focus at this point is not very easy." – Participant 2*

> *"people are not really able to engage with a huge amount of things at the moment, so I'm sure that engaging with anatomy specimens is probably low priority for the public who would rather be doing God knows what." – Participant 16*

> *"And I mean, from the high school perspective. So I do know people who are high school teachers… they're doing their best as well. And I don't know if they would actually have the... Energy or the room in their limited, what they have to accomplish now in short times, in order to give time enough to do something like this, because it is more time involved, which you have a bit more flexibility in the normal curriculum, which maybe doesn't exist as easily in this curriculum..." – Participant 20*

Despite considering these broad disruptions, many participants still reflected on the possibility of 'pivoting' their anatomy outreach, so work may continue during the pandemic, citing that creativity, network expansion, and new methods as potential lateral moves as the pandemic continues:

> *"So it's [virtual pivoting] allowed us to run these kinds of [public engagement / scicomm] panels virtually and actually get a larger attendance and broader participation from around the world than we normally would have." – Participant 7*

"...luckily for the work I do... it has affected it but reshaped it. So it's something that can still continue... So we had to transition everything that we planned to an online format and then consider it well, online. But not all of them have access to Internet. Then what are we going to do? So that was the hardest step in terms of impacting the outreach work. But a lot of the other outreach work is virtual, which is really good." – Participant 15

"But the only way forward, I think is to think about how we can engage remotely. And whether that can be done, I mean, thinking about something like an event that is run and delivered in schools by teachers, but is facilitated remotely by one of us. And so we would have to rethink the way we're delivering and because we can't be there with the people we're trying to reach. Perhaps there's a bridge that we can form." – Participant 9

Still, many determined that 'pivoting' would not be the same, and without specific activities especially related to educational outreach, anatomy outreach goals could not be achieved. Pivoting to virtual platforms was viewed as potentially better than no outreach:

"We have some potential options to at least keep things rolling, but they're not going to be as great as they were before." – Participant 3

"I would be interested to see how it might be possible to do the outreach like that virtually. I'm sure there's a way. It's just I don't know how engaging it would be." – Participant 18

But others felt more strongly that pivoting online would result in the loss of the value of many aspects of anatomy outreach. This included the loss of multimodal engagement and loss of social elements that make outreach truly powerful. Some felt these aspects could not be replicated in any meaningful way virtually:

"…we are brainstorming constantly like what on earth are we going to do? And we met with [name] from [non-profit partner program], [who] works with the teachers and works with the kids and we're like, you know, we can we could convert this to online and we could make a little podcast, little TV programs and episodes of all this different stuff. And I was like, do you think the kids are going to even want that? And she goes, those kids are so sick of being learning on screens... The like hands on in the lab, the multimodal like touching, smelling, seeing... There's no replacement for that online, and so I, right now we're just pausing it." – Participant 5

"Opinions on that [moving online], I think are slightly up in the air at the moment. I think part of the anatomy outreach is having that hands on experience, being able to go into the dissection room, being able to actually see the specimens. And I think if we were to design something that's an online outreach thing, I think it risks just becoming a sort of teaching resource that you would have in a school anyway, where it's as good as a sort of textbook or website or something. That's not that it loses that outreach feel… if you're just sort of looking at pictures of them, then what you're essentially producing is something that could well be done by sort of the BBC or something where you might as well just watch Attenborough or something…" – Participant 16

With varying views on pivoting throughout the pandemic, participants reflected on implications of outreach disruptions with different perspectives expressed, again. Some viewed loss of outreach as a serious potential detriment to society, others said it depended on length of loss, and still others felt outreach to be supplemental, and therefore not too much detriment with its loss:

"I think the biggest implication is that those who need, those we are trying to reach the most, the ones we're most concerned with,

the lower strata of society, the unrepresented, are going to be hit the most." – Participant 9

"I really think it just depends on how long all this lockdown and corona business is going to last for, because if it's only this one academic year, I think all the students that will have wanted to come in the past will still come the next year… So I think what we're going to see is maybe we'll have to do double offerings next summer to make up for it. It's, I think it could affect the most the students that were in 12th grade that were going to come because now they're going to be going away to college and maybe they missed getting a connection or something" – Participant 12

"I always kind of viewed them [lab visits] as supplementary and, you know, kind of luxury experiences. So I don't really think it's going to result in any dramatically observable and measurable change" – Participant 4

Finally, participants reflected on how the pandemic highlighted the importance of anatomy outreach, and the duty anatomists hold in providing the public with accurate scientific and anatomical information:

"When we have understanding [of science], we can make policy based decisions that, you know, consider things like the impact of a pandemic on economics… if you completely shut science out of your ability to understand the natural world of, right, then we've got a problem because you don't have all the information that will help you make decisions. And so my impetus for doing all of this [outreach/public engagement] is to make sure that the public understands science well enough to consume it and make smart decisions" – Participant 7

"And I guess there's also a bit of kind of sensitivity about it, and wanting to make sure that any information I'm giving is correct. So

if we did an event, there would be lots of questions about COVID.

And I don't know enough about the anatomy of COVID impacts. I

don't think anyone particularly does at the moment… If I said

something that was wrong, it could diminish people's perception of

it and take it less seriously." – Participant 10

"And I think the pandemic in general, anatomists have been quite

needed because people are more like wondering more about their

body. I'm sure you've had to have so many conversations talking to

people and trying to explain things to them just because we have

that ability for one to communicate and also ability to read a

resource and be able to evaluate it, whether or not it's reliable…" –

Participant 15

Overall, in the midst of the pandemic, participants were struggling to grapple with current restrictions, while also questioning themselves what the 'future' of anatomy outreach.

7.5.3   Conceptual Model of Anatomy Outreach

Per GT methodology, the process should surmise in a conceptual model, often including a visual representation of such. From the previously discussed data, categories, and codes, a conceptual model of anatomy outreach was constructed, and is presented in Figure 6, on the next page. It is worth noting, that this model was constructed from all the data, excluding the portions discussing COVID-19. While this was an important element to discuss and consider, given research context, it was determined, via examination of the data, that COVID-19 was viewed by participants as a disruption to their understanding of anatomy outreach. As such, while it may have influenced many aspects of the constructed model, it is not included as part of the model itself. Additionally, this model has been constructed using the most generalisable categories from this data; this was done so that this model could be tested as a transferrable model, useful for a variety of STEM and HPE fields. This is discussed further below in the discussion of future directions.

Figure 6: Conceptual Model of Anatomy Outreach
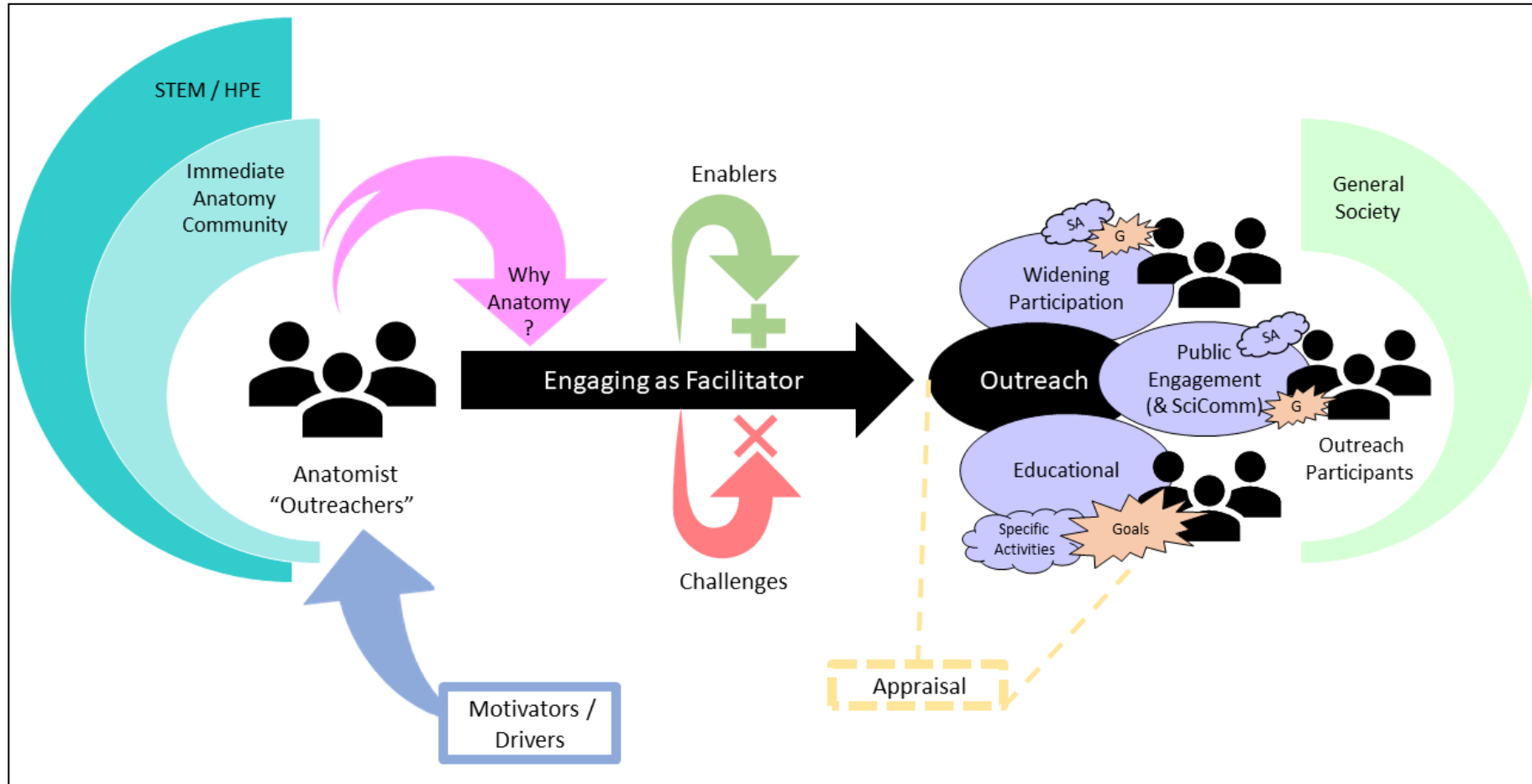
Figure 6: The Anatomy Outreach Conceptual model, derived using grounded theory from data generated from anatomist 'outreachers.' This model depicts elements that influence the phenomena of anatomy outreach, as anatomists engage in facilitation of various types of outreach, with various members of society.

7.6   Discussion

The anatomy outreach model generated from this study's data adds depth to the understanding of anatomy outreach, and also provides ways to reflect on how to improve on ways of working in this field. Particularly in considering WP, this model can be used to as evidence for the potential of anatomy outreach as a unifying, enabling experience for underrepresented groups. So, while this model and data might be useful in conceptualising anatomy outreach broadly, for the purposes of this thesis focus, the following discussion and interpretations are framed with their implications for specifically WP-related outreach.

7.6.1   Why Anatomy? Anatomy outreach as a great unifier and equalizer

This component of the conceptual model demonstrates what it is about the field of anatomy that makes the subject matter so well-suited to outreach, and as introduced in the background of this chapter (7.2), such a common feature of medicine and health-professions related outreach. This work posits that this prevalence is due to anatomy acting as a great unifier for human experience, making it easy to link well to outreach, which requires connecting with individuals outside of academia. Anatomists in this work commented on how 'everybody has a body' in particular as a key point; anatomy is irrelevant to nobody.

Following this point, the relatability and applicability of anatomy offer opportunities to unite people. This also applies within the subject; participants commented on their variety of subject sub-specialties and anatomical interests, and yet all participants shared commitment to anatomy outreach. Teaching and research across anatomy educators, clinical anatomists, and comparative anatomists may be points of differences (Schaefer et al., 2019). But in outreach, these divisions seem less distinct.

Further, anatomy is a concept shared across educational levels and profession, across age, gender, sexual identity, religious, race and ethnicity. Almost everyone has experience with health-related concepts of anatomy, like illness or injury, or when anatomy fails, again making it relatable. The line in sickness and health, until 'death do us part' comes to mind- and actually beyond that. As noted by the

participants, the profession of anatomy requires the living to *rely* on the dead. While no participants commented on the philosophy or theory behind their support for 'everybody has a body,' there is literature that explores this perspective. Particularly in the field of medical history, there is work describing the discourse of the human body as not just a biological entity, but a more complex construct of discourse (Levin and Solomon, 1990; Tierney, 1998; Foucault, 1973; Williams and Bendelow, 1998; Marom, 2020). One such construct is the 'anatomical body' of structure, that is regarded as a shared notion of the body, amongst human beings. This can also be compared to more philosophical considerations, like the 'body of experienced meaning' that makes more considerations for pathology and healing (Levin and Solomon, 1990), rather than the body as an experience in and of itself, as aligns with this work.

Perhaps it is this notion of unity in anatomy, drawing on the importance of the 'anatomical body', that makes it a cornerstone of so many health sciences outreach programs, as described in the introduction of this chapter (7.2.1.2). Within the specific scope of this thesis, this unity may also have particular benefit for WP-related outreach. The ability to connect with any age, any individual, regardless of background, might be considered a key element needed to first engage with target populations for WP activities. Anatomy offers this, and indeed, many participants commented on using this position to engage with WP outreach groups.

7.6.2   Partnerships as Key Enablers – An Important Practice Point

In considering key enablers in running successful outreach, beyond practical activity related suggestions, participants commented on the importance of establishing partnerships and collaborations with local community groups that specialised in educational enrichment. They noted how partnering not only makes enacting outreach easier, but particularly in the case of WP anatomy outreach, can ensure that activities are met with interest and engagement by target populations.

The importance of partnerships is reinforced by the literature. In an extensive literature review, Patterson and Carline (2006) highlight the benefits of partnerships between health professions schools and local public school systems in creating

programs and strategies to support minority access to health careers. This review details elements of best practice for successful partnerships such as fostering sustained interventions, considering resourcing limitations, adapting to specific local sociocultural contexts, and identifying educational missions of all groups. While such details and considerations were not explored in the present work, these categories of 'partnerships' and 'collaboration' might be a key area of focus to further empower and strengthen WP anatomy outreach.

7.6.3   Appraisal – Should we, and if so, how?

Appraisal was one of the topics in the interview schedule generated from the iterative coding process of grounded theory. After the first few interviews, it was identified as a talking-point frequently mentioned by participants, but not in the original questions. It also proved to be one of the more complex, reflective questions. This complexity was deepened by the duality of appraisal- from external and internal perspectives, one can consider the 'success' of outreach for target populations, or how individuals 'succeed' in conducting outreach. For the present scope of the thesis, WP outreach considerations apply more to the former aspect.

Longitudinal tracking of outreach participants was considered an ideal 'gold standard' for WP-related outreach, and perhaps necessary if facilitators were to understand the true impact of goals, such as forming pipelines and generating career interests. However, no participants were aware of any anatomy outreach programs that had reached this standard of appraisal.

Here, returning to the literature may offer insight that anatomy outreachers might find useful in the development of such appraisal. A biomedical outreach pipeline program from Stanford University, that includes anatomy in its curriculum, accomplished such longitudinal tracking of summer program participants (Winkleby et al., 2009). Of 476 participants included in this study, organisers were able to obtain college and career outcomes for 97%, which were then compared to statistics available for similar demographic populations, via United States census data. The results indicated that there was positive association between the program and university 'success,' and subsequent matriculation to medical and graduate

programs, although the authors recognise the limitations of unknown variables and lack of true control group.

It is also important to note that this program required an extensive application process for outreach participants, and is a well-funded program that allows for a directory and database of participant information to be updated each year by dedicated staff. For many of the facilitators in the present work, the ability and resources to track outreach participants in this fashion might not be possible. Additionally, the limitations noted by Winkleby et al. (2009) also reflect what participants in the present study voiced might be a shortfall of longitudinal outreach tracking. Given the psychosocial variables and challenges in creating or identifying a true control, it might not be possible to ever truly ascertain the value to any given outreach experience for WP students, or any outreach activity in general (Fonseca and Finn, 2016). But for some participants within this study, this level of uncertainty was deemed acceptable; they participate in outreach and accept 'optimism for impact' in lieu of any evidence-based confirmation, in the hopes that it really is making a difference for students from WP backgrounds. Still, 'hope' might not be enough evidence in considering the internal aspects of appraisal, noted above; the system of academia is highly competitive, and often clearly output oriented (Grimes et al., 2018). This could create friction for and pressure on 'outreachers' more concerned with optimistically promoting their field, instead of metrics. This applies to anatomy outreach, and beyond, to many sorts of outreach or similar service activities. While this particular study offered no clear findings on navigating this balance, this concern will be revisited in the overarching discussion chapter (see section 10.3.3), in context of work from the other studies of this thesis as well.

7.6.4   Limitations

While this work made efforts to have initial broad recruitment, with purposive sampling, the representation and diversity of the participants should be acknowledged. While there was some diversity in the location of employment of participants, the views expressed are predominantly of those who reside in 'Western' countries. Reflecting on components of critical theory underpinning this thesis, as described in Chapter 6 (6.7.2), this participation means this model is still

grounded in Eurocentric views, which can be considered seriously problematic in creating an inclusive system of medical education (Wyatt et al., 2021a), and is a limitation of this constructed model.

Still, via the methodological employment of theoretical sensitivity, and the attempt to continue recruitment with as broad focus as possible, this model is grounded in data, even if the data sources are limited. Additionally, in considering the overall ethics of the work, and demographic information as it relates to research aims, no additional details such as gender identity, sexual orientation, socioeconomic background, race or ethnicity were collected. These elements could have intersectional insight on the potentially diverse worldview of participants, even within these Western systems of education. Further testing, to see if the model is applicable to other individuals and the outreach they might do in their countries, or as it relates to their backgrounds, is key.

7.6.5 Directions for Future Research

7.6.5.1 Conceptual Model Testing

As mentioned above, this is a model created from a singular data set. Efforts should be made to test the applicability of such a model, and how it contributes to shared understanding of anatomy outreach, with a wider population from the field of anatomy. However, the data represented a variety of groups and settings, and the coding process associated with GT did determine theoretical sufficiency for this work.

Additionally, given the close nature of anatomy with other basic and health sciences, and anatomy inclusion in a variety of medical and health professions program outreach, testing this model in those settings may prove insightful. In the present work, some facilitators posited that other science disciplines may have less advantages in relatability of content speciality to outreach participants, making it potentially less engaging. What are the perceptions of outreach facilitators in those fields, and how do they compare to anatomist perspectives? Similarly, anatomists in the present work felt that many individuals in medical and health professions may be supportive of outreach, but lack the time to sufficiently commit to programs. While

this may not necessarily be an accurate perception, as evidenced in this chapter's background, whether health professionals experience different challenges in facilitating outreach may be of interest. How do medical professionals conceptualise their role in medical or anatomical outreach? In testing this model in allied fields, not only would this provide insights for individual disciplines and their practices, but it might be insightful in working towards more combined efforts for outreach within medicine, health, and STEM fields. As highlighted by some participants in this particular work, even if students do not ultimately decide to pursue medicine or any given health career, if anatomy outreach sparks any interest in any science or higher education, this can be interpreted as 'success.'

7.6.5.2 COVID-19 Consideration

While not thoroughly discussed here, the impact of COVID-19 on anatomy outreach was huge. During the year 2020, while the research was conducted, anatomy outreach was nearly entirely impossible. In the years to come, revisiting the model to see if types of outreach have changed drastically, if motivators/drivers are more linked to societal concerns, and if challenges from COVID-19 persist, will be key.

7.7 Chapter Summary

This study, focusing on the experience of anatomy outreach facilitators, demonstrates that such outreach might have key benefits linked to WP goals. Most notably, anatomy as a socially-connective experience can be used as a starting place to engage any individual with further discussions on health, science, and careers in these fields. This links to theoretical perspectives of the human body, and how the possession of a body can make anatomy outreach successful in creating human connections, via this shared experience. Additionally, recommendations by individuals to use anatomy outreach to engage with local communities via partnerships and collaborations can support educational equity and provision to underserved students. However, understanding the true impact of any individual outreach activity presents many difficulties. People who commit to outreach facilitation should understand the limitations to exploration of outreach success, and consider best practices to try and implement in the future.

These elements, and their implications in conjunction with the other studies presented in this thesis, will be revisited in the general discussion, Chapter 10.

The next chapter of this thesis again provides the perspective of WP/WA facilitators, but focuses on a particular program within UK medical education: Gateway to Medicine years.

Chapter 8: Implementing a New Widening Participation Programme and Means of Selection – Faculty and Staff Perspectives

8.1 Chapter Introduction

The previous chapter discussed approaches to understanding outreach from the perspective of facilitators; it was largely about work that was outside of the university system, as indicated in the WP conceptual model (5.2). This chapter starts to shift the focus of this thesis to mechanisms of WP/WA that are embedded within the university structure. While continuing with the perspectives of the facilitators, this chapter focuses its attention to one specific form of WP/WA in the UK: Gateway to Medicine years. These specialised and resource-intensive programmes are described in detail in Chapter 4 (4.5.1). These programs have rapidly expanded in the last decade. However, there is a paucity of evidence relating to how they actually function, and the extent to which they are likely to meet their objective of widening participation and access to medicine. By focusing on these specified entry routes into medicine, this work also follows the 'journey' that individuals, from WP-backgrounds, can take into medical education in the UK. After an outreach chapter, this section addresses selection and implementation, and, in particular, how Gateway years admissions and years vary from standard entry selection, and its established structure in medical schools.

Here, the function of these programmes is explored by analysing the views of the faculty and staff involved in designing and implementing a Gateway year program in one specific medical school. This chapter evaluates a specific group of participant views, and as such, takes a different methodological approach to that used in the previous chapter. This work 'borrows' a methodology widely used in implementation science, traditionally applied in health care settings, now adapted for medical education.

The reasons for using an approach drawn from implementation science are twofold. Firstly, there has been sufficient literature in the field of medical education, demonstrating success in methodological and theoretical borrowing from allied fields and other disciplines (Varpio et al., 2015; Nicholson and Cleland, 2015; Cleland

et al., 2018). This work could have presented views of staff and faculty in a more simplistic evaluation research method, but this might have limited its generalisability or the potential depth of understanding. Secondly, the selection of the specific implementation theory was also inspired by professional development activities of the author of this thesis. At the 2019 Annual Scientific Meeting of the Association for the Study of Medical Education, the Education Research Committee hosted a workshop session on use of Normalisation Process Theory (NPT) as an implementation tool to better understand the integration of new practices within medical education (Finch and Steven, 2019). Participating in this workshop encouraged the author to investigate NPT, and other implementation theories, as possible means of enhancing the field's understanding of how specifically WP/WA programmes are adopted and implemented by medical schools.

Ultimately, NPT was selected an appropriate theoretical framework to test with the work described in this chapter. This decision also contributed to the duality of aims, addressed in this chapter. The first, following with previous aims of this thesis, was to examine staff views on the process of implementing a Gateway to Medicine year. But the second was to also explore the theoretical and methodological implications of employing implementation science and theory within a specific medical education setting. This duality strengthens the contributions to theory synthesised from this doctoral work.

8.2   Background

Innovation is a constant in medical education and yet implementation of innovative programmes can be a complex process, not dissimilar to the introduction of complex health-related interventions (Mattick et al., 2013). Widening participation (WP) and widening access (WA) initiatives are good examples of such complex programmes. Garrund and Owen describe how WP programmes are complex initiatives, that can be enacted on many different levels, including outreach, Pre-16 education, Post-16 education, work experience, teacher/advisor guidance, and Gateway to Medicine programmes (Garrud and Owen, 2018). These many types of WP and WA are outlined in Chapter 4 (sections 4.3, 4.4, 4.5). But, while Garrud and Owen (2018) describe Gateway years as a form of WP, they may be better understood as a

combination of WP and WA, making them arguably one of the *most* complex of these initiatives in the UK. These programmes target and recruit students from WP-backgrounds, and utilise 'contextual admissions' criteria, reducing the educational achievement required for entry. Contextual admissions thus consider not just the traditional measures of applicants (grades, exam scores, selection assessment performance etc), but also the backgrounds, and particularly barriers, of applicants (as explored in section 4.4.4). This process and these years are thus intended to make admission to medical school more achievable for those facing relative socioeconomic, or educational disadvantage (Curtis et al., 2014a). But this can complicate the selection processes that universities must undertake, altering normal ways of working for admissions teams.

Furthermore, Gateway programmes also go beyond altering entry criteria to medicine, requiring universities to establish a Gateway (or Foundation) year, designed to support these accepted students. Gateway years involve creating curricula to support students in improving their scientific knowledge and educational development. Given successful completion of a Gateway year curriculum, students then 'progress' onto the standard entry medical programme at their university, joining Year 1 cohorts (Curtis et al., 2014b). The differences and details of this Gateway to Year 1 transition, across schools, is discussed in Chapter 4 when detailing the selection process of Gateway years. Still, this year, and subsequent transition, is another potential source of complexity arising from these 'innovative' forms of WP/WA. Medical student cohorts at schools with Gateway years will be comprised of entry-route, heterogenous groups of students; the majority starting medical school in Year 1, but a minority of students starting Year 1 having already experienced their first year of medical school, as Gateway students. The impact this may have on students will be explored in the next study of this thesis, in Chapter 9. But, alteration to selection and curriculum presumedly affect more than students. This heterogeneity of cohorts may present challenges for faculty and staff in classroom management, student support, or even generally addressing students during the start of academic years. And, faculty need to curate an additional year of curriculum

that acts as a 'Gateway', designed to more advanced than A-Levels or Scottish Highers, but not an exact repeat of Year 1 of medical school (Curtis et al., 2014b).

In this brief description of Gateway years, it is easy to see how they can be understood as a 'large-scale intervention' meant to widen participation and access to medicine. Via the creation of an additional year of medical education, these year-long programmes then alter 'normal' ways of working at the institutions where they are implemented. Other means of WP may alter work-loads for facilitators via the establishment of outreach, as described by those in the previous anatomy outreach work of Chapter 7, but these are supplemental or additions to normal ways of working; they do not alter normal teaching of health professions or medical students. Similarly, while WA initiatives alter admissions processes, they again do not typically extend to teaching activities.

Complicating shared understanding of Gateway year function, whilst not necessarily a 'novel' innovation in their existence, there is little published guidance or information on how these programmes are established and grow to become routine means of entry within medical schools (Curtis et al., 2014b; Brown and Garlick, 2007; Garlick and Brown, 2008; Curtis et al., 2014a). There is also a lack of evidence relating to how staff approach their implementation. Despite this, in recent years, there has been a rapid expansion in the number of medical schools establishing such programmes (Medical Schools Council, 2019b; Medical Schools Council, 2018a). This may be because these programmes offer the opportunity for moderate expansion in both the numbers of underrepresented students being offered a place to study medicine, as well as the social diversity of medical schools, without necessarily changing the standard entry setup of medical education. Nevertheless, the current numbers still represent a small percentage of the total medical student places across the UK (Medical Schools Council, 2019b; Garrud and Owen, 2018; Curtis and Smith, 2020), just as with other 'non-standard' entry routes into medicine (Garrud and McManus, 2018).

So, Gateway programmes exist as a complex solution to a complex problem. And one that is being widely implemented for the promise of the solution, ahead of the

evidence. These elements of uncertainty should be considered as drivers for additional research, and this complexity is part of the impetus for the work in this chapter. This type of inquiry is also supported by calls within the field of medical education. In their work conceptualising WA as 'wicked problems', Cleland et al. (2018) note:

> *"One concrete suggestion related to this is to encourage research exploring how change and innovation (e.g. adopting new selection processes or tools) are enacted within localities and how new practices are then replicated or translated into other contexts. 'Innovation' may be embraced enthusiastically, but what are the underpinning beliefs, motivations and political forces that either sustain the status quo or encourage change?" (Cleland et al., 2018: 1234)*

This work, like others (Varpio et al., 2015), also suggest the use of drawing on other disciplinary concepts to approach this type of research, such as design thinking methodologies, that are solution- and action-oriented. Thus, as noted in the introduction of this chapter (8.1), an implementation theory, suggested for testing in medical education, was selected as the guiding theoretical framework for the present work. Given the group interactions required to establish Gateway programmes, the amount of resources required, and the potential of these programmes in supporting WA, understanding the nuances of their implementation is important for policy and practice. Details of the theoretical framework are described below, in the Methods section of this chapter (8.4.1), following the specific research aims and questions for this work.

8.3   Research Aims & Questions

The present study was designed with two aims in mind. The first was to understand staff views on the processes resulting in implementation of a Gateway year in a medical school. The second aim was to understand how implementation theory could be used in the medical education setting, particularly to understand the

complex 'intervention' that is establishing a new educational programme (Gateway year). Thus, this chapter aimed to answer the following research questions:

- Do staff and faculty within the study institution consider the Gateway Year to be implemented efficiently and effectively?
- Are there shared views on the processes of implementation of the Gateway year, including:
  - The meaning and purpose that led to the addition of the Gateway year to the medical school?
  - The commitments of individuals and groups in supporting the Gateway year?
  - The effort required from individuals and groups to sustain the Gateway year?
  - Comprehension of the impact of the Gateway year within the medical school?
- Can NPT be used to effectively research and understand specific medical education programmes?

These aims and questions, particularly related to the implementation aspects, were designed in line with the aim of this doctoral work to understand facilitator perspectives in modifications to selection and curriculum, as a means of widening participation (detailed in Chapter 5, 5.3).

8.4   Methods

This study was approved by the Hull York Medical School Ethics Committee (reference # 19 53).

8.4.1   Theoretical Orientation & Theoretical Framework

Normalisation Process Theory looks at the process of implementing new initiatives, in order to understand the underlying social mechanisms that support implementation, or that create problems in taking initiatives from innovations to standard practice (May and Finch, 2009). NPT can be understood as it sits within the wider field of implementation science; this field is focused on empirical and evidence-based understanding of implementing programmes, particularly in health

sciences. There are broad categories of theories, models, and frameworks used in implementation science with different aims, but NPT falls in the category of a middle-range, implementation theory (Nilsen, 2015). Like other middle-range theories, it focuses on human interaction, rather than the broad occurrences of grand theories or the individual-level details of micro-theories (Varpio et al., 2019). Established in the field of sociology, NPT has been widely used to understand how healthcare interventions are effectively implemented by groups of individuals in complex (clinical) settings (May et al., 2018; May, 2013). And as mentioned in the introduction of this chapter (8.1), Finch, one of the creators of this theory, suggests that use of NPT to understand complex medical education 'interventions' might prove of value (Finch and Steven, 2019).

Further still, the methodological and theoretical aims of NPT aligned well with the goal of understanding of how Gateway years function, particularly as they sit within the wider field of WP/WA. NPT aims to explore determinants of embedding 'complex interventions' in existing social settings (Murray et al., 2010). As discussed in Chapter 4 (4.5.1) and this chapter's background (8.2), Gateway to Medicine programmes can be understood to be very complex, resource-intensive 'interventions', designed to ensure a path for WP students to enter and succeed in medical education. Further, Gateway to Medicine years are embedded in existing medical school structures, that already have standard entry programmes and established means of working, thus altering existing social settings. As such, it was determined that Gateway years are comparable to the appropriate fields of study for NPT, and this theory could be an appropriate, and insightful, framework for the present work.

NPT has established constructs that are used to understand how interventions are implemented into action, then embedded into regular working practices, and eventually seamlessly integrated as part of sustainable work in a given institution (May et al., 2009). It theorises that in order for innovations to be 'normalized' specific social process elements must be achieved by people involved in the work. These constructs frame individual and group understanding of normalisation, and are four-part (May and Finch, 2009): Coherence, Cognitive Participation, Collective Action, and Reflexive Monitoring. Each element then has defining components that

are also specifically named. The framework, and definitions of its elements and components, are shown and defined in Figure 7, on the following page.

While often described separately, each element of NPT, and its components, can interact and influence each other, and can be depicted in more involved flow charts than the version presented here (May et al., 2020). May and Finch (2009), the creators of NPT, also note that the components of NPT can be categorised into 'immediate work' that happens more at individual levels and 'organising work' that requires more group organising action. Also depicted in Figure 7, on the previous page, are the key influences of 'Social Setting' and 'Normal Group Workings.' Context and social settings are key elements in using NPT as a theoretical framework; how individuals in any given setting may understand and work together is unique. This is another factor that makes NPT a potentially good fit for WP and WA work. Research has demonstrated the importance of context and setting, particularly at the medical school level, in enactment of WP policy into practice (Cleland et al., 2015). Further, it has been postulated that there is potential value in applying this particular theory to educational settings. Wood (2017) postulates that NPT could be a useful framework in better understand educational challenges in implementing new programmes, such as top-down management of educational initiatives, how educators understand their agency in innovation, or how scarce resources can be optimally distributed.

In considering the specific field of medical education and the importance of theoretically supported work (Varpio et al., 2019), NPT might be considered particularly valuable. Medical education innovations generally involve multifaceted, interprofessional teams, and individuals must work together to support educational processes; diversity-oriented work in particular is viewed as even more complex due to the social, cultural, and political roots of problems (Cleland et al., 2018), as described in Chapter 3. And as noted in earlier in this chapter (8.2), there is the view that medical education research can largely benefit from 'methodological borrowing' and similar techniques, that can help address problems in new ways, and raise new questions (Varpio et al., 2015; Mattick et al., 2013).

Figure 7: Illustration of Key Elements of Normalisation Process Theory (NPT)
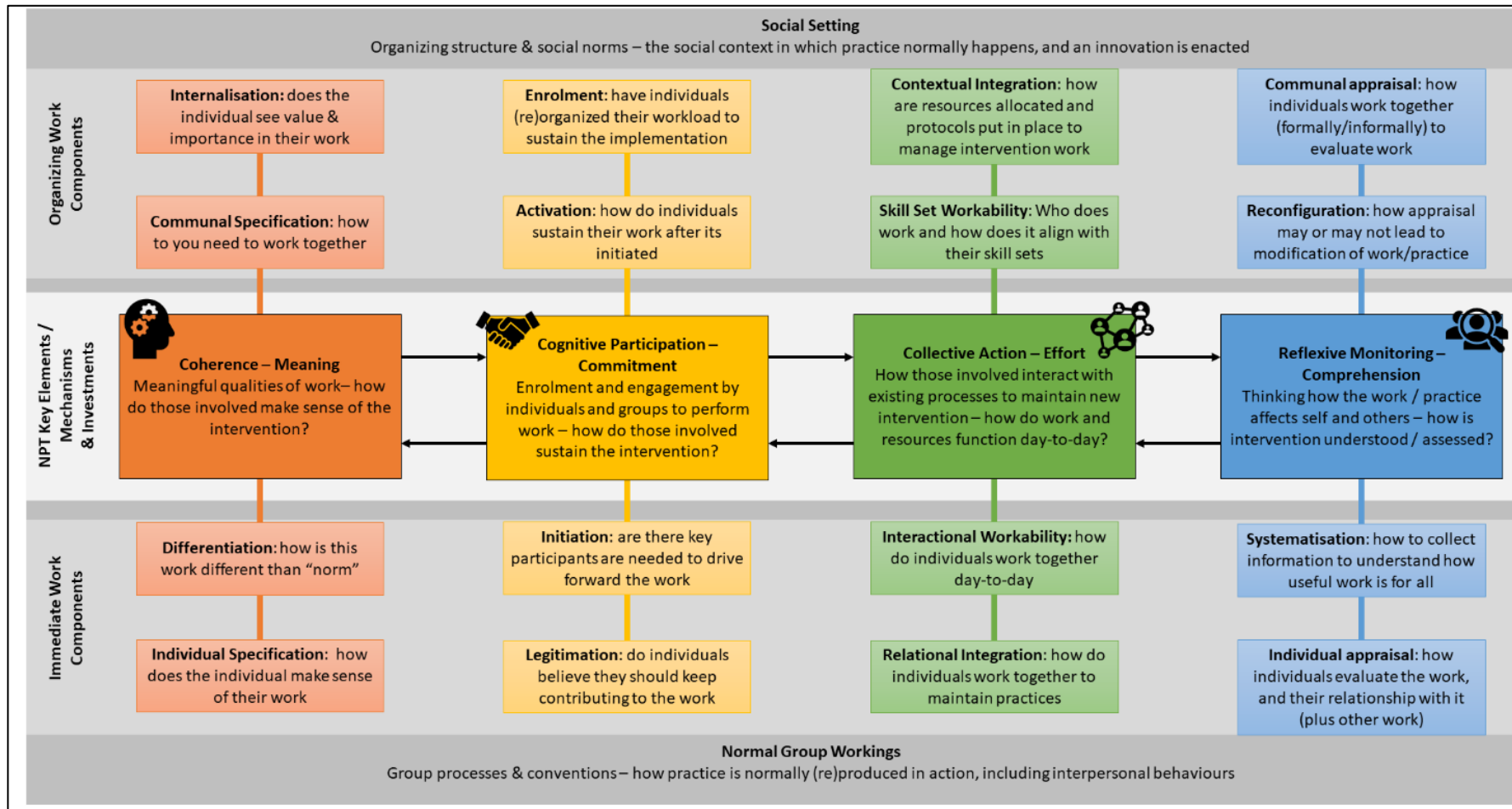
Figure 7: A schematic for Normalisation Process Theory (NPT) framework, defining the key elements and components. Details and definitions modified from May and Finch (2009) and May et al. (2015); there is the distinction between components that involve individual work versus organising work, broadly shown in this figure.

It is also notable that NPT has been used successfully in medical education research to deepen understanding of the institutional factors that may inhibit or promote implementation of simulation-based education (Ferguson et al., 2020). However, this work applied NPT to a broader medical education concept and means of education, focusing on the use of simulation as an educational pedagogy. To the knowledge of the researcher and author of this work, NPT has not yet been applied to understand a specific educational enactment. This makes its present use a novel methodological endeavour in the field. Finally, NPT is a well-established theory, with a website dedicated to research support (May et al., 2015), and this site was referenced to determine if there were appropriate and pragmatic methods for using this theory in the present setting. This element of pragmatism was key in considering the underlying paradigmatic approaches of this doctoral work (see section 6.7.1). It was determined via exploration of existing resources, and discussion with an implementation science expert, that NPT could manageably be used in data collection, analysis, and interpretation.

Thus, the selection of NPT as an appropriate theoretical model for this study helped inform the secondary aims of this work: to assess the usability of NPT as an implementation theory, in medical education research, to understand specific programme enactment.

8.4.2   Participants & Study Setting

Understanding the setting of the study can be key in understanding the means of data collection, and interpretation, especially when work is employed in a single-site, as this was. This thesis was conducted and supported by the Hull York Medical School (HYMS), which in part shows commitment to WP-mission oriented work. HYMS, a multi-site medical school, is located in the northern part of England, in the Yorkshire and the Humber region, jointly governed by the Universities of Hull and York. Established in 2003, it is regarded as one of the 'newer' set of medical schools, founded by the government to support the training of more doctors, and considered to be more focused with WA, particularly for local underserved regions (Howe et al., 2004). The medical school is based at the two university campuses, where students spend their first phase of medical education, prior to more clinically focused phases.

In recent years, the medical school was permitted to expand, with 69% more places for students offered from 2017 to 2019, in response to government funding to further address underserved specialities and communities (University of York, 2018). This included the establishment of a Gateway year, which formally launched in the 2019-2020 academic year. All Gateway year students and their associated learning is based on the medical school's University of Hull site; this is due to the city of Hull and its regional location of Humberside being a particular catchment area for WP demographics. The medical school follows a Problem-Based Learning (PBL) curriculum. Their vision and mission include positively impacting regional health services, including recruitment and retaining doctors to underserved areas.

8.4.3   Data Collection – Part 1: Initial NPT Survey

NPT and its constructs can be used in a variety of methodological approaches and stages of research (Murray et al., 2010). Using the NPT website (May et al., 2015), a survey method was selected as the most practical option for gathering staff views, and for approaching the secondary aim of the present work, testing NPT in a specific medical education setting. The NPT resources website included a 23-item survey instrument, the NoMAD, that can be customised and used in a variety of ways with professionals, to understand implementation of any given work (Rapley et al., 2018; Finch et al., 2018). The development of the survey by the NPT team utilised individual item appraisal, cognitive interviews, piloting, and expert critique; this was done with a range of people, from researchers to those 'on-the-ground' delivering healthcare-related interventions (Rapley et al., 2018).

Given that NPT had not been previously used to understand a specific medical education programme, this survey was also viewed as a good initial starting place to test the theory application, rather than a more involved qualitative approach, where 'richness' of data (Given, 2008) may ultimately be difficult to generate if the theory 'failed' to be adaptable. It is also important to note that this initial survey was a mixed-methods survey, with a combination of attitudinal scale items and follow-up open-ended questions. This was viewed as particularly useful in this setting, where quantitative rankings might be insightful, but would not, by themselves, allow for full participant views to be expressed and captured. The ability of mixed methods

research to gather information both from a quantitative and qualitative perspective (Creswell and Creswell, 2017; Creswell and Clark, 2017), for this initial work testing NPT in this setting, also informed the decision to use the modified NoMAD survey instrument.

The NoMAD instrument (Finch et al., 2015) was modified for appropriate use in the present educational setting, relating specifically to programme implementation of a Gateway year; this modified version is provided in the appendices (Appendix D: NPT Initial Survey (Part 1)). While modified, it was posited that the NoMAD would still be considered a useful tool in the present setting. This is in part because the design of the survey was created so that it could and *should* be easily adaptable to 'plug-in' a variety of 'interventions', where groups are working to implement a programme (May et al., 2015). Thus the 'Gateway year' was used as the 'intervention substitute', with mention of Hull York Medical school used where appropriate.

Purposive sampling (Etikan et al., 2016) was used to target individuals most directly involved in the management, implementation and facilitation of the Gateway year. However, all individuals who were considered staff associated with the medical school met inclusion criteria to participate, given the Gateway year is part of the medicine degree, and interacting with current or former Gateway students could fall in the purview of any individual's role. To reach as many participants as possible, contacts in Gateway steering and curriculum groups were asked to forward the invitation to participate to other staff contacts, including members of module teaching teams. Given the size of the medical school, upon discussion with the research team, it was determined that twenty-four individuals were directly part of the steering and curriculum groups, and a goal of at least 50% survey response rate from this number deemed to be sufficient to understand general views of those involved with planning and delivery, if there was sufficient heterogeneity in the academic position of respondents, thus reducing response bias from certain subsets of individuals (Phillips et al., 2016).

All data collection was conducted near the end of the first year of implementation of the Gateway year. This was to understand, in real-time, how the implementation

was occurring, but to also allow for individuals to have some element of reflexive monitoring on the process. Further, there was an element of practicality to this, given the timeline and requirements of this thesis work. However, in efforts to build upon the initial data collected, and use this work to inform practice, a follow-up survey was designed as a 'Part 2' to this initial line of study.

8.4.4   Data Collection – Part 2: Follow-Up NPT Survey

After initial data were analysed and reported, details were synthesised into a 'short' (15-minute) presentation; an overview of these slides is included in the appendices (Appendix E: NPT Findings/Follow-Up Slides). The presentation was recorded and uploaded to an easily accessible platform (YouTube). The intention of this was internal dissemination of the results, to 'feedback' to the individuals and groups that had responded. Sharing the research to actually inform ongoing practice in the continued implementation of the Gateway year also acted secondarily as a form of member checking for this work (Birt et al., 2016).

In addition to the presentation, a shortened and modified version of the survey used in Part 1 of the work was also created, as a means to collect the data from this member checking activity. This was done to gauge whether individuals felt the findings of the work in Part 1 (still) accurately represented their views on implementation of the Gateway year. As such, the Likert scale items about the NPT domains were replaced with just open-ended items where participants could comment on agreement or disagreement on the findings. This 'follow-up' survey is also included in the appendices (Appendix E: NPT Findings/Follow-Up Slides). Data collection was conducted mid-way through the second year of implementation of the Gateway year. Both surveys (Part 1 and Part 2) were disseminated electronically via Qualtrics, and included consent statements at their start.

8.4.5   Data Analysis

Both sets of data were analysed in similar fashion. First, demographic data were sufficiently deidentified to ensure anonymity in responses by the author of this thesis, prior to analysis and sharing data with members of the research team. This

was particularly important for confidentiality concerns, given the size of the medical school, and broader ethical considerations, as previously explored (6.6.1.2).

For Part 1, survey items employing a Likert-scale response format were analysed using descriptive statistics of rates of response. Further, responses were re-categorised into four simple domains (*Agree*, *Neutral*, *Disagree*, *Not Relevant*) to address low discrimination across the original Likert-scale format items. Open-ended survey items relating to each of the domains were coded using a combined inductive-deductive approach (LaDonna et al., 2018). Components from the four domains of the NPT framework were mapped and used in interpretation, however codes were derived directly from data. Coding was initially performed independently by three members of the research team, to consider different perspectives on the application of the theoretical framework. For Part 2, given the size of the dataset, the primary researcher completed coding, still using combined inductive-deductive approach. These elements were mapped and compared to original data findings from Part 1.

Throughout the process of analysis and write-up, the research team had discussions to check interpretation. The research team for this work included the primary author of this work, her supervision team, but also two members of medical school leadership, representing the Gateway Year and other phases of standard entry education. As members of various levels within and outside of the medical school, with a range of responsibilities directly associated with the Gateway year, a breadth of views was considered, and reflexivity constantly negotiated across the entire team. The researchers approached the work from a pragmatist paradigm, given the implementation focus of the work (Ritchie et al., 2013). This also aligned with the paradigmatic stance of the primary researcher, as described in Chapter 6 (6.7).

8.5   Results – Part 1: Findings from Initial NPT Survey

This first results section describes the findings from the initial NPT survey, that informed Part 2 of this work, with the follow-up survey. The findings presented in this results section were used to create the dissemination presentation that was coupled with Part 2 of this work.

8.5.1   Participant Characteristics & Gateway Involvement

Thirteen completed surveys were collected from a variety of staff within the medical school including: clinical tutors, module leads, admissions tutors, researchers with teaching roles, academic tutors, student support and professional services administration, and programme and university leadership and management. While the sample size was small, it was deemed proportional in comparison to the size of the medical school staff, and particularly those with involvement with the Gateway year (noted above, see section 8.4.3).

The 13 participants were also heterogenous not only in medical school title, but in their role in relation to the Gateway, with the majority involved in delivery (n=7). Slightly more than half (n = 7) of participants marked Hull as their primary site, confirming wide-spread medical school involvement with the Gateway year, despite the Gateway year operating solely on the Hull campus. Participants were skewed towards being both new members of the medical school, and new to the Gateway year, although the latter was logical, given the Gateway year had only been running for less than a year at the time of data collection. Still, this suggests that most participants were not involved in inception and early planning decisions, and may have been recruited directly to support implementation. Complete details of participant characteristics are provided in Table 6.

Table 6: Participant Characteristics for Initial NPT Survey (N = 13)

Demographic Item	Number of participants (n)
Main Role in Relation to Gateway Year	
I am involved in managing/overseeing the Gateway year	4
I am involved in delivery	7
I don't feel I am directly involved	0
Other (Did not specify)	2
Primary Campus	
Hull	7
York	6
Years Worked in Hull York Medical School	
Less than 1 year	4
1-2 years	2
3-5 years	3
6-10 years	1
More than 10 years	3
Years Involved with Gateway Year	
Less than 1 month	1
1-6 months	3

7-12 months	3
1-1.5 years	2
1.6-2 years	2
More than 2 years	1
No direct involvement	1

Additionally, one participant described themselves as having 'No direct involvement' with the 'Years' Involved for Gateway year, although they categorised themselves previously as 'Other' in regards to their involvement. This individual was a member of academic leadership, and may not have regarded the Gateway year under their direct purview.

Participants were asked to first describe their familiarity with the Gateway year, and how it played a role in their current role. The data are detailed in Table 7, on the next page. There was heterogeneity in responses, but they tended to describe the Gateway year as 'somewhat familiar,' and slightly more than a 'somewhat normal' part of work, which could be attributed to data collection being mid-way through the inaugural year of the programme. In considering the future of the Gateway, responses to the feeling of normality changed very little; on average participants believed that the Gateway would become a 'somewhat normal' part of their work, suggesting that participants were still hesitant about the normalisation of the implementation.

Table 7: Data on Gateway Year Involvement from Initial NPT Survey

Item	Responses
When you talk about the Gateway year, how familiar does it feel? (0-10 scale; 0 = still feels very new, 10 = feels completely familiar)	
Average	5.3
Standard Deviation	3.0
Range (Minimum-Maximum)	1-10
Please consider your work for the Gateway year, in context to your overall role in the medical school. Do you feel the Gateway year is currently a normal part of your work? (0-10 scale, 0 = not at all, 5 = somewhat, 10 = completely)	
Average	6.3
Standard Deviation	2.8
Range (Minimum-Maximum)	1-10
Please consider your work for the Gateway year, in context to your overall role in the medical school. Do you feel the Gateway will become a normal part of your work? (0-10 scale, 0 = not at all, 5 = somewhat, 10 = completely)	
Average	6.6
Standard Deviation	2.6
Range (Minimum-Maximum)	1-10

8.5.2   Likert Scale and Open-Ended Responses

Responses to the NoMAD survey were grouped by the four key elements of NPT. As such, Likert scale responses and open-ended responses for the initial survey are organised in this results section by those four elements. Of note, some participants frequently selected that the item was '*Not Relevant*' to them. The reason provided for this was always that the item was '*Not relevant at this stage*' for them, rather than not relevant to their role at all.

8.5.2.1   Coherence

Coherence related to participants ability to 'make sense' of the work behind implementing the Gateway year. There was slight disagreement for 'Staff in the medical school have a shared understanding of the purpose of the Gateway,' with approximately a third of staff (n=4) expressing disagreement with this statement (Figure 8, on the next page).

Figure 8: Graph of Likert Scale Responses for Coherence from Initial NPT Survey
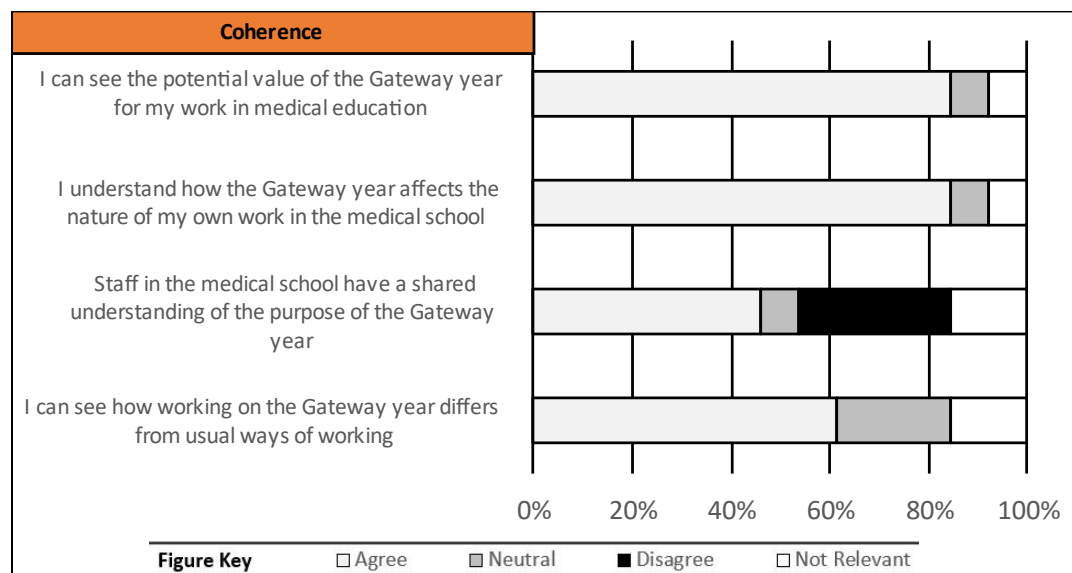
Figure 8: Percentage of participant agreement with statements associated with 'coherence' elements of NPT.

Overwhelming, "widening participation" was identified as the underlying 'strategic purpose,' with the work largely 'making sense' for accomplishing this. However, there were subtle differences in the differentiation aspect, of *how* this work made

sense to individuals. Some believed the widening participation aspect was for the school, and others believed it was for the students. For example, one participant commented about onus being on students, by 'allowing' them in:

> *"It supports a Widening Participation agenda allowing students*
> *who would be unlikely to gain a medical school place directly…" –*
> *Participant 11*

Others highlighted how the widening participation was the duty of the school:

> *"To recruit and train medical students whom the system previously*
> *failed, and to increase academic mobility of students from areas of*
> *lower participation due to socioeconomic factors." – Participant 8*

Internalisation was also prominent in the comments participants made, particularly in considering the Gateway students. There was value in 'helping students' from these backgrounds, describing value in being able to:

> *"help students from deprived areas have a better chance of*
> *becoming doctors." – Participant 7*

Lastly, there was an element of communal specification, or working together, towards shared goals. This largely related to the goals of the local area contributing to the sense-making of having a Gateway year. As one participant highlighted:

> *"This aligns well with local NHS partners' priorities on recruitment*
> *and retention." – Participant 1*

8.5.2.2   Cognitive Participation

Participants required elements of cognitive participation to continue contributing to, and sustain the work of, implementing a Gateway year. Generally, participants largely agreed with the cognitive participation items (Figure 9).

Figure 9: Graph of Likert Scale Responses for Cognitive Participation from Initial NPT Survey
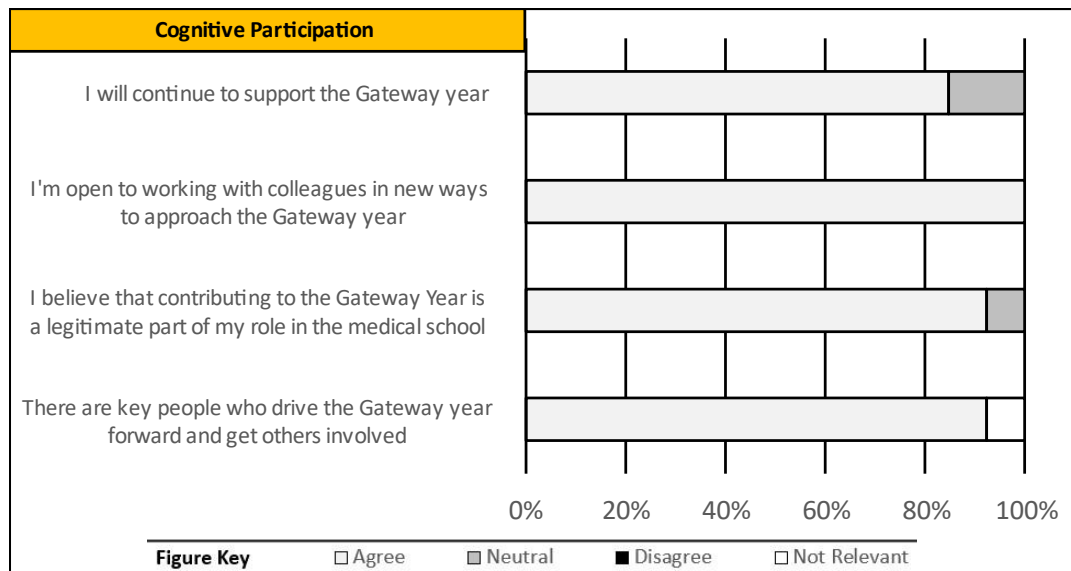
Figure 9: Percentage of participant agreement with statements associated with 'cognitive participation' elements of NPT.

After initiation, this activation of fulfilment seemed to make the work sustainable. There were many comments relating to personal enjoyment:

> *"I enjoy working on new projects… I have benefited from being part of another project and the satisfaction in helping it move towards being delivered as business-as-usual…" – Participant 1*

> *"…enjoyment of teaching and stimulation to go back to fundamentals of medicine when explaining clinical matters…" – Participant 2*

> *"It is a rewarding and vital focus of my role." – Participant 8*

There was also personal value alignment:

> *"Personally it strongly supports my personal views on Social Mobility and Medicine which includes the idea that medicine has lagged behind in widening access." – Participant 11*

These notions were often supported by professional benefit activation:

> *"I get good experience for my CV for future job applications that will involve teaching." – Participant 7*

> *"It is personally rewarding to teach and there is an opportunity to develop new curriculum material…" – Participant 4*

But this was not without concerns related to legitimation and enrolment. Time and other costs were viewed as the downside to participant by a number of participants:

> *"…the work is financially neutral at best." – Participant 2*

> *"Costs are mainly related to time and use of resources which could be used elsewhere if not tied up in the new programme." – Participant 9*

For some, this raised personal questions about sustainability of personal involvement of the work, particularly if enrolment, via re-purposing attention, did not occur. As one participant noted:

> *"[The costs are] "travel, taking time away from research activities, lack of alignment to personal career goals, lack of programme structure…" – Participant 3*

showing that perhaps not all those involved in the work felt it linked well with their professional long-term goals.

8.5.2.3   Collective Action

Collective action builds on cognitive participation, focusing more on the larger group, and how participants had to work together to run the Gateway year. Collective action received the most variable Likert responses (Figure 10), with disagreement across almost all the items. There was disagreement that there was sufficient support (n=3), resources (n=3), and particularly training provided to staff working on the Gateway (n=6).

Figure 10: Graph of Likert Scale Responses for Collective Action from Initial NPT Survey
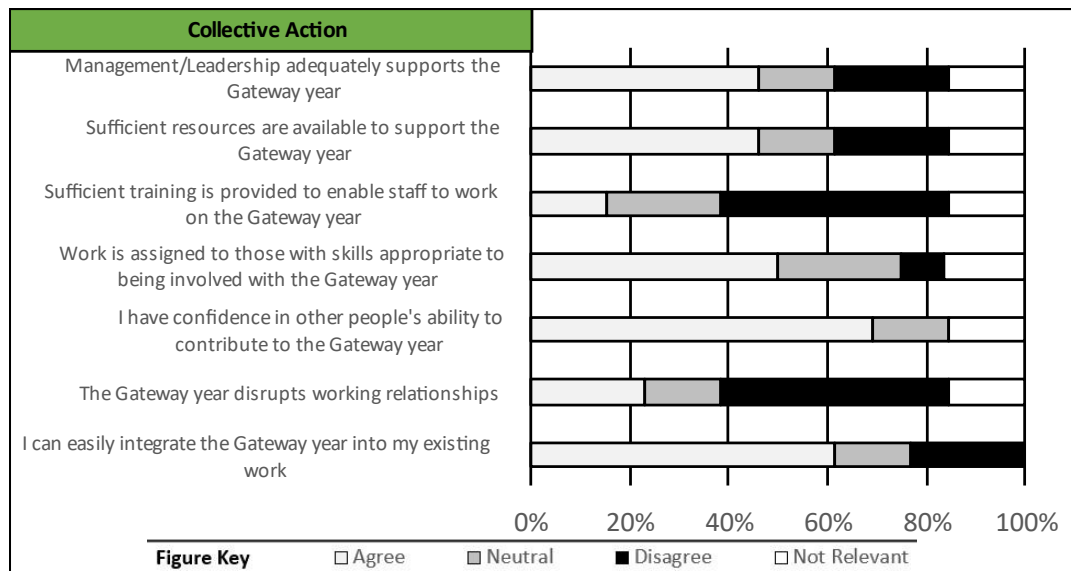
Figure 10: Percentage of participant agreement with statements associated with 'collective action' elements of NPT.

This was also seen in commentary analysis. In open-ended responses, participants focused on discussing the contextual integration, and how resources were focused to support the integration of the Gateway year. Here a wide-range of views were expressed from those who felt the work was accounted for and properly resourced:

> "…a) Reflected satisfactorily in my workload model b) So far resources have been provided when requested." – Participant 8

> "… [Gateway] has fitted in well with my other workload priorities." – Participant 1

to those somewhere in the middle of not being accounted for, but 'making it work':

> "I haven't had any discussion of workload model. I have had to find time as I go along." – Participant 7

to those at the end-of-their-rope with feeling under supported:

> "There hasn't been any reflection within my workload model. I don't feel the leadership really appreciates the work and effort that has gone into Gateway… I think there was a hands-off approach from the visionaries that impacted a lot on the workload of others. I took a step back for my own sanity." – Participant 10

Points made about the collective action, also linked back to other components of the framework, particularly considering cognitive engagement:

> *"Unfortunately this has been time not spent on other responsibilities. I am concerned on how this represented at an organisational level."- Participant 4*

8.5.2.4   Reflexive Monitoring

Reflexive monitoring involved the appraisal and reflection component of implementing the Gateway year, both for participants as individuals, and in communication of appraisal with others. When it came to reflexive monitoring of the Gateway year, there was most variability with being aware of updates related to the progress of the Gateway year (Figure 11, on the next page; Disagree at n=3). Additionally, and arguably most concerning, was that there was disagreement with the statement, 'Staff agree that the Gateway year is worthwhile.' However, this was minimal, with only one participant putting 'Disagree.'

The open-ended questions prompted participants to consider the ways in which the Gateway year would affect them and others, given its normalisation as practice. Responses were largely split between value to the school and society, and value to the students within the Gateway cohorts.

Figure 11: Graph of Likert Scale Responses for Reflexive Monitoring from Initial NPT Survey
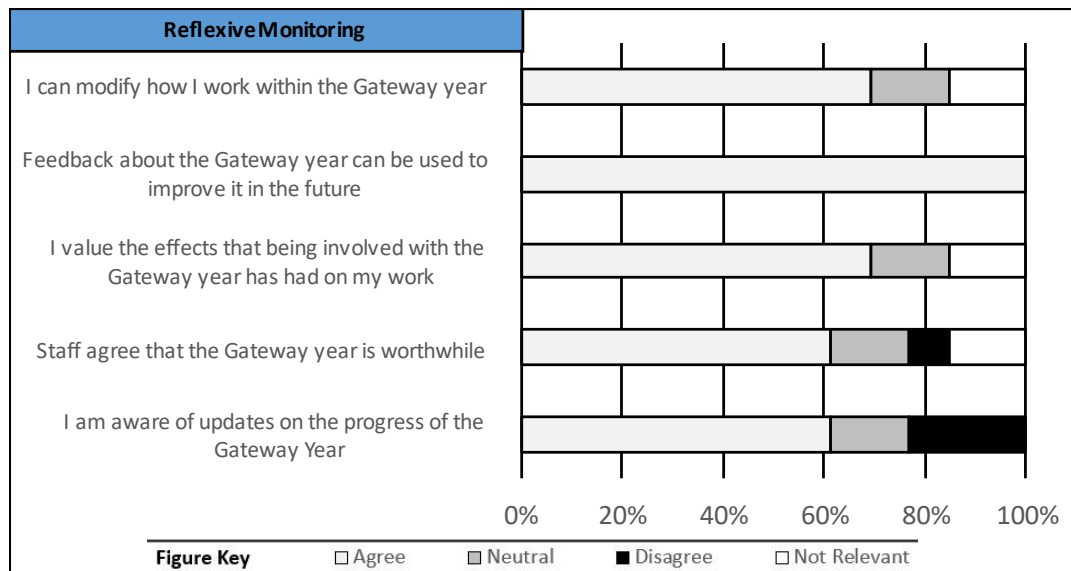
Figure 11: Percentage of participant agreement with statements associated with 'reflexive monitoring' elements of NPT.

However, there were caveats, with participants speculating that full value would not be achieved, without more critical reflexive monitoring, including in regards to better integration:

> "I just worry that we have failed to truly integrate it into the school. I would love to ask the PBL tutors or the immunology lecturers what Gateway is and see their responses." – Participant 10

and being critical, once again, about resourcing:

> "I think it could be of great value but it needs to be well organised by people who have time to do it and who listen to student feedback." – Participant 7

But, some believed this would come with time, given the still relatively early stages of the Gateway year's integration:

> "I think the Gateway year will become a more visible and valued key part of [the medical school] with time and as the students' progress through all phases of the MBBS." – Participant 8

8.6   Results – Part 2: Findings from Follow-Up NPT Survey

8.6.1   Participant Characteristics & Gateway Involvement

Analytics on YouTube showed 19 'Views' of the follow-up presentation, and three 'Likes'. Six follow-up surveys were completed from various members of staff within the medical school, including: clinical tutors, module leads, academic tutors, and student support and professional services administration. There were variances in the participant characteristics from the initial survey, notably with no participants identifying York as their primary campus in the follow-up survey. Details of participant characteristics are described in Table 8. The sample size and variation in respondent characteristics, in interpretation of results, is discussed below.

Table 8: Participant Characteristics for Follow-Up NPT Survey (N = 6)

Demographic Item	Number of participants (n)
Main Role in Relation to Gateway Year	
I am involved in delivery	6
Primary Campus	
Hull	6
Years Worked in Hull York Medical School	
Less than 1 year	1
1-2 years	2
3-5 years	1
More than 10 years	2
Years Involved with Gateway Year	
Less than 1 month	1
1.6-2 years	2
More than 2 years	3

Just as in the initial survey, participants were asked to describe their familiarity with the Gateway year, and how it related to them at present. The data for these items are detailed in Table 9, on the following page. While unable to draw direct comparisons, due to sample size and participant characteristic differences, the follow-up survey indicated participants who did complete it felt the Gateway was a more 'familiar' and 'normal' way of working. However, regard that the Gateway year was to become a normal part of their work was still moderate.

Table 9: Data on Gateway Year Involvement from Follow-Up NPT Survey

Item	Responses
When you talk about the Gateway year, how familiar does it feel? (0-10 scale; 0 = still feels very new, 10 = feels completely familiar)	
Average	8
Standard Deviation	1.8
Range (Minimum-Maximum)	5-10
Please consider your work for the Gateway year, in context to your overall role in the medical school. Do you feel the Gateway year is currently a normal part of your work? (0-10 scale, 0 = not at all, 5 = somewhat, 10 = completely)	
Average	8
Standard Deviation	1.7
Range (Minimum-Maximum)	6-10
Please consider your work for the Gateway year, in context to your overall role in the medical school. Do you feel the Gateway will become a normal part of your work? (0-10 scale, 0 = not at all, 5 = somewhat, 10 = completely)	
Average	5.6
Standard Deviation	3.1
Range (Minimum-Maximum)	1-10

8.6.2 Open-Ended Responses to Follow-Up Survey

Participants were asked to respond to the primary 'take-aways' from the findings from Part 1 of this work, as they related to the four NPT domains: coherence, cognitive participation, collective action, and reflexive monitoring. Note that in this section, each illustrative quote continues to identify a participant number, for communication clarity. However, these are not correlated with participant numbers from the Part 1 survey, as no key participant identifiers were collected, to protect anonymity.

Most participants agreed that there was generally coherence in the sharing meaning and purpose of the Gateway year as a means of WP and WA. Further, there was general agreement that this shared view was best understood by those in closer working proximity to the year:

> *"My impression is that many colleagues are only peripherally aware of the Gateway Year… However when I have discussed Gateway with staff who are not directly involved… they have always seemed very supportive and enthusiastic." – Participant 1*

> *"I think it is appreciated by all in concept but the year remains a mystery to most clinical tutors involved in other years." – Participant 2*

Another participant noted that the interpretation of WP and WA could be limited, suggesting that discourses around the year could be improved:

> *"I do not completely agree that Gateway is just about WP opportunity 'way in'. I think it is about providing something over and above of 5 year programme." – Participant 4*

Participants also generally agreed with aspects of cognitive participation, related to continued engagement, apart from one participant reporting they did not have work capacity to continue to contribute (Participant 5). Still, the other participants noted dedication, enjoyment, and advocation for the Gateway year.

There was also general agreement with elements of collective action, although participants were unsure as to the source of issues in integrating the Gateway year, whether these related more to resourcing or training. Indeed, comments suggested that it may be a combination of both, depending on the aspect of the Gateway year being discussed:

> *"I can understand that a colleague who has been working at HYMS with an established workload might find it difficult to find the extra time required for Gateway teaching." – Participant 1*

> *"For [clinical] placement it feels like Gateway are at the bottom of the pile. I've been trying really hard to get the med school to allow them to come into the HYMS building for teaching but they always say the more senior years need to be prioritised." – Participant 3*

> *"I think it would help if there was more training for placement tutors on what happens elsewhere within the year. I find myself asking the students what they have been learning about as I have no idea." – Participant 2*

Finally, in considering reflexive monitoring, and updates about the Gateway year, participants were more mixed in their agreement with findings from the initial survey. Some participants believed that 'internal' communication was successful:

"We get a lot of updates about Gateway. Considering it is a small cohort, I spend a large amount of time discussing and thinking about Gateway… I think we do get a lot of updates about Gateway and all sorts of things. Probably weekly emails between myself and colleagues." – Participant 4

"…personally I do get regular updates, but I often read whole-school emails which mention seemingly every course except Gateway. Gateway is part of the MBBS so sometimes this makes sense, but in other cases specific mention of factors affecting Gateway such as those associated with COVID19, or specific achievements of Gateway students (or the tutor team!) would be more valuable." – Participant 1

But, as the second participant comment alludes to, there is a lapse in 'external' communication and understanding about the Gateway year. As another participant, who is actively involved in delivery, commented:

"watching the presentation of your survey results is the closest that I've come to receiving feedback on the functioning of the programme. I have no idea what proportion of students went on to Year 1 successfully and of those who did whether they felt they were in a stronger position academically compared to the year 1 students who had come directly from school." – Participant 2

This comment indicates a considerable lapse in communication about the Gateway year's implementation. Still, the benefit of the follow-up survey included asking participants to not just comment on perceptions, but to make active suggestions for improvement of implementation. These suggestions included: trainings and presentations about Gateway year curricula and function (outside of the delivery team, to include more individuals across the school), more thoughtful communication about the Gateway year in school-wide announcements, and 'celebrations' or commendation of the Gateway year, and the positives its students and staff were bringing to the medical school.

8.7   Discussion

This work employed NPT to examine the views of staff involved in implementing a Gateway to Medicine programme, an interventional means of widening access to medical education in the UK, using a novel approach for the field. The findings highlight that implementation of such a programme requires substantial resourcing and considerable commitment from staff. However, implementation will be viewed as something 'worth' the costs and successful, by those involved, if the work aligns to individual social views (widening participation and access to medicine), and if tangible outcomes are seen, particularly relating to creating opportunities for students who would otherwise not be part of medical education. This work also demonstrates how methodological and theoretical borrowing can provide a more detailed framework to elevate medical education research.

8.7.1   The Strain of Innovation on Current Ways of Working

The first major finding in the present study is that the implementation of this programme led to disruption of normal ways of working, particularly in the collective action that needed to be undertaken by the medical school. Participants frequently commented on resourcing, particularly of their time, as a key barrier to normalising the Gateway year. This was found in both Part 1 and Part 2; even more than a year into implementation, the follow-up results highlighted how training and resourcing was a continued concern.

These findings may prove unsurprising, and even common place, to any medical educator who has participated in the implementation of any new and extensive programme. Change is resource intensive. And the challenges of resource-intensive innovations, and how to best address them, has been well-documented in medical education literature, with the expansion of longitudinal integrated clerkships (Hudson et al., 2015), interprofessional education (West et al., 2016), and health systems science (Gonzalo et al., 2018), to name a few. The dissonance that can occur with embracing innovation while aligning it with institutional beliefs, motivations, and politics was also highlighted as a key consideration for WA work in this chapter's background (8.2) (Cleland et al., 2018).

But here, NPT was used to *further understand* the issues, not just recognise them, and assist in designing thoughtful, specific solutions. Further still, this methodological approach seems to support avoiding solutionism (McKenney and Reeves, 2020), or the notion that all 'problems' have easily identifiable solutions, by demonstrating the complexity of implementation, and multiple perspectives as shown in various NPT constructs. This means to add depth to understanding of implementation issues was demonstrated in the previous NPT work from Ferguson et al. (2020), with its examination of simulation-based education curriculum.

In the present work, for the domains of cognitive participation and collective action, there was far more positive agreement and support when individuals considered how implementing the Gateway year related to meaning (cognitive participation). However, in considering support from the perspective of wider group effort (collective action), including the entirety of the medical school and leadership, participants voiced more concerns about commitment, as expressed in the resources and training provided. These trends were seen in both the initial findings, and in the follow-up survey. Furthermore, it is worth here to not the lack of data, as well as the data themselves. As noted in the above results, particularly for the initial findings, nearly all participants viewed their current role in the medical school to have some direct involvement with the Gateway year. Yet, the surveys were disseminated widely, and recruitment and inclusion elements noted that *any* individual affiliated with the medical school could participate, not just those directly involved in planning and delivery. So, why did no more than one individual opt to complete the survey? This work considers two possibilities. First, perhaps recruitment was flawed. Despite using Hull York platforms to advertise the study, those more removed from direct work in the Gateway were less exposed to recruitment. But, related to this, and a more concerning explanation, is that individuals who do not directly consider the Gateway year to be part of their work opted not to participate, possibly viewing the study as irrelevant to them. This is concerning, because this view potentially frames the Gateway year as a 'bolt on' not a fully implemented part of the medical school, that aligns with its mission, and provides a unique entry pathway for students. The former view, as Gateway as a 'bolt on' programme may exacerbate the participant

views that there is a disparity between those most directly involved with the Gateway, and the rest of the school faculty and staff. This distinction may be key in normalising a Gateway year; until members of the team feel that institutional support matches individual commitment, there may be the sense that the Gateway year is not considered standard practice in the medical school.

It may also be worth exploring how individuals understand their link to the Gateway year and university, particularly in a multi-site school, like Hull York, serving a large region. The follow-up survey yielded no responses from York-based individuals. While this may be due to study limitation, discussed below, it would also be the lack of physical proximity to the part of the school that is the Gateway site contributing to commitment issues for this initiative. Additionally, the impact of university culture, may be a subconscious driver (Alexander et al., 2017); University of York is typically regarded as a more 'elite' and 'traditional' school than University of Hull, which may be influencing WP-action at these two sites. The findings may be important for other schools to consider with new or planned Gateway years. Is the campus, and medical faculty, sprawling or a more centred community? Is there a history of 'excellence' at the broader university? Answers to these questions may be particularly insightful in addressing implementation strains before they start.

8.7.2 Aligning Implementation of Innovation with Mission

Another key finding of this work related to the understanding of its purpose, by individuals (coherence). Participants in the initial survey clearly defined the work as supporting 'widening participation,' and many commented on how the goals of WP personally aligned with their beliefs or their belief in the strategic mission of the medical school. The innovation could be easily understood, and its implementation unquestionable in this sense, because it aligned with the missions of individuals, schools, and even local health authorities.

However, it would be remiss to not acknowledge how this view is situated in the broader medical education landscape. The nature of WP and WA work and its 'mission', should be considered more broadly for the 'political' implications. People have differing, and occasionally strong, views on widening participation and diversity

initiatives (Tiffin et al., 2018; Alexander and Cleland, 2018b). These views include differing perspectives on what 'fair access' means in higher education, that link to underpinning values that relate to how medicine functions as meritocracy, to the social responsibilities of medical schools in selection and training the next generation of doctors. This, and other, WP ideologies and discourses were described in detail in Chapter 3 (3.3). The subtle differences in these views were highlighted by one participant in the follow-up survey, who noted that their view on the Gateway year 'benefits' surpassed notions of accessibility, to consider it actually "over and above" the standard entry programme. This aligns with those that support moving WP beyond 'deficit models' of education, to consider the broader benefits of diversification (Greenhalgh et al., 2004). This idea pushes beyond much of the current regard for WP in the field, and was even a minority viewpoint in the present work, where 'WP' was widely accepted. Clearly, there is more work that needs to be done in the field to promote the discourse of WP beyond deficit models. This could be included in training sessions, as participants requested, provided to spread awareness about Gateway years, and the purposes they serve.

8.7.3 Using NPT in Medical Education

This work had a secondary aim of applying theory in a novel way within medical education. This study showed that NPT can be used successfully in medical education, to deepen understanding of complex educational interventions at a programme delivery level. As Ferguson and colleagues also determined in their NPT work related to simulation-based education, NPT can provide empirically robust means to addressing implementation issues in new ways (Ferguson et al., 2020). However, this article makes the point that issues in implementation identified in their work might be attributed to the fact that the intervention in question, simulation-based education, was considered 'additional,' and not part of the mandated curricula. The present work counters this notion. Even though the Gateway year was a formal part of the curriculum, and added a new means of entry to the existing medicine degree, there were still documented issues with prioritisation of workloads, and a sense that a 'whole-staff approach' was not achieved, due to lack of awareness about the programme. Given these

inconsistencies, further research using NPT to understand medical education innovations is warranted.

Still, there are insights that NPT specifically highlights, that can be fed back to practice, in addition to broader understanding of normalisation. Such specific points might not have been highlighted in standard faculty evaluation, demonstrating how NPT can add depth. In the present work, this is most notable in the points made on cognitive participation, but also reflexive monitoring. Understanding the reasons individuals rationalise supporting work (cognitive participation) could prove helpful in future recruitment of like-minded individuals to support implementation and practice. It might also be useful in aligning missions, or understanding, with more 'radical' forms of selection, such as expanded contextual admissions for standard entry. This might also in turn lessen the burden placed on a subset of individuals to run a Gateway year, if an entire medical school could ascribe to cognitive participation in new and WA-purposeful means of selection. Furthermore, understanding where there are gaps in feedback loops (reflexive monitoring), could help improve future feedback, and possibly quicker normalisation, of programmes, both WP and beyond. This was highlighted in the feedback survey, particularly when one participant noted that the present research was their first exposure to any major update about the programme. In this sense, the research has already had positive impact on practice, via Part 2 of the work. And such practice points may not have been identified without the theoretical lens of NPT in this work.

8.7.4   Limitations

The primary limitation to this study was the relatively small sample size, in both Part 1 and Part 2. For Part 1, this meant that Likert-scale item responses were limited to descriptive analysis, and that 'negative' or 'different' views had to be considered carefully, as it in some cases only represented the views of one to two people. This could also lead to over-generalisation of responses. This is particularly important in considering the smaller sample size of Part 2.

However, given the size of the body of staff within the medical school, and particularly those most directly involved with the Gateway year, the sample for the

initial work was determined to be of sufficient size to comment on general staff views. The purpose of a sample size is to be representative of a larger population (Etikan et al., 2016; Phillips et al., 2016). The sample here could be considered representative of the number and type of faculty associated with the Gateway programme and medical school, although it is worth noting that lack of knowledge about staff demographics in the whole sampling frame could raise questions about representation, conflating this limitation. Additionally, while small numbers of 'dissenting' views from most participants should be considered in context, when implementing a new programme negative views can be a valuable source of feedback information that could inform future developments. Furthermore, all comments included participant numbers to be transparent about the individual heterogeneity of illustrative views. Lastly, the nature of the work is also important in consideration of sample size. NPT is often regarded as meant to be a 'starting point' for research and evaluation, not an 'endpoint' (May et al., 2015; Dubrowski et al., 2018). This work aimed to establish a baseline of understanding as to how the programme was being implemented, and to see whether NPT can be practically applied in a medical education setting. And indeed, the first part of this work was then able to give rise to the continuation, via the follow-up work. This allowed for the generation of some suggestions for improvement, that can continue to be fed back to Gateway year leadership. Given the success of using the framework to elicit meaningful and important information to the research team, and members of the medical school, this study provides sufficient evidence that larger scale studies would be warranted, with attempts to improve upon the sample size.

In efforts to address this sample size limitation, it is also important to consider potential 'root' causes. As noted in Chapter 6 (6.2.1.2), this work was conducted during the coronavirus pandemic; this effected not just this doctorate, but all individuals who participated in this study, and the Gateway year itself. The pressures put on academics during this time (Gewin, 2021) may have contributed to lower participation in 'extracurricular' and non-incentivised research, like the present work. Additionally, its worth considering that the methods of the research may have been less conducive, particularly for the follow-up survey. While shorter than the

initial survey, the follow-up required watching a short video and completing the survey; there was discrepancy in the number of views and completed surveys. Further, while not detailed above, one participant in the follow-up reported in several comments that they were unsure about the results, context, and use of NPT. Still, this was only the view of one participant, and all others clearly responded and had suggestions for improvement of the Gateway year via the present follow-up survey format. While dissemination was limited by practical elements related to the pandemic, perhaps in revisiting this work in the future, more interactive methods would help to address responses like this, as well as the overall response and participation rates. Indeed, there seemed to be interest in focus groups from participants who completed the follow-up survey.

A final limitation relates more directly to the use of NPT as the theoretical framework. A key critique of NPT is that this theory 'unnecessarily complicates' what might be considered usual evaluation of an intervention (Ferguson et al., 2020; Bhattacharyya et al., 2006). However, as highlighted in the above section above (8.7.3), in the present work, NPT added an element of depth to understanding of problems, beyond standard evaluation and surveying of faculty views, particularly in understanding motivation and institutional issues. Additionally, it is widely acknowledged that application of theory can make research more robust, and contribute to wider understanding of medical education experience, problems, and solutions (Nicholson and Cleland, 2015; Varpio et al., 2019; Varpio et al., 2015). Lastly, there may be a way to ameliorate the added complication of theory such as NPT in future work. Other work using NPT has re-framed the four domains of NPT, to have clearer titles associated with their meaning: sense-making (coherence), engagement (cognitive participation), action (collective action), and monitoring (reflexive monitoring) (Reeve et al., 2018). Interestingly, these align more with the 'simplistic' themes of meaning for the elements of NPT as described in earlier work by May and Finch (2009): meaning (coherence), commitment (cognitive participation), effort (collection action), and comprehension (reflexive monitoring). Nevertheless, adapting theories, including their language, to be more suitable for medical and health professions education communication, may be the way forward

to ensure that application of theory is accessible, and does not marginalise medical education researchers or practitioners via complicated lexicon.

8.7.5   Directions for Future Research

As mentioned above, future work using NPT in medical education is warranted to help frame understanding of complex innovations. First, more longitudinal work at the institution in the present work could shed light on whether notions of 'normalisation' of a Gateway year improve with time. As some participants noted, reflexive monitoring as to the status of the programme could be improved, but this might naturally come with more cohorts of the Gateway year. Repeating the present study annually, and doing retrospective comparisons, could help establish a timeline for normalising a Gateway year. Or, as noted above from comments on the follow-up survey, what may be more insightful is using the NPT survey as an initial indicator of 'normalisation' of an innovation in a given setting, then utilising other methodologies to explore issues with more depth, and generate conversation on solutions. The creators behind NPT and its resources make clear that NPT can, and perhaps should, be used in a wide variety of methodologies, dependant on research interests (May et al., 2015).

Second, as this tool was viewed valuable within the institution, cross-sectional examination across medical school sites is also warranted. As mentioned in the background of this chapter (8.2) and elsewhere (4.5.1), Gateway programmes have been established since the early 2000s, although there has been rapid expansion of these programmes in the past few of years. Launching this survey at a more national level could help establish validity of this educational modification of the NoMAD instrument, and also indicate whether issues with implementation are universal to Gateway years, or more dependent on medical school.

8.8   Chapter Summary

This study provides a unique and novel way to understand implementation of new programmes in medical education. It highlights how there must be balance between striving towards innovation, supporting social missions, and considering resource allocation, particularly in designing and implementing WP/WA, diversity-oriented

programmes. Drawing on theories and methods from other disciplines can help support understanding and achievement of these goals. Additionally, via the opportunity to feedback on findings, actionable ways to use this research to inform practice were identified.

As noted in the previous chapter summary, the interpretation of these findings in addition to the other results chapters, will be discussed in the general discussion chapter (Chapter 10). The next chapter of this thesis, and the final results chapter, continues exploration of Gateway to Medicine years as a mechanism of WP and WA to medical education. However, the focus now shifts to the actual participants of such mechanisms: medical students.

Chapter 9:   Progressing in Medical Education via a Gateway Year –

The Student Experience from Widening Participation

9.1   Chapter Introduction

This results chapter focuses on the lived experience of students who matriculate through medical education via Gateway to Medicine years. This multi-institutional, qualitative study was designed to explore the experience of students who matriculate and progress through medical education via a Gateway year. These experiences are linked to, and may be applicable, in understanding the experiences of a variety of underrepresented students as they attempt to matriculate and advance through medical education, beyond the scope of these years. The results presented here also shed light on what should be considered part of the continuation of widening participation- retention of students from these backgrounds. Understanding student experiences may also contribute greatly to practice and policy, particularly in UK medical education, for institutions with existing Gateway years, or looking to create them.

9.2   Background

Creating an inclusive environment should be a goal of medical schools, as part of larger diversification efforts. Such diversification is believed to be good for promoting overall social education of all students (Whitla et al., 2003), and may help to address the healthcare needs of underserved populations (Rabinowitz et al., 2000; Boscardin et al., 2014; Tiffin et al., 2018; O'Connell et al., 2018).

As noted elsewhere in this work, in the UK, diversification of medical education is often focused on widening participation for traditionally and disproportionately underrepresented, lower socioeconomic groups (Medical Schools Council, 2014b; Medical Schools Council, 2018e). Widening participation (WP) initiatives, enact policy, programme, and curricular changes that encourage and support students from underrepresented backgrounds to *pursue* medical education as a career option. One of the most resource intensive types of UK WP/WA interventions came about in the early 2000s, with the introduction of Gateway to Medicine years (Curtis et al., 2014a; Garlick and Brown, 2008). These programmes, as a large focus of this doctoral

work, have been described extensively in Chapter 4 (4.5.1), and in the background of the previous results chapter (8.2).

As also detailed in Chapter 4 (4.2.3), most medical schools in the UK operate undergraduate medical degrees, relying heavily on student A-Levels or Scottish Highers (secondary school grades) and medical school admissions test scores, including but not limited to the UCAT, to determine selection. Both of these measures are sensitive to sociodemographic status (Tiffin et al., 2014) . Yet, evidence suggests that actual performance in medical school is not detrimentally affected by prior educational attainment, with medical students from poorly resourced schools with lower grades performing as least as well as those from wealthier schools with higher grades, supporting expansion of contextualized and holistic admissions processes (Mwandigha et al., 2018). Gateway years might be viewed as one means of expanding on contextual admissions processes, as they only consider students from WP-backgrounds, and often place a maximum on grades accepted, ensuring spots on Gateway years go to students who do not have competitive selection criteria for standard entry programmes.

And in terms of academic progression for students who specifically matriculate via Gateway years, recent work suggests that while the numbers are still low, Gateway programmes are a good means of allowing underrepresented students to demonstrate academic success and progress (Curtis and Smith, 2020). Thus, these years can be considered a 'success' in this sense – they address the issues around selection on the basis of prior educational attainment, and the majority of students use these years as a true gateway to medical education.

However, understanding this 'success' of Gateway years in allowing students from underrepresented backgrounds to progress in medical education is a more complex issue than examining rates of retention and academic performance. Gateway programmes not only offer modified standard entry selection, but add an entire year of study duration to the medical course, including initial segregation of entrants, for the vast majority of Gateway years. The implications of this segregation, and how it might impact subsequent progression, has never been explored in published works.

Drawing on wider literature in in medical education, there is evidence that students from low socioeconomic backgrounds can experience sense of 'otherness' or stigma in the elitism of medical education (Brosnan et al., 2016; Southgate et al., 2017; Bassett et al., 2018). However, these findings are from standard entry cohorts of medical students, and therefore cannot directly speak to the experiences associated with a special foundation year, like a Gateway. Without understanding the unique experiences of Gateway year entrants, it is difficult to ascertain whether these years perpetuate otherness for these students, or provide a truly inclusive means of WP, concerned with progression beyond representation.

There may be social costs, as well as benefits, to this particular approach of widening participation and access. Understanding how students experience entry and progression via this route is important in shaping policy and practice around such courses, and indeed, widening access in general.

9.3   Research Aims and Questions

The work presented in this chapter aimed to qualitatively explore medical school lived experience for Gateway to Medicine year participants. This included addressing the following research questions:

- What are the perceptions on the structure and function of the Gateway year itself?
- What are the perceived advantages and disadvantages of matriculating via a Gateway year?
- Does stigmatisation exist for students who matriculate via these specialised WP routes?
- What are the drivers that lead to students matriculating to medicine via Gateway years?

This work specifically aimed to address one of the broader aims of this doctoral work, related to retention, to: explore the lived experience of students who progress through medical education via specialised widening participation routes, as outlined in Chapter 5 (5.3).

9.4   Methods

This study was approved by the Hull York Medical School Ethics Committee (reference # 18 46).

9.4.1   Theoretical Orientation & Framework

This work was conducted within a pragmatist paradigm (Brown and Dueñas, 2019; Ritchie et al., 2013), as much of the work in this thesis, to be able to not just focus on the unique progression experiences of the students, but also focus on student-identified successes and shortcomings of their Gateway programmes. The use of research to focus on potential positive change aligns well with the pragmatic paradigm, with its solution-oriented approach. Further details on this paradigmatic stance of the author of this thesis is included in Chapter 6 (6.7). In that chapter section, the influence of critical theory in elements of this doctoral work is also described. This chapter, out of all the results, has the strongest critical theory influence. The larger portion of this chapter work goes beyond mere evaluation of student entry and experience, to explore progression, often drawing on understanding of power dynamics, empowerment, and stigmatisation (Bunniss and Kelly, 2010). Critical theory tends to centre the everyday experiences of individuals, to define their struggles, particularly as they relate to inherit characteristics, such as gender, ethnicity, race, and sexual orientation (Paradis et al., 2020). The present inquiry draws on these theoretical underpinnings of critical theory research, even by nature of design in focusing on sharing underrepresented views (Bunniss and Kelly, 2010); this is one of the first studies to specifically examine student experiences, framed by Gateway year participation.

Beyond the theoretical and conceptual underpinnings considered (Bordage, 2009), a theoretical framework was constructed for this study, in order to frame interpretation of the data beyond mere programme evaluations (Varpio et al., 2019). Theoretically driven qualitative work is increasingly important in medical education, to build upon the depth of understanding and communication of findings (Reeves et al., 2008; Nicholson and Cleland, 2015). Chapter 7 presented work that drew on the methodologies of grounded theory, and Chapter 8 used normalisation process theory as a guiding theoretical framework of analysis. However, given the focus of

this chapter, and the aims aligned with student experiences, a different theoretical approach was selected. While NPT can be used in many different settings, it focuses on the process of implementing programmes, and therefore 'implementor' views are key. Here, the focus was on the 'experiencers' of a specific programme; therefore, using NPT would not be appropriate. Additionally, as noted in Chapter 1 (1.6), the present study was designed chronologically first; this allowed for the interest and use of NPT to then be subsequently explored in the work presented in the previous chapter.

A grounded theory approach, as used in the anatomy outreach research of this thesis, was also determined not appropriate, as it tends to focus on explanation of phenomena. The present work was designed around interpretation of lived experiences. As such, phenomenology was considered to be an influence on the methodology of this work (Braun and Clarke, 2013). However, as stated above, the pragmatic elements of the work extended beyond a strict exploration of experiences, to include practical and solution-oriented work. This eliminated a true phenomenological study as the 'best fit' for the research aims.

Thus, other theories and methods, particularly those aligned with critical theory perspectives were considered for use in this study. As a research team, the presumed 'purpose' of the Gateway year, as part of the conceptual underpinnings for the work, was considered in the search for appropriate theory. In discussions around this, the notion that the Gateway year was facilitated some transference of 'capital,' or was providing some necessary asset, arose. It is fact that students who enter medicine via Gateway years have quantitatively lower academic achievement than students who enter via standard entry; this is outlined above in this chapter's background and in Chapter 4 (4.5.1.2). Thus, it is logical to assume the Gateway year acts to provide some capital that these students are presumed to need in order to successfully progress to Year 1. But, is the 'capital' that is gained by the Gateway year an academic one? Or, are there other forms of social capital that are just as significant? In considering this research interest in exploring the notion of capital gains via student experiences from a Gateway year, Pierre Bourdieu's theory of

practice was ultimately selected as an appropriate theoretical framework for the present work (Bourdieu, 1986; Harker et al., 2016).

Bourdieu is well known for his inquiries in the field of sociology, particularly in higher education, and empirical research on the social structures that influence and are influenced via education (Grenfell, 2014). Much of Bourdieu's theory revolves around the notion of 'power'; in social spaces, 'power' is required to be 'successful' in that space. This success was often described by Bourdieu as successful 'practice', thus resulting in his theoretical work often being regarded as 'theory of practice.' As for the 'power' that leads to practice, this is 'calculated' by many factors, but perhaps is best demonstrated by an "equation" of sorts that Bourdieu defined himself: [(habitus) (capital) + field = practice] (Burke, 2015). Habitus is the character of individual. This combines with the capital that individual possesses. However, character and capital can vary by the social arena, or 'field', therefore that also needs to be considered to understand the true potential for practice.

In further exploration of this theory, it was considered to be highly applicable to Gateway to Medicine programmes not just for the ability to consider capital. As mentioned in this chapter background, the modification of entry directly correlates to a modification to the 'field' of medical education for Gateway students. And yet, upon completing the Gateway year, these students find themselves situated in the same 'field' (medical school, Year 1) as everyone else. And in most cases (excluding the Extended Medical Degree Programme, Gateway at KCL, discussed in Chapter 4, 4.5.1.3), there is no longer any structured or formalised modification to their field; students must then navigate the standard 'field' of medical education, despite entering it differently.

The other components of Bourdieu's theory were also considered to be potentially insightful as well. 'Habitus', or the character of an individual, is postulated to be formed in early childhood and adolescence. The primary influencers are thought to be family and early education. Students from Gateway programmes are typically first-in-family to attend university. They often attend state-funded schools. These influences will inform a habitus that is different than the more 'traditional' medical

student. And yet, by selecting to pursue and apply to medicine, Gateway students must also be forced to consider 'medical habitus,' or the character traits associated not just with the individual, but with the identity of being a doctor (Luke, 2007). This professional identity may be different, or even at odds, with personal habitus, in individuals who are less familiar with the field.

Further, the flexibility of 'capital' in Bourdieu's work presented many options for exploration, based on how students would potentially describe experiences. Given entry requirements associated with being from low socioeconomic backgrounds, Gateway students have less economic capital, a likely influence on experience. But social, cultural, and symbolic capital may prove as important, particularly as students enter the standard entry field, and continue to progress. Again, being first-in-family suggests the possibility that Gateway students have less social and cultural capital prior to entry. While symbolic capital might be possessed, this may not be the case, particularly in state-funded schools. There might not be the opportunity for students to easily obtain the symbolic capital that would be 'valued' in medicine.

Lastly, Bourdieu's theory was selected as its application has been successfully applied to medical education research, particularly in understanding how social structures act within medical curricula (Brosnan, 2010; Albert and Reeves, 2010; Brosnan, 2009; Brosnan et al., 2016). In particular, the work of Brosnan and colleagues has used Bourdieusian theory to examine medical school cultures, and specifically the experiences of students first-in-family (FIF) to attend university. This application solidified the potential for Bourdieu's theory to be useful in gaining insights from Gateway student experiences, who are also often first in their family to enter higher education, in addition to possessing other 'WP' background characteristics.

Thus, a theoretical framework for the key elements of theoretical application was synthesized from Bourdieu's theory of practice application in the fields of science and medical education (Albert and Kleinman, 2011; Nicholson and Cleland, 2017; Vaughan et al., 2015; Luke, 2007; Varpio and Albert, 2013). Table 10, on the next page, provides descriptions of key components of this framework, drawn from the

aforementioned works in this field. As described below in the data analysis section (9.4.4), this framework was designed to be used in the interpretation of the qualitative findings of this study.

Table 10: Bourdieusian Theoretical Framework Elements, Defined

Component	Description
Field	The social field of interest, that the individual is imbedded in
Habitus	Individual's character, combination of social class and identity, generally structured by early educational experiences and upbringing
Medical habitus	Component of habitus associated especially with being a doctor, such as clinical experiences, skills, knowledge
Capital	Resources that are deemed valuable in a given field
Economic	Financial resources
Cultural	Knowledge/tastes that are beneficial to possess within a particular field
Symbolic	Resources made available based on honour, prestige, recognition
Social (Bonding/Bridging)	Association with beneficial groups; Bonding refers to the capital gained within an 'in-group,' whereas bridging is more focused on how individuals interact and gain resources from outside of their close social networks

9.4.2 Participants

The sampling strategy was largely purposive (Ritchie et al., 2013), to seek participants representing a variety of general Gateway experiences. However, there was an element of convenience sampling; recruitment was dependent on institutional agreement to forward recruitment materials. Snowball recruitment was also encouraged; this sampling techniques allows for members of 'ingroups' to forward recruitment materials to known others, to attempt to reach more potential participants (Noy, 2008).

Institutions with Gateway programmes were identified using the Medical Schools Council (MSC) handbook of entry requirements for 2018 and 2019 entry (Medical Schools Council, 2019a; Medical Schools Council, 2018b). For all the programmes listed in the MSC handbooks with Gateway programmes for 2018 entry, recruitment attempts were made. Potential gatekeepers, including programme leads, student coordinators, and admissions tutors, were identified using medical school websites and personal networks, and contacted via email. Programmes were asked, where possible, to forward recruitment materials for the study to current and former Gateway students, within their medical degree.

Any student who was currently enrolled on a Gateway course, or who had completed a Gateway year as part of their entry into medicine, was eligible to participate. This aligned with the purposive element of the recruitment strategy, and the underlying study aims. Because the goal of the work was to understand a breadth of experiences around progress, regardless of institution or level, any student could participate, as long as they had some Gateway year experiences to reflect upon.

This study also included a small incentive; completion of the survey entered participants in a drawing for one of three Amazon vouchers, and participation in an interview resulted in an £10 Amazon voucher offer. Although small, this incentive system was in place to compensate these WP-background students for their time (Thomas et al., 2019), in addition to other motivations they may have for participation, such as the topic being of interest and value to Gateway year development (Royal and Flammer, 2017). It is not posited that this led to any selection bias in participation (Stovel et al., 2018), given the small financial amount offered.

9.4.3   Data Collection

This multi-method study utilised a combination of a qualitative survey and semi-structured, follow-up interview. The survey consisted of four demographic items (medical school, year in education/training, locality, and WP activity participation history), and three open ended questions, asking students to reflect on; (1) their experienced or anticipated transition from their Gateway year, (2) positive aspects of the Gateway year, and (3) negative aspects of the Gateway year. The positive and negative aspects were asked about using a particular approach. This method involved requesting participants to personify their Gateway year by using "love and breakup letters" to express their thoughts, feelings, and experiences with the Gateway year, to collect richer qualitative data (Hanington and Martin, 2019; Laughey et al., 2021a). Lastly, participants were asked to consent and provide their email if interested in participating in a follow-up, telephone interview. A copy of the survey is included in the appendices (Appendix H: Student Experiences Qualitative Survey).

Interested students were contacted, and telephone interviews arranged. These semi-structure interviews lasted approximately 30-minutes. Participants were asked to further reflect on key experiences relating to their Gateway year, including admission, the actual year itself, and transition to other phases of medical education; the sample interview schedule is included in Table 11. Where appropriate, comments from surveys were also included as interview probes for individual participants to elaborate on. Interviews were audio-recorded, then transcribed verbatim. Interviews were combined as an additional 'item' with the survey data, prior to analysis.

Table 11: Sample Interview Schedule for Gateway Student Experiences Work

Interview Stems
• First, please talk a little bit about your medical education, and where you are at in your training/practice.
• How did or does your Gateway year play a role in your training?
• Do you feel that Gateway Years are an effective method of increasing widening participation?
• Was there ever any sense of stigma you experienced in your medical education, either before, during, or after, your Gateway year?
• If you were in charge, and let's say that money is no option, what type of programme or support would you implement at a medical school to recruit WP students to medicine and make sure that they succeed?
• Do you think your Gateway year played any role in your professional identity as a medical student?
• What do you think were the biggest factors or experiences that encouraged and allowed you to pursue medicine?

Additionally, to protect participant anonymity and use standardised language, almost all references to Gateway programmes were replaced with 'Gateway' where possible to replace the direct second person voice in surveys, and given some institutions call their Gateway programme a 'Year 0' or 'Foundation' year, amongst other names noted in Chapter 4 (4.5.1).

9.4.4   Data Analysis

Data were analysed using thematic analysis (TA) (Braun and Clarke, 2006; Braun and Clarke, 2013; Kiger and Varpio, 2020), drawing more specifically on codebook TA as the methodology, rather than just TA or a true reflexive TA (Braun and Clarke, 2019; Clarke, 2017). In the years since their early publications describing TA, Braun and

Clarke have continued to revisit this methodology, and offer perspectives on how it can be better described, and move towards best quality practice. Unfortunately, TA is often 'slapped' onto qualitative research, without deeper consideration for the choice to use it, and furthermore, clear description of it. With the recommendations of Braun and Clarke in mind, 'codebook' TA was carefully selected as the analytic method that best aligned with the purpose of the work.

Of the three types of TA, they might be considered from most rigid to most flexible (Braun and Clarke, 2020). 'Coding reliability' TA is better aligned with post- or neo-positivist approaches to work, where codebooks are strictly used, and multiple coders are required to demonstrate a qualitative form of interrelated reliability. 'Codebook' TA still uses a structured coding plan, but this is not as strictly adhered to. While multiple coders may be used to inform the process of data engagement, consensus is not regarded as necessary for quality. Lastly, 'reflexive' TA is the most loosely structured, and is a very open process, that does not usually posit the use of even a research team, let alone multiple coders for any sense of 'reliability'. For the present work, following with a pragmatic approach, the middle ground of 'codebook' TA seemed the best fit to explore the research question, while adhering to a replicable methodology, that could be informed by a team approach. Braun and Clarke have also described this branch of TA as a form of "qualitative pragmatism" (Braun and Clarke, 2020), which can be seen here.

Thus, all data were first coded inductively, independently by two members of the research team. The research team for this work included the primary author of this work, her supervision team, and a medical student volunteer interested in gaining medical education research experience; the primary author and the medical student did all initial coding. Codes were then compared, refined, and combined into sub-themes, and themes by the primary researcher. Following with codebook TA, there was no strict guidance for consensus, but the entire research team was consulted in the refinement process, as well as in considering the theming of codes. Generated themes were then interpreted using a deductive approach to categorise them based on the theoretical framework, described above. Figure 12, on the next page, shows

images from the analysis process, aligned with the traditional six-step process associated with TA (Kiger and Varpio, 2020).

Figure 12: Thematic Analysis Process
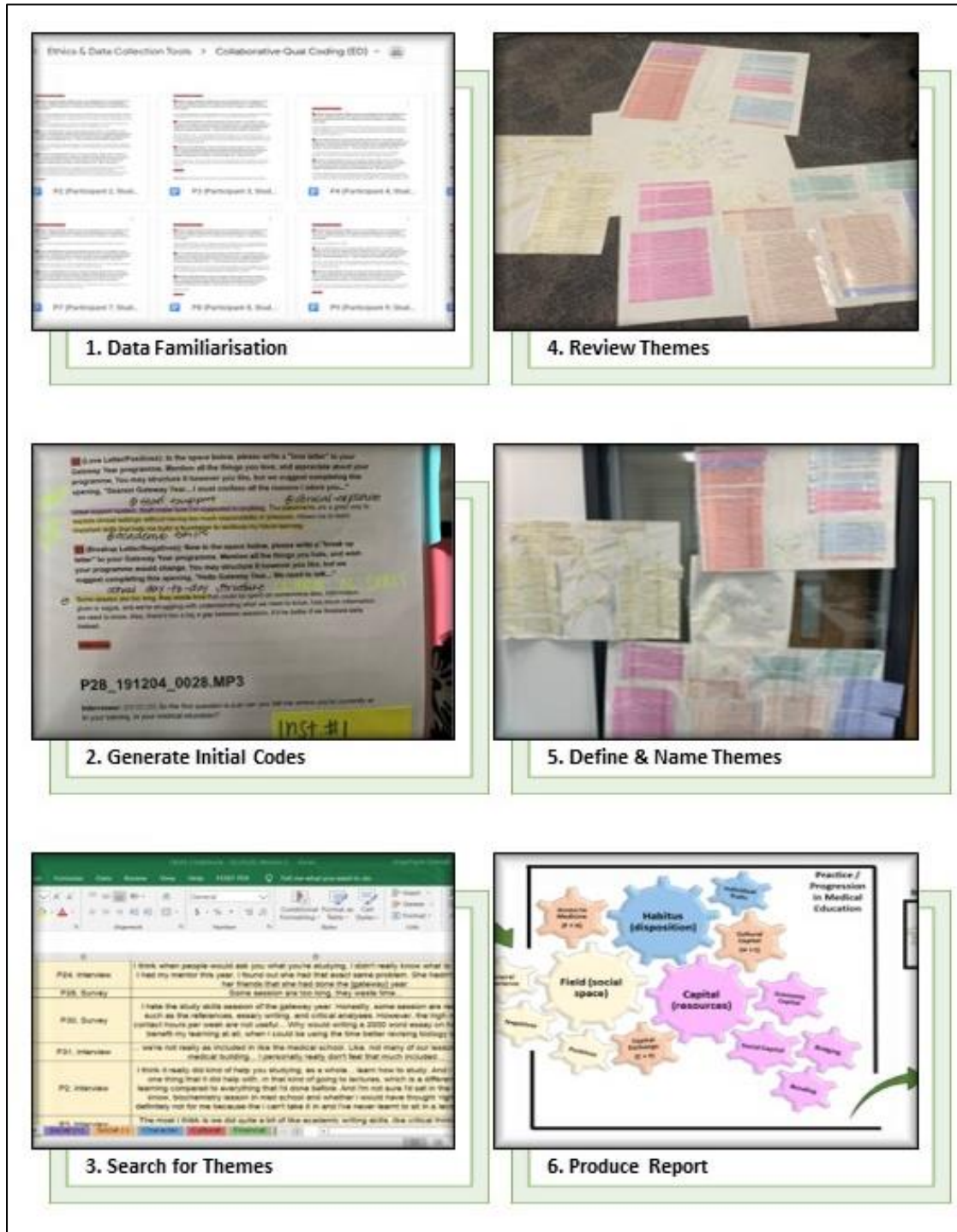
Figure 12: Traditional forms of Thematic Analysis involves six steps; examples in how those six steps were achieved for the present work are shown here.

Additionally, following in recommendations for ensuring quality TA is performed from its creators (Braun and Clarke, 2020), a tool for evaluating thematic analysis was consulted. Finally, while the application of this theoretical lens, and the methods applied, demonstrate how the process drew more specifically on codebook TA as the methodology, rather than just TA or a true reflexive TA (Braun and Clarke, 2019; Clarke, 2017), a reflexive TA element should be noted. This is given the underlying aims of the work, with what may be considered a 'social justice angle' (Clarke, 2017). The work served to provide a voice to this minority group, a voice previously absent in medical education, and this was kept in mind throughout the coding process, and in the eventual selection of included quotes. The focus on the lived experience also 'borrows' from elements on phenomenology, although as mentioned above, phenomenology was not selected as the guiding methodology due to less alignment with the author's theoretical leanings (Varpio et al., 2015).

Reflexivity of the research team was also explored and discussed throughout analysis, as an important part of qualitative inquiry (Guba and Lincoln, 1994). Most notably from the reflexive process: this work was conducted at an institution that recently introduced a Gateway to Medicine year. In part, this means some investment in the Gateway year model as a means of WP, and might perhaps present a narrower view of how they function. However, by expanding recruitment to include multiple medical schools, this work attempted to draw on a broader understanding of lived experience of these types of students. The reflexivity of the primary author was already more extensively described in Chapter 6 (6.2.2).

9.5   Results

9.5.1   Participant Characteristics

A total of five institutions participated in disseminating study materials; Table 12, on the following page, provides contextual information about the medical schools included, while preserving a level of anonymity. This was of particular interest, given the importance that 'field' has in the present theoretical framework. However, it also demonstrates the heterogeneity of the sample, important when considering the generalisability and transferability of results to other contexts.

Table 12: Contextual Information for Medical Schools

Medical School Label (for present study)	Era Founded	General Size (based on SE)	Russell Group School	Educational Approach	Degree	Clearly Articulated WP/WA goals on Website
Institution 1	2000s	Medium	No	Problem-based learning, early and sustained clinical experience	MBBS	No, no statements/sections in 'About' section; single bullet point in 'Vision and Mission' education statements
Institution 2	2000s	Small	No	Problem-based learning, research focused	MBChB	Yes, section focused on 'Widening participation' in 'About Us' section
Institution 3	1800s	Large	Yes	Case-based learning, Integrated systems-based style curriculum	MBBS	Yes, section focused on 'Equality, Diversity, and Inclusion' in 'About' section
Institution 4	1970s	Large	Yes	Small-group teaching, addition of required BMedSci intercalated	BMBS	No, no clear statements/sections in 'About Us' section
Institution 5	1970s	Large	Yes	Multi-method approach to teaching, research focused	BMBS	Yes, clear focus on WP and their Gateway program in 'Who we are' section

Twenty-nine qualitative surveys were completed and 15 interviews conducted, out of 32 initial participants. Table 13, on the next page, provides totals of participant characteristics, including participation numbers, educational level, and institution totals. It should be noted that of the 29 completed surveys, 10 participants (less than half) considered themselves as 'locals' to their current area of study. Additionally, 12 reported they had participated in WP forms of outreach prior to matriculating via their Gateway year.

Table 13: Participant Characteristics for Student Experiences Study (N = 32)

Demographic	Number of participants (n)
Institution (Medical School)	
Institution 1	5
Institution 2	8
Institution 3	4
Institution 4	3
Institution 5	12
Year in Medical School / Training	
Gateway Year	7
Year 1 of Medical School	3
Year 2 of Medical School	7
Year 3 of Medical School	6
Year 4 of Medical School	1
Year 5 of Medical School	2
Intercalation year	2
Foundation Year 1	1
Foundation Year 2	3
Study Participation	
Surveyed	29
Interviewed	15

9.5.2   Qualitative Results

9.5.2.1   Analysis of the 'Field' of a Gateway

Comments coded relating to the 'field' were about the social structure in which participants were 'imbedded,' particularly their Gateway year as the social field of entry. Many of these comments were practical, and related to structure or curricular elements. While participants were generally positive in their regard for their Gateway year experience, a number of negative issues were identified. Students highlighted that there was serious mismatch in basic sciences content:

> *"Some stuff was literally such a copy of A-Levels, so I was sitting*
> *there being like, there's no reason for me to be there... This isn't my*
> *lecturer's fault. I think this is just what he is being told to do... it just*
> *felt very pointless, because when I speak to older medical students*
> *or people who have done the [gateway] year, they were like, 'yeah,*
> *you don't really need to know about the structure you don't, like*
> *nobody needs to memorise all 22 of the amino acids, they just do*
> *that as a time filler.'... the practicals we had were very like even*
> *GCSEs level, very basic, very almost patronising..." – P18, Interview*

Academic skills related activities, such as essay writing, were also viewed as disproportionate, and typically not good preparation for the early medical school years. Clinical content was also commented by some, contributing again to the feeling that the student had not progressed:

> *"You [the gateway year] aren't clinical. I feel like I'm in A levels again but with all the plants taken out." – P11, Survey*

But experiences relating to their modified field was not always negative. Occasionally, basic sciences were regarded positively, especially when they included anatomy. Anatomy was perceived as new, more medically useful, and as providing Gateway students almost an advantage upon entry to Year 1:

> *"... we did some anatomy and that felt... I enjoyed doing that more because I felt like I was actually being useful, like the stuff I was learning was actually going to be beneficial in my long-term career." – P18, Interview*

> *"I am learning anatomy and clinical skills which will help me advance in year 1." – P29, Survey*

The absence of anatomical knowledge and experience for those who did not have the experience was palpable, and extended beyond the Gateway year:

> *"… we didn't really touch on a lot of anatomy. That was a big steep learning curve, joining the normal year." – P14, Interview*

> *"I wish you [the gateway year] had given us a head start on practical anatomy, as the examinations are far from easy" – P12, Interview*

Additionally, there was balanced feedback relating to academic skills, particularly from more mature students. Some students even reflected that perhaps the benefit of the Gateway was not in the details or content, but in the underlying skills provided to succeed:

"I think the main thing with the gateway year is to teach us not the knowledge of medicine, but the skills, like it really focuses on getting down these main skills." – P28, Interview

"The most I think is we did quite a bit of like academic writing skills, like critical thinking kind of stuff, which we didn't do at A level." – P3, Interview

This notion of solid foundational, university-level skills related to the sense that the Gateway 'field' was an opportunity to acclimatise:

"It was a really good year enabling me to settle into university life and gave a broad foundation for the subjects we would be learning in the following years." – P14, Survey

"Gateway year, thank you for easing me into university- no doubt I would have struggled a lot without you!" – P12, Survey

Students also made several general suggestions to assist curriculum and programme leadership in future development. For example, some grappled with the usage of such names for Gateway like foundation, or Year 0:

""Year 0" is so derogatory. Like we aren't even smart enough to have a number." – P5, Survey

Lastly, the physical aspect of the 'field' was a topic of concern. In the day-to-day of teaching sessions, many programmes did not actually hold Gateway sessions in their medical building, or even primary medical campus:

"... we're not really as included in like the medical school. Like, not many of our lessons are in the medical building... I personally really don't feel that much included..." – P31, Interview

This was seen as an issue for students, a physical alteration of the 'field' that physically separated the Gateway students from the medical school linking to social capital detraction, and as the comment notes above, a sense of exclusion.

9.5.2.2 'Habitus' – The Power of Character

In terms of 'habitus', participants reflected on a combination of their personal 'habitus' (general character, identity, social class influences) and how this interfaced with their 'medical habitus' (character associated with being a doctor). Individuals reflected on what made them a 'good doctor' or medical student to be largely personal, and not actually informed by the Gateway or their experience. Frequently, students regarded their background with pride, but also power:

> *"I'm really proud of, of actually getting into the Gateway. I was always like; Oh, I don't really want to tell people where I'm from. I don't want to tell people about my background. Now I'm like, I scream it from the rooftops. I know where I'm from. I love the journey I've had." – P2, Interview*

Participants associated their WP background with having a strong work ethic; this was demonstrated as self-regard, and as regard from others in the field of medicine:

> *"…one of the consultant surgeons that I am with now, was kind of seeing how students from like a widening participation background typically 'want it more,' so they're more likely to work harder, they're more likely to be on the wards, from his experience. And I suppose that was kind of encouraging to hear, rather than hearing it as like, well you've come in with less grades, so you know you're just kind of like a pity case that we'd given. Hearing somebody that's like you've got the drive to be there and you want it." – P11, Interview*

> *"I think now it [the Gateway year] definitely has shaped the way I even approach kind of my practice because I'm very, I think as a clinician, I'm very, maybe a little laid back- I think I'm quite approachable to my patients... And I work really hard and I think that all comes from having to work hard through, kind of to the extra bit to get into medical school and then the extra year. I've just got a work hard mentality now." – P2, Interview*

Gateway participants found their empathy and approachability as more natural, because they could actually relate to a variety of patients due to shared understanding, whether it be financial, or related to diversity, like shared ethnicity:

> *"I think overall in kind of my medical practice I'm a lot more kind of I think I'm more aware of what people go through in life because kind of my background. When my family's had the same struggles, issues, those types of things... I find it a lot easier to relate to people." – P2, Interview*

> *"...when I think about myself being a doctor... where I'm from, there's quite a lot of South Asian, umm South Asian people in the populations... And I think, me being South Asian, means because when I, when I go to hospital, or the doctor, they don't tend to be Asian. But when they are, I think it's a lot easier, because they can communicate with my parents... considering my professional identity, it would be like more focused on how, how who I am, can help the kind of people we look after... with the gateway year, they did focus a lot on like you know, your kind of cultural identity." – P12, Interview*

These factors of identity were so strong, they were viewed as carried throughout training, driving foundational practice:

> *"I'm going to start GP training... I don't think that in itself was influenced by my gateway year at all. However, in terms of populations, I've got real interest in lower socioeconomic groups, and homeless patients. And again, I don't know that that's necessarily directly linked to being a gateway student... but I definitely have that, kind of, from my personal background. I was brought up in a much more diverse area, with I guess the diversity in socioeconomic status as well. And that means so I don't really want to be in a cushy GP practice in a village." – P14, Interview*

9.5.2.3 The Catch 22 of Economic 'Capital'

One of the most obvious forms of 'capital', financial, was a frequent concern for students when it came to their Gateway year. This was regarded as a 'Catch 22' in many ways; students who knew they were from the most disadvantaged backgrounds, were put in further disadvantage:

> *"… you are paying for an extra year... when you're applying for student loan and things, they don't really take into account that you've got an extra year... so it becomes really difficult and you go around and round in circles, trying to get the issue of finance, which obviously, the whole reason that you're applying is because you're from a widening access background, and have not very much money." – P2, Survey*

> *"I'd had to apply for hardship funds in my, my final three years at the university I think... I got an NHS bursary, not student loan, which is far less than what my colleagues were getting. So it's kind of, I was under the impression that, I was kind of coming into medicine from a worse background than other people initially who kind of do medicine. Yet, I was being penalised for it, because I've done an extra year, so it felt exceptionally unfair at the time." – P3, Interview*

For many, their lack of financial capital then proved to be a continuous stress:

> *"Doing six whole years at university is hard when you have to fend for yourself. I was so worried about how I would pay my rent; I'd lose sleep and I'd be in a constant state of anxiety... I am in so much debt I can't see myself ever finding peace..." – P1, Survey*

> *"... by having an extra year of university you're going to have to burden the extra year of the cost of that entails. So it's a bit of a catch 22, because obviously you need it to get on, but then an extra year at the university's cost me like nearly twenty thousand*

pounds. And I'm like, I have to work all summer and stuff to help

support that." – P18, Interview

However, along those lines, the one means of gaining financial capital was that the Gateway year allowed many students to establish part-time work, relating to the 'ease in' structure of the Gateway year:

"I think having the gateway year is like a really good opportunity to

be able to work, because I feel like if I was doing the first year of

medicine right now, I would not have the time for any job." – P28,

Interview

Finally, there was almost an unconscious dichotomy that occurred while one participant reflected on economic experience, raising concerns about these students regards towards part-time work. Despite having to work, at times multiple jobs, one participant still felt that they were really at no disadvantage for having an additional year:

"So I know some people feel that they have to work, because they

have to like send money home and things like that. My personal

opinion is that if you manage your student finance and everything

okay, and you don't have other responsibilities, such as sending

money back home, you should be fine... I mean, I, in my first years, I

had 3 jobs. And now I just have a back job, but I didn't feel like I had

to do that, it's just so I could earn money to support myself in year

5 and 6, because of course, NHS give you less money. That's just

planning for the future." – P15, Interview

9.5.2.4   Gateway or Additional Gate to Social 'Capital'?

Social 'capital' often depends on specific social groups and can come in different forms, but this work focuses on two forms; bonding social capital which relates to benefits within a group, and bridging social capital which are benefits across different social groups. Despite being in an unfamiliar field of medicine when starting the Gateway year, it was rare that students reported feeling completely isolated,

because the structure supported strong bonding capital. Gateway staff connections were one of the largest sources of social support to students:

> *"The amount of support I received from staff on an academic, financial, and emotional level is something I haven't seen in any other education setting... thank you for being oh so considerate about each of your students circumstances and tending to your student's needs, as if they're human beings, not robots." – P10, Survey*

Some also attributed this connection to the typically small numbers of students on Gateway cohorts:

> *"... we're a smaller cohort, I feel like there's much more of a sense of us going to our lecturers to talk about any problems we have, because we have, we kind of have a more personal bond with them, almost because they know, each of us individually" – P6, Interview*

In addition to close relations with staff, within the Gateway year cohorts, there was also strong sense of belonging thanks to peers, also supporting bonding social capital:

> *"You [the gateway year] gave me friends for life. People who I wouldn't trade all the A*s in the world [for] and taught me so much about myself." – P11, Survey*

> *"... friendships with my mates, it has been dictated by the Gateway programme... we did everything together, so we had every single lecture or tutorial together, and we're pretty much together for the duration of the whole year, we kind of got really close as like, friends, and also kind of close as like colleagues as well... I've ended up joining societies with the same people, or going to go on trips, or placement." – P6, Interview*

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This stemmed from the constant contact, but also the sense that these peers were ideologically similar in a sense:

"... it was nice because everybody who was on it [the Gateway year] was from kind of similar backgrounds, widening access, those types of things. I think everybody was equal in that sense." – P2, Interview

However, on occasion, sense of perceived minority status, within this small group, could prove detrimental. When students felt they did not 'fit in' or 'get on' with their Gateway peers, this meant a lack of bonding social capital:

"... because it is widening access, there was a lot of, a lot of ethinic minorities. But that meant I was the only white person in my class... It was very clique-y. I was very much the outsider, of an outside group, as it were." – P15, Interview

Further, via modification of their entry, the ability to gain bridging social capital was greatly diminished. There was often a sense of lack of belonging in the wider field of the medical school, and an inability or lack of opportunity to gain bridging social capital:

"...because you are not a 'fresher' they [standard entry students] all have that 'coming to university' bonding experience together. You miss out of that, making you more of an outsider and setting you apart from the rest of the cohort." – P4, Survey

Many students also lamented at the lack of awareness and knowledge about their route to medicine via the Gateway from others, contributing to more sense of 'ingroups' (who understood) and 'outgroups' (who were misinformed):

"... like a lot of people were like, 'oh were you learning your ABCs stuff this week,' and it's like patronizing, to the point where you just kind of join in the joke, and be like, 'No I did my alphabet last week,' kind of thing. But like, by educating people about the [Gateway] year, I think that could really help with increased inclusivity from

other members of the medical school, and that includes staff." –
P18, Interview

"... you can see they're quite a clear divide between you know
[standard entry] and [gateway entry]... I don't even know if it's like,
it's on purpose... you know, we're just doing the same thing, I just
got to do another year of it. But I think it's, some people might not
understand it." – P12, Interview

On occasion, misinformation escalated, and manifested in the perception of
stigmatising views and microaggressions based on entry:

"I do think with the gateway year, it's kind of segregated from the
main pool. So I just, I just feel like this sort of stigma that because
we didn't get like the grades, that were necessary for the main
course, we're not as clever as them." – P29, Interview

"... in medical school, whenever I did perform well, I'd hear people
say, 'Oh well, it's because she did a [gateway] year. So, she already
knows all this.' And it just constantly... that constantly put me
down, because I've performed better." – P24, Interview

All the added elements of negative social capital attributed to the Gateway year was
in addition to the baseline 'otherness' students felt by being an underrepresented
student, due to their background:

"... you do feel a bit out of place sometimes and people are talking
about like their dad being like a cardiovascular surgeon, and you
can't relate to that, because my dad's a bus driver. And I felt very
out of sorts." – P11, Interview

"...pretending I was something I'm not. Whilst my peers were
spending their summers sunning themselves around the globe, I
was working. Weekends were spent doing my part time jobs, my
peers spent them hungover or playing for their sport teams. Now
I'm working, things are different. But not that different. My medic

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peers have houses, cares, dreams to head off to faraway lands just
to get some extra training under their belt. My non-medic peers are
starting families, getting mortgages and promotions. I'm in limbo. I
don't fit into either of these worlds... sustaining a lifestyle which
requires parental supplement just isn't doable for us; the
inbetweeners who fit nowhere." – P1, Survey

9.5.2.5 Confidence, Diversity, and Opportunity – The Best 'Capitals'?

As noted earlier, 'capital' can manifest in many forms, beyond economic and social. There exists symbolic capital that is based on 'status' in a field, as well as cultural capital, or the knowledge and traits to succeed in a particular field. While participants did not note the Gateway year as a positive form of symbolic capital in their medical education, they did describe how the Gateway year could help them foster some forms of cultural capital, such as confidence in being a medical student:

> *"[My gateway year] made me appreciate what I have to offer as an*
> *individual. Gave me the confidence and belief I belong." – P7,*
> *Survey*

This confidence as cultural capital developed in the Gateway year and beyond was often linked with 'habitus'; being confident not just in their abilities, but in their sense of self and identity:

> *"I've already like developed as a person and as a medical student...*
> *I've become a more confident person." – P32, Interview*

> *"But by actually being on placements, I feel like my identity has*
> *become a lot stronger, because, I can relate to patients on a*
> *different level... maybe because I can empathize more with this and*
> *that... people talk about their social situations a bit more, like*
> *financial difficulties they're having a bit more, and I suppose maybe*
> *because I understand the language of it, that has made me feel*
> *more confident, and more strong." – P11, Interview*

Another form of capital the Gateway specifically provided was opportunity. While, many participants believed something in their character and family support drove their aspirations to pursue medicine, the Gateway was key in access. Despite interest, many of these individuals could still not compete in the standard entry field, lacking symbolic and cultural capital via the benefits of attending high performing schools prior to applying to the Gateway year:

> *"... my college didn't really have anything to support med students... I had to arrange a mock interview myself, and they just kind of pulled questions off Google… But I think it definitely was self-drive more than anything, and I think my family as well... I've always wanted to do medicine and they've always been like really supportive of that... like my dad took me to all my interviews, and even open days, before that he went, you know, he drove me to all of that. Yeah, I think even though they didn't really know, you know, they've never been to uni[versity], so they weren't really sure of the whole application. But I think my family was a big driver in just, just knowing that they were there was quite a big support." –*
> *P12, Interview*

> *"... you're already against a brick wall from when you start, really, because everyone is like, 'Oh well you're not going to get in...'... my college wrote about, 'Oh, you're never going to get in… I've got no family in medicine. I have no family to ever done degrees or anything like that, but I always wanted to do it, from when I was small. But I never thought I'd be able to do it... I did work at like hospices and stuff, kind of trying to keep my toes in it. But it was more that I think my family kind of made giving a final push [to apply to medicine]... I wouldn't be where I am kind of without them being there for me'" – P2, Interview*

But, with its modification and access, the biggest form of capital given by the Gateway programme was opportunity, an actual spot on a medicine course:

"I am very lucky to be a Doctor, and without your [Gateway year] help I would never, ever have been able to achieve this... You [the Gateway year] were my opportunity to escape the certain future I would have been subjected to. You [the Gateway year] saved me from a mundane, run of the mill job." – P1, Survey

"It [the gateway year] was a lifeline, and I am grateful to [the] university for giving me a place." – P25, Survey

"... like a lot of the medicine cohort is taken up by people who have had really privileged upbringing- like I know so many people who have gone to private schools, and who had like loads of tuition, like coaching, to get them on to the course. And like, I didn't. I did it all by myself, just googling how to do an interview and stuff like that. So I do appreciate that. It's [the gateway year] like such an amazing opportunity." – P18, Interview

"I feel like there's so many students and there's so many people that I've met in my life, that have been so passionate about medicine, but haven't been in the right circumstance to be able to pursue it, and to be able to get in. And I don't think I could have made it to where I am now without having the opportunity..." – P14, Interview

This capital of opportunity created by the Gateway was not one way, however. Students also reflected that in being given a place, they, as underrepresented students, did have a lot to offer the field of medicine:

"... if we take the Gateway programme out of it, you can see that the [standard entry medicine] programme is not as diverse as it should be... And I'm glad the Gateway programme is there to help diversify that... obviously we're all being trained to be doctors, but it [diversity] encourages people to like appreciate other peoples like backgrounds and cultural differences, because, at the end of the

day, patients come from all over the world and from all different

kind of cultures... and having a diversified program also ensures

that when you're talking to your colleagues... you get to

understand the kind of struggles and also positives that people

have within themselves..." – P6, Interview

"They [gateway programmes] make medicine possibly more

accessible for some people who, ummm, either haven't exactly got

the grades or experience needed. It's very competitive. I think I

didn't realise kind of, kind of how sort of elitist medicine is, until I

integrated with the rest of the year, and so many other students,

their parent's doctors, or they went to private school. There's a

much higher proportion of that and I didn't even realise... that

gateway year provides opportunity for those people who don't

have family connections who are medics, who haven't had

necessarily the best education, or went to comprehensive school, it

just provides that accessibility." – P14, Interview

9.6   Discussion

This study highlights that for underrepresented students, modifications to admission criteria and initial curriculum, made in an attempt to better support and prepare, require a fine balance. Gateway years are successful in supporting matriculation routes, and there are numerous positive experiences and forms of capital they can generate. However, well intentioned curricula that do not consult with students can actually lead to the creation of additional challenges, as also demonstrated here. Further, there are some serious concerns around perpetuating disadvantage, highlighted in this work. And an unintended, but perhaps predictable, consequence of the Gateway year was the negative impact on economic capital. The segregation created by the different means of entry also created a deeper social capital divide for Gateway students. These elements will all be explored in the sections of this chapter discussion.

9.6.1   Gateway Years are Serving as Gateways

If one considers the purpose of Gateway years to offer a route to medicine that would not be a possibility for some underrepresented students (Curtis et al., 2014a; Garlick and Brown, 2008), there is quantitative evidence that demonstrates initial success in this goal (Curtis and Smith, 2020). The present study contributes qualitative evidence that Gateway years can be considered successful in this sense. This is particularly important in considering that based on student responses, many regarded the Gateway as their only "opportunity" to have a route into medicine. Further, as seen in the survey data from this work, only 41% of participants participated in some WP outreach scheme prior to applying to their Gateway year. This suggests that 59% of these students were not reached in some capacity prior to considering applying to medical school, and therefore 'missed out' on a myriad of opportunities that may have assisted them in gaining a standard entry spot to medicine. Even in considering those who did do WP activities, these still culminated in a pathway to a Gateway year as the only option for medical school entry. One participant went as far as to refer to the Gateway year as a "lifeline." This work thus provides qualitative evidence that Gateway years are serving as viable forms of gateways to medical education in the UK. As to the limitations of outreach this work highlights, these findings will be revisited in Chapter 10 (10.3.2), and considered in the context of the work from Chapter 7, that highlighted the potential for WP anatomy outreach work.

9.6.2   The 'Good' from Gateway Years

Gateway year experiences were not completely marred by negative issues. Many students expressed gratitude for the presence of supportive, dedicated staff, and chance to bond with similar peers. For some, this level of support and belonging was something they had never experienced in their education. This aligns with findings of other work in the field of WP that show how detrimental prior educational experiences can be a major inhibiting factor for WP-background individuals considering medical education (Fleming and Grace, 2014; McHarg et al., 2007; Alexander et al., 2021). In considering these studies, and the present work, the power of Gateways in offering a transformational and supportive educational

experience is seen. Being academically supported for this first time offered very positive social capital for students as they progressed through medicine.

There were also expressions of pride, held by Gateway students as being 'more diverse' than standard entry cohorts, linked with the belief that they might have greater empathy and clinical aptitude for working with a wider variety of patients. The Gateway year allowed them the opportunity to share their diverse perspectives with the field of medicine, and learn how to engage in these more, via culturally-mindful curriculum. However, it is not clear whether the Gateway year itself truly fostered this sense of pride, or if this was a natural growth experienced by the maturation of students once they became more familiar with the field of medical education. It may be the latter, as similar sentiments of pride have been expressed by underrepresented students in other studies, who perceived their differences to be an "empathetic" advantage (Beagan, 2005; Conway-Hicks and de Groot, 2019) . These works were conducted in systems of standard entry medicine, outside of the UK, suggesting that fostering pride might not be unique to Gateway years. Further investigation might shed light on whether Gateway years offer anything unique, and 'above', in terms of curriculum that support cultural competency. This type of curricula will be revisited in the overarching discussion (10.3.4).

9.6.3   And the 'Bad' and the 'Ugly' Sides of Gateway Year Matriculation

Despite the 'good' highlighted by this study, student participants also described their experiences as including plenty of 'bad' and 'ugly' ones, particularly when it came to considering economic capital and bridging social capital opportunities. The stress associated with financial concerns, particularly from later year students who noted the impact in their Year 6 and foundation training, was extremely high. The Gateway year also directly contributed to this, by lengthening medical education, even if by a year. Adding to economic challenges, this year of experience then altered the way that Gateway students felt they were perceived by other medical students from standard entry. Some experienced direct stigmatising comments, while others felt perhaps it was more of a perceived sense of an unwelcoming environment. But there were clear negative experiences, nonetheless.

These problems, though again, may not be unique to Gateway students, rather *intensified* by design aspects of the programme. Other studies of medical students who share characteristics with Gateway students, such as those first in their family to attend university, have demonstrated economic capital concerns are often looming (Brosnan et al., 2016; Bassett et al., 2019). Other work has also demonstrated how students from working-class or impoverished backgrounds often experience "everyday classism," or perceived commonplace feelings of isolation, disrespect, and stigma from other medical school peers, associated with socioeconomic divides, leading to a lack of "fitting in" (Beagan, 2005; Conway-Hicks and de Groot, 2019; Bassett et al., 2018). But, this work posits, based on participant experiences, that the addition of a Gateway year worsens these documented challenges of underrepresented groups in terms of economic and social capital. An extra year equates with extra time and money. A 'label' of otherness as a "Gateway" or "Year 0" student leads to direct and perceived comments about social status. These appear to be unavoidable negatives associated with this entry and progression routes in medical education. As such, considering the naming and language of Gateway years may prove helpful. Furthermore, structuring more financial support schemes and school or national-based bursaries may help add financial buffers for struggling students (Claridge and Ussher, 2019).

9.6.4   Notes on Interpreting the 'Good, Bad, and Ugly' Together

The findings explored in the previous sections highlight that there are specific risks and costs, as well as benefits, associated with Gateway programmes. Despite their increased roll-out, there remains many unanswered questions about whether this form of WA is the most effective and efficient way of increasing student diversity. However, there are several key points identified in these data that curricular designers and policy makers should consider, including: costs, academic content, course details, and the power of peer and staff support.

For Gateway students, cost in both time and money, are only outweighed by the perception that this was students only or best chance to achieve a medical degree. Such costs could be ameliorated by providing more robust financial aid and support throughout the medical degree for Gateway students. Additionally, the findings pose

the question, is an entire year required? Particularly when students cited minimal perceived content-related academic benefit to Gateway programmes. Perhaps what students need are the non-academic capital gains that could be provided via a shorter-term summer school or intensive model could distil the positive aspects of the Gateway year to a less stigmatising, more affordable option. Short-term intensive 'boot camp' programmes exist for many postgraduate medicine programmes, particularly in North America, and are posited to be a potential impactful way to smooth educational transitions (Busing et al., 2018), although this language can be regarded as problematic and militaristic. Still, in the wider STEM field, such intensive short term programs have demonstrated increased retention for students in undergraduate biology courses (Wischusen et al., 2011). Exploring these models in the context of widening participation to medical education could prove fruitful in not just promoting diversification, but retention, success, and belonging.

Furthermore, closer attention should be paid to student feedback relating to content of existing Gateway years. This may even warrant national-level work to try and create a more standardised curriculum for Gateway years. Still, even more 'local' feedback on fine details like the name of a programme, or the building/classrooms used for instructional activities, should be taken seriously by programme developers. These subtle and practical decisions can be huge in perpetuating everyday classism and stigma.

Lastly, Gateway programmes should be commended on the power of peer support and dedicated staff they provide. Human connections were the number one positive aspect for these students, both in their Gateway year, and as they progressed. Encouraging these social connections across medical schools is key, so that bridging social capital can be more equal with bonding social capital.

9.6.5 Bourdieu's Theory of Practice to Strengthen Research

Finally, the study presented in this chapter not only focused on the lived experienced of Gateway year participants, but used a specific theoretical framework to refine interpretations of the results. As with previous work in medical education (Brosnan et al., 2016; Balmer et al., 2015), the application Bourdieu's theory (Harker et al.,

2016) was key in framing these lived experiences of Gateway students. The present work builds on Bourdieusian application by not just considering capital, but all three primary components of Bourdieu's theory of practice (Bourdieu, 1977), as each component influences and is influenced by the others. This was particularly insightful for this Gateway work, as the addition of the extra year creates a unique 'field' element, impacting students' entire medical school experience. Figure 13, as introduced here and presented on the following page, draws on other's interpretations of Bourdieusian theory in medical education (Varpio and Albert, 2013), and depicts this theoretical framework as a 'machine' of practice or progression, to demonstrate the interactional component, and influence of field.

Starting at the lower left-hand corner of Figure 13, individuals come from their own pre-medical experience, with its own sets of Bourdieusian cogs. These cogs have worked well together to generate enough 'power' for the individual to progress an enter medical education- all Gateway students have 'beat the odds' and are studying medicine. Field is first, as the uniqueness of Gateway as a field, influences the rest of their medical school experience. Given the student maintains or gains enough power, they will eventually progress into medical practice as a doctor, another collection of cogs shown to the right of the figure.

Additionally, one can also imagine 'trap doors' to each of the practice 'machines,' as shown in the primary example of medical education. If an individual cannot gain enough power to progress, they will be forced out the trap door, so to speak. A consideration and limitation of the present work is that its participants are only students who continue to hold power- none have fallen through 'trap doors' in their medical journey. Although, this is a potential direction for future research. The notion of 'in-group' perspectives will be revisited, in the limitations of this doctoral work (10.5.3).

Figure 13: Depiction of the Application of Bourdieusian Theory in Interpreting Findings
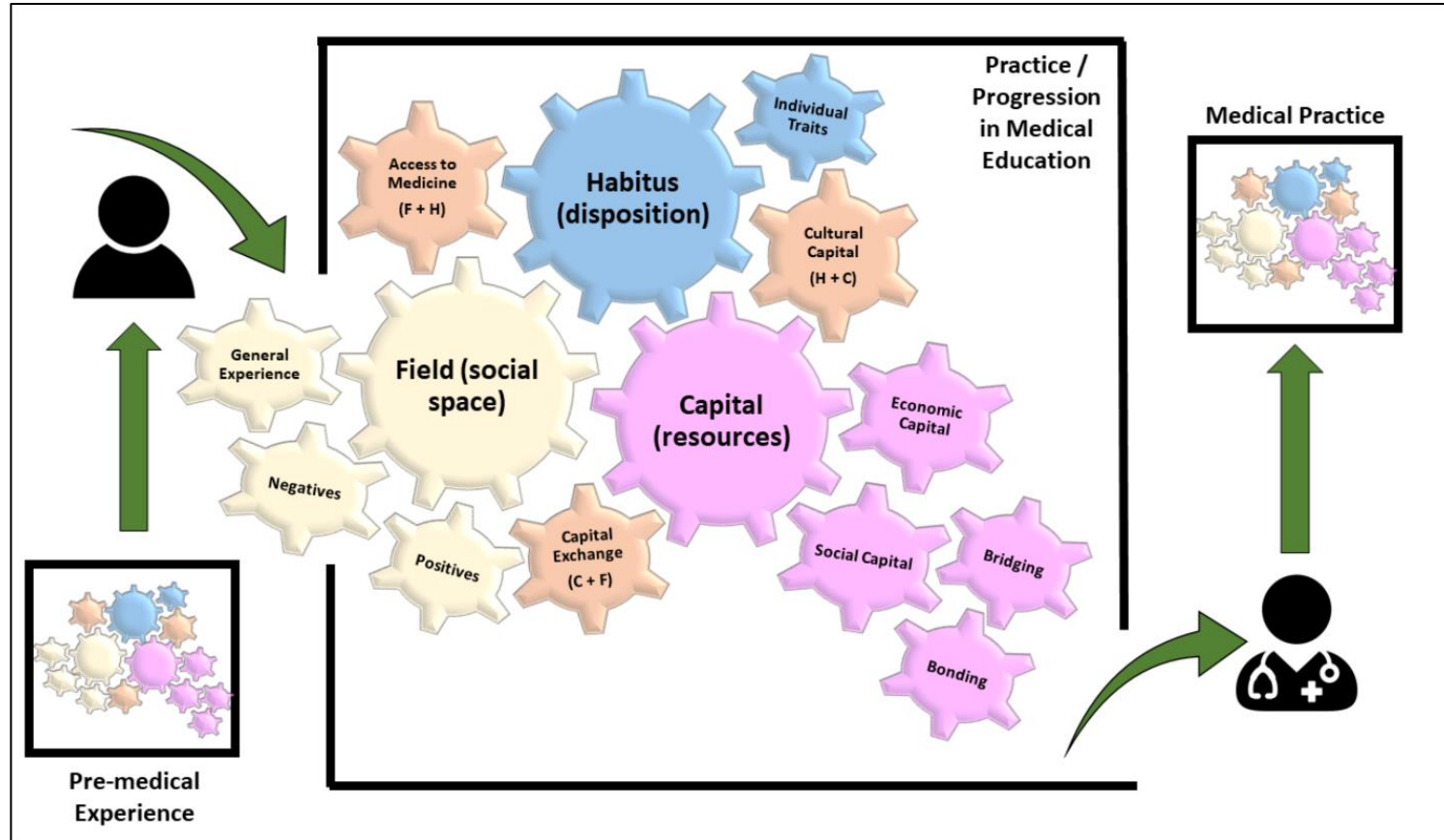

Figure 13: The theoretical framework employed in the present study, drawing on Bourdieu's work, interpreted as a system of cogs to generate power in the field of medical education. Cogs may be different sizes or work differently in different environments, given what a setting values as 'power.' Here, cogs represent key findings and interpretations from this work.

Using this model to help map student feedback or stakeholder considerations may prove beneficial in the design of programmes directed at supporting underrepresented populations, or other work relating to notions of power struggles. Indeed, it was useful in the mapping of data in the present work, particularly in late stages of thematic analysis. For example, if a programme is targeted at increasing pre-medical admissions test scores, one might consider which cogs may be lacking, or creating dissonance within progression. Perhaps, economic capital, for example, is the cog that generates the most difficulty; students who cannot afford to pay to take an exam will never be able to progress to the next 'box' of education and training. Means to decrease the dissonance of this cog could then be explored, having identified it as the key problem in the 'machine.'

9.6.6   Limitations

This study offers the first multi-institutional, and one of the first qualitative studies about Gateway programmes. This study was limited to five institutions, and there may be a wider range of views expressed by students at different programmes. However, given the heterogeneity in establishment, size, and teaching approach of the five included medical schools, the features described here may be reasonably applied to other Gateway programmes. Still, the potential importance of specific medical school 'field' and culture (Brosnan, 2010; Alexander et al., 2017), should not be ignored.

Additionally, it is worth noting that there was also greater participation in the present work from those early on in their medical education, which may have an effect on the described experiences. Research suggests a stronger 'medical habitus' is not formed until the clinical years of medical education, or even postgraduate training (Luke, 2007). Still, trainees in the present work commented on strong aspects of professional identity, related to their diverse background, but not necessarily affected by their Gateway experience. Again, this raises questions on whether this was related to academic maturity or distance in time since their Gateway year direct experience. As such, longitudinal work may be of interest, to understand experience of cohorts as they progress. This could also be compared to

longitudinal, quantitative measurements, to gain an overall better picture of progression.

9.6.7   Directions for Future Research

As highlighted above, the theoretical components of this work could be applied in future work of underrepresented and marginalised groups, to better highlight strengths and limitations of support systems. Also noted in the above 'trap door' metaphor, the present work only had participants who had successfully entered and or remained in medical education. As highlighted in recent work, Gateway students tend to have slightly higher attrition rates compared to standard entry medicine students (Curtis and Smith, 2020) . Repeating the method described here, but with students who did not progress, might help to identify the reasons Gateway students may be less likely to progress, and better means to support them.

Additionally, it is recommended that more evaluations are done, to identify and compare the costs and benefits of Gateway programmes to alternative approaches. This could be quantitative, observational work, as well as further qualitative work from the perspective of staff and faculty. In terms of the present work, how the present chapter relates to the previous work with faculty and staff (Chapter 8), will be considered in the overarching discussion. Ideally, there should also be future evaluative work aimed specifically at understanding the economic costs, both to institutions and students, to account for direct and indirect costs. As highlighted here, the economic capital costs to students were large, at many stages of their career, and this should not be dismissed. Financial obligations and constraints can play a role in career opportunity, including specialty and practice selection (O'Connell et al., 2018), which is particularly important in considering the healthcare utilitarian discourse to support WP initiatives (as noted in Chapter 3, section 3.3.2.2).

9.7   Chapter Summary

This study highlighted some key benefits of Gateway to medicine programs, as implemented in the UK. These included, importantly, the opportunity to study medicine for individuals unlikely to access medical school via standard entry courses, as well as additional support and a more graduated introduction to university

education. But there are important social and economic costs to this approach to widening access. The findings suggest that without regard for student voice and appreciation of underrepresented lived experiences, widening access and diversity initiatives will always be limited by also widening the gateway to debt and stigma.

In the next chapter of this thesis, this doctoral work considers the findings of this study, as well as those in the previous results chapters.

Chapter 10: Overarching Discussion

10.1 Chapter Introduction

This doctoral work set out specific aims (detailed in Chapter 5, 5.3) designed to contribute original knowledge to the field, related to widening participation in medical education. These broad aims included: exploring generalisable views on the function of outreach, understanding facilitator perspectives on WP-focussed modifications to selection and curriculum in medical schools, and exploring the lived experiences of students progressing through medicine via specific WP-routes. Each of the previous results chapters (Chapters 7-9), addressed each of these aims, respectively. Each chapter also answered more specific research questions related to these aims, and findings were discussed within the scope of each study.

The aims of this doctoral work also included consideration for the intersect of outreach, selection, and retention in supporting WP in medical education. This aim included interpreting the roles of these mechanisms in the broader scheme of diversity discourses and action in the field, as illustrated in Chapter 5 via the conceptual framework (5.2). Here, this 'Overarching Discussion' chapter aims to address this final aim of the thesis, integrating key findings from each of the studies in this doctoral work, for overall interpretation and identification of implications for the field.

As such, this chapter first revisits the aims and questions of each of the included studies, reiterating key findings. These 'results' are then mapped onto the conceptual model of this doctoral work, to show what gaps were addressed, and how findings can be interpreted together, framed by WP- and diversity-discourses. Implications from these combined interpretations are then discussed, moving to specific recommendations for practice and policy within medical education. A number of limitations for this doctoral work as a whole are then discussed, in addition to future directions for work in this field. Finally, the chapter is summarised prior to introducing the final conclusion chapter of the thesis.

10.2   Revisiting Thesis Aims & Questions

Each results chapter in this thesis was associated with a type of WP activity, but with specific mechanisms, study populations, and research questions. There are key findings that can be synthesised from these individual chapters, that were discussed in greater details in the respective chapters. Still, for clarity's sake, Table 14, Table 15, and Table 16, across the following pages, present all of these study elements and key findings, in similar organisation. Understanding the key findings of this doctoral work is key in the subsequent interpretation of the work. The questions and findings have also been labelled, with Outreach – O, Selection – S, and Retention – R. This is for ease of communication in linking key findings from questions to the subsequent interpretations and implications from this work.

In revisiting the aims, it is also important here to reflect on whether this doctoral work did or did not address the general aims that were presented in Chapter 5, and guided all subsequent work. First, considering outreach, the aim was to explore generalisable views on outreach, and its role in supporting widening participation. Chapter 7's work accomplishes this, although being a more focus on anatomy outreach, still considers generalisable views on such outreach, particularly in supporting WP. The second aim of this thesis was to understand facilitator perspectives in modifications to selection and curriculum, as a means of widening participation. This aim was, perhaps, not as directly addressed as the preceding one. Chapter 8 focused on facilitator perspectives on Gateway years, which do modify selection and curriculum, aligning with the aims set out. However, the specific aims for this work ultimately resulted in more broad views on Gateway year implementation; while both admissions tutors and module leads participated, they did not comment specifically on their selection and curricular modifications. This misalignment is not to say that the findings from Chapter 8 are not insightful or important contributions to knowledge- they are. But, in future directions of this work, as described in Chapter 8 and later in this chapter, more specific lines of questioning around selection and curriculum is warranted. Finally, the third aim was to explore the lived experience of students who progress through medical education via specialised widening participation routes; Chapter 9 definitively achieves this aim

with its qualitative work with current and former Gateway year students. And finally, the last aim was: consider the intersect of outreach, selection, and progression/retention in supporting widening participation that aligns and achieves diversity discourses. This final chapter addresses this aim, in the synthesis of findings across the three studies together.

Table 14: Summary of Study Elements, Aims, Questions, and Findings for Outreach Work

General WP Mechanism	Specific WP Mechanism (and Study Population)	General Aim	Research Questions	Key Findings
Outreach	Anatomy outreach (facilitators)	Understand how anatomy outreach acts as a social phenomenon that can support WP	Does anatomy add anything 'special' to health sciences outreach? (O1)	Yes – the unifying experience of anatomy (everyone has a body) can allow for connection regardless of (WP-) background (O1)
			How do facilitators understand the purpose of anatomy outreach in supporting diversification and widening participation to medicine and health sciences education? (O2)	The purpose is about insight and encouragement, not raising aspirations or addressing knowledge (deficits) (O2)
			What mechanisms best support, or challenge, the ability of academics to conduct anatomy outreach? (O3)	Beyond practical elements and enthusiasm, strong community partnerships can support; the challenge is appraisal, and understanding / demonstrating 'worth' (O3)
			Are there specific drivers that lead individuals to commit to outreach as service work? (O4)	No singular shared motivator; individuals tend to have highly personal or professional drivers (O4)
			Given the current educational climate (due to the coronavirus pandemic), how has COVID-19 affected anatomy outreach? (O5)	General educational and societal concerns also apply to outreach; near complete halt due to pandemic (O5)

Table 15: Summary of Study Elements, Aims, Questions, and Findings for NPT Work

General WP Mechanism	Specific WP Mechanism (and Study Population)	General Aim	Research Questions	Key Findings
Selection (Pipeline & Gateways)	Gateway to Medicine years (medical school faculty and staff)	Explore how modifications to selection and curriculum are implemented by medical schools	Do staff and faculty within the study institution consider the Gateway Year to be implemented efficiently and effectively? (S1)	Generally, yes; it is happening with students progressing, but not without concerns (S1)
			Are there shared views on the processes of implementation of the Gateway year, including (S2)?	Yes, including (S2):
			The meaning and purpose that led to the addition of the Gateway year to the medical school? (S2a)	There is general shared meaning about Gateway years supporting WP, but subtle differences in interpretation (S2a)
			The commitments of individuals and groups in supporting the Gateway year? (S2b)	There is general commitment, though concerns about resourcing, training, and workload models (S2b)
			The effort required from individuals and groups to sustain the Gateway year? (S2c)	There is high commitment and effort from those directly involved, but less support or awareness in the medical school as a whole (S2c)
			Comprehension of the impact of the Gateway year within the medical school? (S2d)	The 'impact' is still ill-defined, with general updates limited to small circles of those most directly involved (S2d)
			Can NPT be used to effectively research and understand specific medical education programmes? (S3)	Yes; NPT can be used successfully in a medical education setting, supporting methodological borrowing in the field of medical education (S3)

Table 16: Summary of Study Elements, Aims, Questions, and Findings for Student Experience Work

General WP Mechanism	Specific WP Mechanism (and Study Population)	General Aim	Research Questions	Key Findings
Retention (Pipeline & Gateways)	Gateway to Medicine years (student 'participants')	Explore lived experiences of students progressing through medical education via WP routes	What are the perceptions on the structure and function of the Gateway year itself? (R1)	Curricula is frequent regarded as too 'basic' but can be beneficial if including anatomy or in later years of medical school; clinical exposure is also good; the year can be organised in an isolating way (R1)
			What are the perceived advantages and disadvantages of matriculating via a Gateway year? (R2)	It (positively) provides an 'ease in' to medical school with excellent staff and peer support; it (negatively) can create 'otherness', and perpetuate financial concerns (via the added year of costs) (R2)
			Does stigmatisation exist for students who matriculate via these specialised WP routes? (R3)	Yes, although typically mild to moderate classist microaggressions; perceived stigma dissipates with progression and qualification (R3)
			What are the drivers that lead to students matriculating to medicine via Gateway years? (R4)	Opportunity; approximately half of students had no outreach experiences, and had no other choice in medical entry (either due to low grades, or non-competitive application in other selection criteria) (R4)

10.2.1 Framing Thesis Findings by Paradigmatic Approaches

As noted in Chapter 6 (6.7), the specific paradigms in which research is conducted is particularly important for clearly communicating research findings. As such, before considering the combined findings from this work, it is important to revisit the paradigmatic lens that 'shades' or 'illuminates' these interpretations. First, given the strong influence of pragmatism in this work, many of the above 'Key Findings'

presented in Tables 14-16 have very practical implications. They highlight problems, and focus on solutions, derived directly by the participants of the various works. Indeed, the subsequent 'implications' section of this chapter (10.3), also focused on key recommendations, that include practice and policy. A work that was not so grounded in pragmatism may have been focused more on philosophical or theoretical contributions to knowledge, rather than these practical contributions. This is not to say that either of these approaches or interpretations is superior to other; rather, here the goal is to clearly communicate the way this thesis concludes.

But pragmatism was not the only paradigmatic influence on this work. Chapter 6 also details the role of critical theory as an influence on this work, though not the dominant, guiding paradigm. Critical theory was most influential in the work in Chapter 9, focusing on lived experiences of students from WP backgrounds, including notions of stigma, otherness, and touching on capital and habitus, and the power these hold in progressing in the field of medical education. This is elaborated on in a below section (10.3.4) that considers the challenges in understanding WP not just as outreach or selection, but also as progression and retention. Additionally, the influence of critical theory is a lens applied beyond this student-oriented element in the below discussion of interpretations of the entirety of this work. Of note, one interpretation (10.3.3) considers systemic inequities that WP work can create for those who engage in; these perspectives, while not focussing explicitly on discourses, do present unique views on underrepresentation and how it can be leveraged in academic systems, aligning with critical theory perspectives (Paradis et al., 2020).

10.3 Key Interpretations from Combined Thesis Findings

10.3.1 Re-Framing the Findings using the Widening Participation Conceptual Framework

In order to best interpret the findings from the three parts of this doctoral work, while framing them in the context of the wider field, the findings were mapped onto the conceptual framework that was presented in Chapter 5 (5.2). Figure 14, presented here, illustrates the framework, with linking key findings to 'themes' of interpretation. This version of the model also illustrates how the findings are linked to various elements of the framework. These themes will each be discussed and

considered in terms of broader literature in the field, below. It is worth noting that the only two findings that were not mapped onto the framework are related to the implications of COVID-19 on outreach (O5), and how NPT may be used in medical education research (S5). These findings, while providing useful insights, relate less directly to the conceptual model for WP, and as such are discussed in other areas of this chapter (10.4.2), and the subsequent chapter (11.2.1), where methodological contributions are described.

Figure 14: Interpreting Key Findings Using the WP Conceptual Model
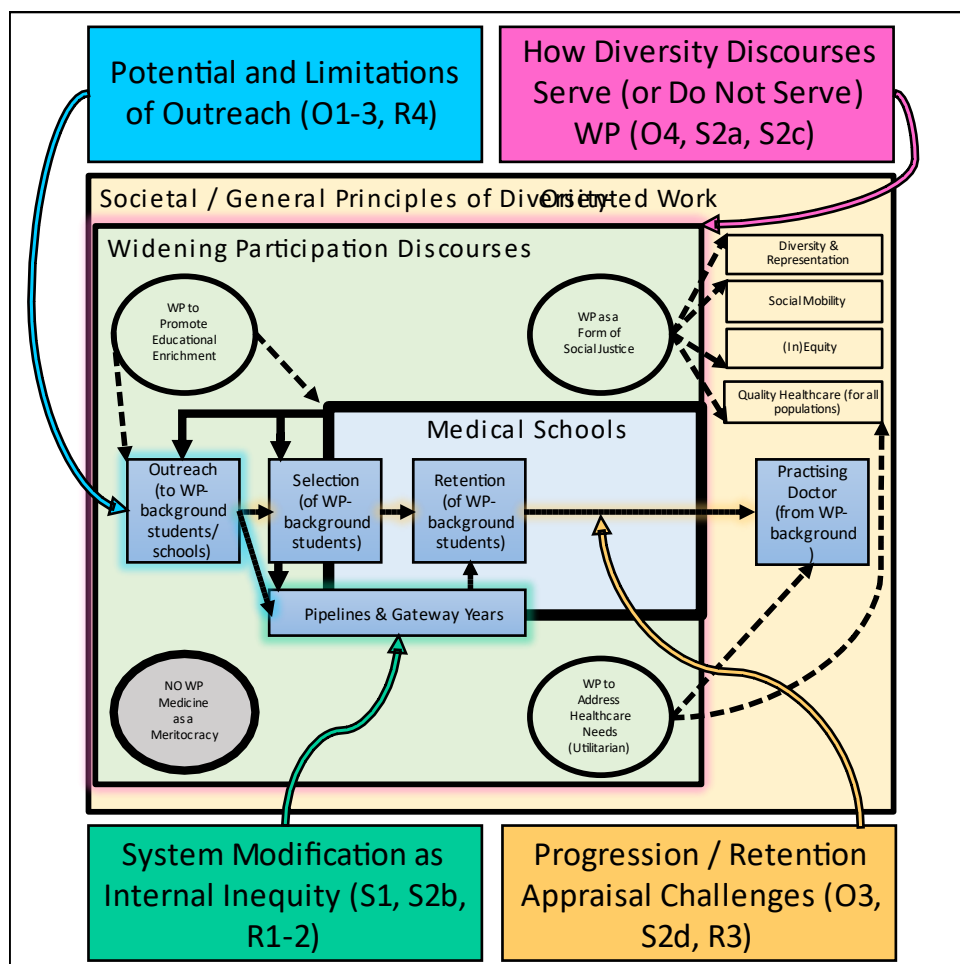
Figure 14: The conceptual model illustrated in Chapter 5 (5.2) is shown here with the addition of the major themes of findings, as well as associated findings from individual studies that contributed to these. The key findings are categorised as: Potential and Limitations of Outreach, System Modification as Internal Inequity, Progression / Retention Appraisal Challenges, and How Diversity Discourses Serve (or Do Not Serve) WP. Each of these will be discussed in detail below.

10.3.2 The Potential and Limitations of Outreach

Outreach has been posited to be perhaps one of the most powerful mechanisms of WP (McLachlan, 2005). Findings from this work add to evidence that outreach is a

powerful tool, but has distinct limitations. Naturally, the findings related to this interpretation theme are largely derived from the anatomy outreach work of this thesis (O1-3, Chapter 7), but were also supported by data from student experiences (R4, Chapter 9).

Particularly when outreach focuses on 'universal' experiences, as participants stated anatomy outreach does, it can allow for human connection regardless of background, including WP-background (O1). This human connection can then be used to foster and encourage individuals who may interested in pursuing HE science routes, like medical education (O2). This focus on insight and encouragement (O2), and less about knowledge, is potentially a powerful tool to move outreach away from perpetuating deficit models of education. As noted previously, these 'deficit' views of outreach are outdated (Alexander et al., 2019), and there have been calls to move outreach beyond the common theme of 'raising aspirations' to more tangible, personal, and empowering narratives (Southgate et al., 2015; Robb et al., 2007). Anatomy outreach, specifically, may be a valuable means to further outreach in this capacity (Taylor et al., 2018). Via the unique curricular approaches anatomy outreachers identified, the model synthesised from this work could be used to bolster other STEM-related outreach programmes, including for medical education.

However, while this work does support the potential of outreach, it would be remiss to not also recognise the limitations of this branch of WP. Such limitations were identified in this work. Notably, data from the student experiences in Chapter 9 showed that the Gateway year was the only opportunity many students had to pursue medical education (R4). Nearly half of all participants were unaware of any outreach opportunities prior to applying to the Gateway year. And those that had participated in forms of outreach, like summer schools or mentoring schemes, still regarded the Gateway year as their only option to matriculate to medical school, whether due to academic barriers or application gaps.

Findings from this work align with the data that suggests there are 'cold spots' in outreach, where certain areas and schools are still not being served (Garrud and Owen, 2018; White, 2016). While efforts are being made to address this, as the

present data indicate, it still may not be 'enough.' There are still clear barriers to application and matriculation; however, the findings from the present work suggests the disparity in application opportunity is not related to 'breaking' with working class identity of students which previous work has suggested (Mathers and Parry, 2009; Greenhalgh et al., 2004), as much as it is a result of structural barriers. As such, outreach initiatives in the future should not just be critical of language used to promote application, but focus on providing actual resources or capital to students (Nicholson and Cleland, 2017), rather than simply focusing on attitudes and motivations.

But until the application and academic disparities of selection that have been noted in the literature (De Freitas et al., 2021; McManus et al., 2013c) are seriously addressed, possibly via expansion of contextual admissions (Mwandigha et al., 2018; Kumwenda et al., 2017), there needs to be 'safety nets' for WP students to have medical education opportunities. In the UK, this supports the continued function of Gateway to Medicine years, and even the recent expansion in the number of these types of programmes, despite their small intakes (Medical Schools Council, 2019b). Elsewhere around the world, other pipeline programmes may also present the opportunity for more focused forms of support (Martos et al., 2017), to help secure paths from outreach to selection (Dueñas et al., 2021). This position of Gateway years as safety nets will be revisited later in this chapter (10.4.4).

10.3.3 System Modification as Internal Inequity

As noted in Chapter 8 (8.7.1), any form of innovation or change to the system of medical education requires intensive resourcing. The present work confirmed that WP changes are no different. The NPT work in particular highlighted that while a Gateway year was being implemented 'successfully' (S1), there were moderate concerns about the resourcing, training, and workload models in the medical school to sufficiently support implementation, without overly stressing individuals implementing the year (S2b). Even well over a year into implementation, concerns about resourcing had persisted. This raises concerns about sustainability of such programmes, although it should be noted that some medical schools have been running Gateway years for nearly two decades (Curtis and Smith, 2020), with no

evidence produced of serious implementation challenges. This suggests that ease and normalisation of running intensive WP programmes may occur naturally over time.

It is also worth noting that such resource-intensive WP modifications to the medical education system can be highly beneficial to the students they 'serve', thus providing a counter to the challenges of the work. This was demonstrated in this doctoral work, via students expressing their gratitude for the usefulness of anatomy and clinical curricula of their Gateway years (R1), and appreciation for the high level of support provided by medical school staff (R2). This student view from the retention work provides alternative perspective to the staff views of the selection work – while the work to modify a system may be immense, perhaps the outcomes in terms of student progression makes it 'worth it.'

And yet, while this doctoral work presents both 'sides' of this story for faculty and staff investment in WP, questions of 'equity' in this field remain. Drawing on wider diversity-oriented literature, similar concerns about trying to achieve internal forms of equity are also raised. The 'minority tax', sometimes referred to as 'cultural taxation', is a term that is frequently used in conversations around racial and ethnic diversity (Rodríguez et al., 2015; Hirshfield and Joseph, 2012). This concept posits that minoritised individuals are often placed with more responsibilities related to trying to improve EDI efforts, compared to non-minoritised individuals, thus marginalising already marginalised groups by trying to promote bottom-up interventions. These added responsibilities may be associated with hypervisibility, requests for more uncompensated work, or additional mentorship or committee service activities (Gewin, 2020). However, these inequitably ascribed responsibilities can be an additional tax on those who may already possess more structural challenges, resulting in more stress and isolation (Campbell and Rodríguez, 2019; Trejo, 2020). And particularly in academic systems, where teaching and scholarship roles might not hold as much intrinsic 'value' or capital as research or clinical activities (Fisher et al., 2017; Carr et al., 2021), the addition of these tasks to support WP and diversity can perpetuate systemic issues for minoritised individuals. Minority taxes can be complicated further by intersecting identities that are marginalised in

different ways (Athena Swan, 2020); for example, the burdens placed on Black women in academic medicine, to promote gender *and* racial inclusivity, not just one or the other (Hirshfield and Joseph, 2012).

The present work draws parallels between the minority tax and the work that faculty and staff often put into WP-oriented activities, resulting in internal inequity, or lack of fairness in medical schools, that this doctoral work describes as the 'widening participation tax'. This is not an established term in the field, rather a novel idea developed directly by the author of this thesis, and its work; this is further described in Table 17, on the next page. As noted in both Chapter 7 and 8, the efforts applied by academics to support WP-programmes can be immense. There can be a fair amount of stress with aligning WP activities with other workload demands, such as teaching and research, and there were questions about internal 'recognition' of this type of work. But individuals continue to commit to WP work because they *believe* in it, and it aligns with personal or professional missions about what is just, and what health professions fields need. But this contributes to the WP tax: an extra and perhaps inequitable workload for individuals who 'believe' in WP, while others within medical school systems may simply opt to not dedicate their time to such activities. And while not directly identified in this doctoral work, this WP tax may also exist in student bodies; WP-background individuals may feel obligated to volunteer for outreach and selection activities that they benefitted from, while non-WP-background peers pursue other professional development activities.

Table 17: Definition and Example of the Term 'WP Tax' (coined by Dueñas, 2021)

Term	Definition	Example
Widening Participation Tax (WP Tax)	Extrapolated from the term(s) minority tax / cultural taxation; the WP tax is the unfair onus to manage / coordinate WP activities on some individuals, instead of widely considering this as a responsibility of all faculty and staff	An academic who achieved their higher education degree via a widening participation volunteers to create and coordinate an outreach programme at their current institution. However, when it is time to be considered for promotion, a peer who dedicated more time to research (rather than service) is promoted over the WP-background individual. Still, the academic continues to be called on by senior leadership to oversee new forms of WP programmes.

However, given that greater diversity likely benefits all (Antonio et al., 2004; Murphy et al., 2020; Whitla et al., 2003; Guiton et al., 2007; Morrison and Grbic, 2015), it raises the question – should supporting WP and EDI be a part of every individual's workload in medical education? As more medical schools clearly adopt commitments to EDI, at least in public statements (Carnes et al., 2019), addressing how to make WP system modifications a goal for all, and thus an equitable 'burden', may be key to the success of such mechanisms and the individuals that support them. However, it is important to note that this concept of the WP tax still denotes level of privilege at the individual level. Unlike with the minority tax, which can be associated with visible diversity, commitment to WP activities may be more initially optional than other responsibilities and requests place on minoritised individuals.

While this notion of the WP-tax was identified in this research as an individual-level issue, it could also be extrapolated to apply to more macro social levels. WP issues link back to larger societal issues, particularly in the UK, this surrounds certain regions having less access to healthcare services, especially in certain specialties such as general practice (Barber et al., 2018). Some posit that medical schools have social responsibility for considering these healthcare needs (Rourke, 2013). However, this notion of social accountability is open to interpretation, and may result in inequitable responsibility placed on some schools, who see WP as part of their mission statement or inception (Howe et al., 2004), whereas other schools elect not to support WP as widely (Nicholson and Cleland, 2015). And particularly in a system where position in national university ranking systems may be negatively affected by entry standards, such as lower admissions grades (Johnes, 2018), universities with low sense of local social responsibility may have even less motivation to consider enacting more WP mechanisms, particularly for selection. In a sense, this perpetuates inequity across schools in the system of medical education. In the present system, medical schools are expected to take responsibility, and also 'foot the bill' so to speak, for enacting WP programmes in local regions, despite the societal benefits. And while there might be some programmes and initiatives coordinated at the national level (The Sutton Trust, 2021; Medical Schools Council,

2018c), there should be clearer delineation around WP goals amongst all medical schools. Broader questions, such as who benefits and who pays for WP need to be considered to address inequity in the wider system. To truly address these concerns at a societal level may require more involvement from NHS bodies; given that one of the key arguments for WP and WA is the benefit of a more diverse group of medical graduates, these systemic issues fall into the purview of the NHS. One way this might be done is using the Clinical Commissioning Groups (CCGs), responsible for planning health services in local regions across the NHS, to also consider WP and WA, and perhaps help with costs to alleviate some burdens from medical schools, and thus medical school staff. However, this suggestion may prove challenging to implement, given budget constraints of CCGs, and the challenges they have had in specifically addressing health inequalities (Regmi and Mudyarabikwa, 2020). Still, considering the downstream benefits WP and WA have, the NHS and MSC, not just schools and individuals, should endeavour to make progression mechanisms a higher priority.

10.3.4 Progression, Retention, and Attrition Appraisal Challenges

Chapter 9 of this doctoral work specifically aimed to investigate progression and retention as a facet of WP, from the student lived experience perspective. However, all components of this thesis highlighted the challenges in 'appraising' and truly understanding the progression of WP-background students. In the outreach work, one of the key challenges highlighted was how to best measure impact of outreach (O3); given the psychosocial complexities, its challenging to demonstrate whether outreach interventions are key drivers for WP-background students pursing medical education. And, as highlighted in Chapter 8, even when WP-background students enter medical education systems, updates about their progression are not always circulated widely to relevant parties within a medical school (S2d). Finally, when asking students about their progression, the work from Chapter 9 highlighted some concerning findings (R3). Many students perceived mild to moderate microaggressions grounded in classism. Indeed, these perceptions seemed to be directly associated with their Gateway year, suggesting that had these students been admitted via standard entry with contextual admissions, some of this stigma could

have been ameliorated. Although, positively, comments like this seemed to dissipate over time, and upon achieving the ultimate medical qualification, students cited more pride in their background, than stigmatisation. Still, this only speaks to the experiences of those that progressed and had a 'positive' outcome in the system, and may not reflect fully experiences of all students via these routes, via the study recruitment and self-selection; this point will be revisited below, in the limitations section (10.5.3).

These findings align with broader WP work, that describes the challenges of 'tracking' student progression, and highlight some of the negative experiences that low SEC students can face in the elite system of medical education (Apampa et al., 2019; Beagan, 2005). However, solutions to these issues are still withstanding. Based on the present work, perhaps adoption and promotion of 'good faith' and altruistic mentalities could improve the sense of outreach appraisal. As suggested by individuals who facilitated anatomy outreach, altruism might be the actual goal or measure for outreach, given the likely issues of longitudinal student tracking. However, this may require a field paradigm shift from post-positivist grounded views (Young and Ryan, 2020; Taylor and Medina, 2011), to philosophical and educational perspectives that consider that perhaps not everything that has value can be measured, and that not everything measurable has value (Bache, 2003). Being more comfortable with this outlook in the field of medical education might support outreach that 'reaches' widely for the sake of potential educational and social enrichment, not any strict numerical production of medical students.

As for the challenges admitted WP-students face, again, a focus on educational enrichment, and away from deficit models, may be a potential solution. The students interviewed in the retention aspect of this work often attributed experienced microaggressions not necessarily to malice of peers and medical school staff, but rather to ignorance, or lack of understanding. As such, educational enrichment opportunities for not just WP-background students, but for all students and staff of medical school staff may be key. Some medical schools, particularly in North American countries (Guerra and Kurtz, 2017; Gustafson and Reitmanova, 2010; DallaPiazza et al., 2020; Miller and Green, 2007) but also in non-Western regions (Ho

et al., 2008), include 'cultural competency' training or curricula, which may align with the goals of a WP-considerate curriculum for better inclusionary practices. Cultural competency, or cultural humility, refer to the behaviours, attitudes, or actions that support individuals in working in cross-cultural situations, beyond one's own cultural perspective (Deliz et al., 2020; Chun, 2010). However, recent review in the work in this field (Deliz et al., 2020) suggests there is a way to go in using such cultural competency interventions with educational rigour in medical education.

Indeed, the systematic review work from Deliz and colleagues highlight some concerns around cultural competency training in medical education, particularly in the UK. Of the 154 included, only a small proportion (six articles) specifically addressed issues relating to socioeconomic status; none of these studies originated in the UK. Of the 56 more 'general' focus articles, only two describe programmes in the UK, one broadly on cultural diversity (Hawthorne et al., 2009) and the other one on local community needs and diverse populations (Ewart and Sandars, 2006). These review findings suggest that there is a large gap in cultural competency training and curricula in UK medical education, particularly for the unique societal needs, relating to understanding a greater range of SEC. It is worth noting that it is highly possible more curricular models for cultural competency training exist in UK medical schools, but perhaps have not been critically examined as educational scholarship, and therefore would not be identified in a review. Still, this then contributes to a lack of general shared knowledge, and again, supports the notion that UK medical education could use more rigour and evidence-base for these cultural competency approaches.

Of note with this call for improved rigour, it has been suggested that such curricula should be structured around theoretical frameworks to structure and organise learning in a meaningful and non-stereotyping way (Crandall et al., 2003; Dao et al., 2017). Yet, this thesis worked demonstrated in its novel methodological borrowing for the NPT work, that adapting theory for medical education use is not a light undertaking, and can create additional cognitive load considerations (S5). If quality cultural competency curricula, grounded in wider theory, is required; medical school stakeholders, including national curricula coordinators, need to be prepared for the

workforce commitments and challenges of adapting cultural competency curricula (Wachtler and Troein, 2003).

Finally, considering 'local' and institutional buy-in may be important in designing specific cultural curriculum that actually meets the wants and needs of local cultures (Kamaka, 2010). This could also help in the redistribution of 'power' to address specifically the economic disadvantage (Power, 2012), by involving these groups more in the educational design of the system meant to eventually 'serve' them. Being critical about the role of power dynamics in WP work is essential, both in creating more culturally conscious curriculum, but also in thinking more broadly about systemic issues related to WP. Indeed, broader perceptions around medicine and medical education as hierarchal (Rees et al., 2007), can also be seen in WP work, and were findings in this work. For example, in Chapter 7, facilitators in part saw the role of WP anatomy outreach as 'breaking down barriers' and challenging perceptions of higher education as an unapproachable 'ivory tower.' The work presented in this thesis provides more evidence to the issues with power dynamics in the field, largely between WP-background students and their perceptions on the system of medical education (Chapter 9), but also in WP-supporting faculty and staff who grapple with the power imbalances around WP work itself and medical education systems (Chapters 7 and 8). Reflecting on such power imbalances shifts the onus of WP deficits from individuals to students; the challenges in progression and positive change for WP are not necessarily to do with the lack of a student's efforts, but individuals may be trying in a system that is not designed to support them.

Challenging curriculum and power cultures, again, requires significant commitment not just broadly from national and international networks, but from medical schools at a much more individualised level (Chun, 2010). Schools need to engage deeply in work, seriously reflecting on questions such as: where might bias exist in educational structures? What groups are not represented or included in curricular discussions around culturally competent care? What are the most prevalent displays of power struggles in everyday practice? Only by seriously engaging in these challenging conversations might schools move the needle of their culture to truly foster more

belonging, and also support WP. Still, commitment to this branch of educational enrichment could really help in breaking down medical school elitism, for WP-background individuals and beyond (Crosson et al., 2004).

10.3.5 How Diversity Discourses Serve (or Do not Serve) Widening Participation

Lastly, findings from this doctoral work provide an alternative perspective on the importance of WP-related discourses for the field of medical education. Primarily discussed in Chapter 3 (3.3), WP-related discourses present various arguments for supporting WP: as educational enrichment, to support utilitarian healthcare needs, or as a means of social justice. These discourses are fairly well defined in WP literature (Jones and Thomas, 2005; Dueñas et al., 2021), and are posited to be important in understanding motivation for medical education WP. However, findings from the studies in this doctoral work make the argument that while these discourses might exist in the field, they are not necessarily so distinct, nor key in driving WP facilitation.

In the anatomy outreach work, there was no singular or shared motivator for facilitators to contribute to WP in this capacity (O4); individuals tended to have highly personal or professional drivers. For some, this was about providing educational enrichment via unique anatomy experiences, like viewing cadavers or doing animal organ dissections. For others, they believed that outreach might 'downstream' contribute to diversification of the profession, or support general health and anatomical literacy for the public. And many cited personal reasons, such as being from a participant-described 'working class' background, valuing service via religious upbringing, or seeing outreach as aligned with political ideology. However, all of these elements were more about individual beliefs, rather than some broader shared discourse. These findings also demonstrated how for many participants, motivators could be mapped to various discourses. For example, a participant citing supporting outreach for underserved groups as a means to: provide access to unique education to the students, support immigrant communities in access to health literacy, and encourage a student to pursue healthcare education, ascribes to all the aforementioned WP discourses, without citing any as a stronger influence to the others.

From the Gateway year selection work, participants generally shared comprehension that the purpose of the Gateway year was to support WP (S2a). There were subtle differences in what WP meant, for example to promote 'train local, work local mentalities' (aligning more with utilitarian healthcare thoughts) or as the 'right' thing to do (aligning more with social justice considerations). But regardless of these subtle differences, WP was supported, and viewed to be a common goal for the group working to implement the year. However, what did differ was the consideration for support outside of this 'ingroup'; participants questioned awareness, and general commitment to this means of WP in the medical school as a whole (S2c). While specific reasons for these 'ingroup-outgroup' differences were not included by participants, this finding raises questions about whether all individuals in the medical school strongly ascribe to *any* WP discourses. Or, if individuals do, it perhaps is not a high educational priority. This is particularly concerning in considering the study setting; this work was conducted at one of the new generation medical schools, that is believed to have stronger links to supporting WP (Howe et al., 2004). If this experienced disconnect can happen in a university with 'clear' WP mission, this suggests that there could be wider disconnect in schools with less of an apparent WP mission, or that perhaps institutional culture matters less in promoting WP than previously suggested by some in the field (Alexander et al., 2017; Cleland et al., 2015). The present work counters that it is individual mission alignment that is the stronger driver for supporting WP, not institutional mission. If institutional culture supports this, then support and facilitation may be met with more ease or less friction. But it is individuals, not institutions, that currently hold the real drive to continue to promote WP. As such, individuals might find it beneficial to become more familiar with the variety of diversity discourses, to have arguments for requiring more institutional commitment and support for WP and WA. While they need not ascribe to all such discourses, or may ascribe to them all, these might be useful for having a variety of evidence in recruiting less WP-committed others.

10.4 Key Implications and Recommendations for Practice & Policy

The above interpretations allude to some of the implications from this doctoral work, and how these might inform policy and practice. This section clearly identifies

three of the major implications, drawn from all interpretations, and how these link to practice and policy.

10.4.1 Moving Beyond Discourses to Tackle the Pseudo-Meritocracy of Medical Education

The findings here suggest WP discourses may matter to some extent in medical education, but it may not be as important as previous works suggests. Perhaps, the more important distinction is between those who 'do' and 'do not', not in the reasons *why* those who 'do' do. As such, future practices and policy should consider how to promote current WP mechanisms, but while involving a wider range of individuals, particularly those who may be less naturally inclined to support such initiatives without clear institutional and professional mandates. Along these lines, specifically addressing the discourse of 'meritocracy' in medicine may be key, as described in Chapter 3 (3.3.1). Medical education promotes a myth of meritocracy (Razack et al., 2020), or pseudo-meritocracy, as described here. This notion posits that while in an ideal world, medical education would be a system that admits students on their achievements and potential to be a great doctor; in reality, this system of meritocratic judgements for admission and progression do not consider baseline privileges of some students. As such, the system needs to be straightforward in critically examining achievement, and understanding how and where achievement may actually be a proxy for privilege, such as wealth. Being critical of the pseudo-meritocracy may also reveal ideological differences in medical schools, distinguishing between those who commit to various levels of widening participation.

While this might result in difficult conversations and policy actions, tackling the differences between those who do not believe in WP and those who do, for whatever reason, might be key in strengthening WP mechanisms. This might also provide a means to discussing more 'radical' forms of WP, such as contextual admissions (Fielding et al., 2018; Powis et al., 2007). If more individuals and institutions can get behind this form of WP, this also might help relieve some of the resourcing and stigmatising concerns raised by programmes like Gateway years, as

identified in this doctoral work. This point will be revisited below, in a section specifically focussing on recommendations for Gateway years (10.4.4).

10.4.2 Call for Critical Creativity in WP Mechanisms

Another key implication from this work, more focussed than the broader needs for WP, is a more critical examination of existing programmes. This implication is particularly important considering the current educational climate; while the COVID-19 pandemic has presented immense challenges, disruption, and hardship (Bowleg, 2020; McManus et al., 2020; Smith and Cleland, 2020), it also perhaps presents opportunity. As noted in the outreach work, a lot of WP work has been disrupted in the past year (O5). This disruption has also been demonstrated elsewhere, even with some programmes pivoting to virtual outreach offerings (Bligh et al., 2021). Still, as things start to shift towards the 'new normal', there may be new opportunity to critically think about education (Efuribe et al., 2020; Burgess and Sievertsen, 2020), including WP. In particular, reframing WP mechanisms not just as what WP-background individuals want or 'need' from the perspective of medical school faculty and staff, but perhaps the unique characteristics these student groups 'offer'. This might happen via reframing outreach in particular to more of the ideals presented in the anatomy outreach work of this thesis, as aligned with moving away from deficit models of WP (Alexander et al., 2019). This practice may be challenging, given likely deficit discourses about academic disruptions also resulting from COVID-19 (McManus et al., 2020; Woolf et al., 2021). Still, having conversations about re-thinking WP should be prioritised in medical school working groups, and national governing bodies. Additionally, as noted above, strengthening cultural competency curriculum to empower more students, is another key avenue to explore. Rethinking WP with critical creativity, is required. Recently, there has been the suggestion that the use of an apprenticeship model for WP-background individuals to achieve medical qualifications (Rimmer, 2021), without the competitive and elite system of medical school application. This is an interesting, and radical proposal, that could address some of the WP issues identified in this work. This model could also provide apprenticeships in specifically underserved areas and specialities, addressing the healthcare utilitarian argument for WP.

10.4.3 Scratching the Surface of Understanding WP

This doctoral work demonstrates that more depth in research is required. This thesis just scratches the surface of ways in which WP mechanisms can be more critically examined. It demonstrates that these issues really matter, not just in broad strokes of practice, but to the people at the heart of WP: the students trying to navigate the system, and the staff trying to support them. There is work to suggest that WP is a 'wicked problem', or a complex and ever-changing problem, with no rational or clear solution (Cleland et al., 2018). Wicked problems are described as problems that are often epiphenomena of other social problems, just as WP focus and issues are described in Chapter 3 (3.2) as related to broader issues around income and class in the UK. This doctoral work agrees with this consideration, but concludes that wicked or not, it is an important problem that warrants much more research in the field. Although there may be no simple solutions, WP still deserves the research attention that any other 'sub-field' of medical education receives. There needs to be more rigorous, evidence-base understanding for how WP practices function, to hopefully improve their function (Nicholson and Cleland, 2015). National support and policy could support this; specific funding for investigating WP programmes, just as there has been more nationalised support for enactment of broader programmes, should be considered. Without sufficient research funding for this sub-field, investment in programmes may not succeed in realising their full potential.

Such support should also fund more in-depth research that includes patient populations. This element is notably missing in the field, and in this doctoral work. While students in the retention study noted that they perceived elements of their clinical practice to be better due to their WP-background, understanding if patients potentially share these views may be key in arguing for the expansion of WP mechanisms as achieving the goal of better-quality healthcare.

10.4.4 Specific Recommendations for Gateway Years

Finally, a large proportion of this work specifically examined Gateway Years, the reasons for this detailed in Chapter 6 (6.2.1.1). As such, these studies provide critical reflections and recommendations about these programmes, building on what has been a fairly small body of literature (Curtis et al., 2014a; Curtis et al., 2014b; Curtis

and Smith, 2020; Brown and Garlick, 2007; Garlick and Brown, 2008). This work demonstrated many aspects of Gateway years that are very positive: being a 'safety net' of opportunity, resulting in true widening access and participation, providing an elongated transition period to ease students into university life, and supporting bonding social capital for similar background peers to connect with each other, and supportive faculty and staff. However, this section will focus on dissecting the shortcomings identified a bit more, to generate recommendations for the future of these programmes. Notably, the perpetuation of these years in terms of negative economic and social capital will be detailed, then consideration for Gateway years versus other viable WP/WA options will be made.

10.4.4.1 Improving on 'Costs' of Gateway Years

To the first point of economic capital, the findings of this thesis suggest that Gateway years are not a cost-effective means of WA and WP, from both the perspective of the university and students. These years require a large influx of resourcing, particularly in considering in their unique curricular design, as evidenced by the NPT work. And for students, taking on an additional year of study can be a big financial ask. These considerations link to points noted above (10.3.3) – who benefits from WP, and who pays for it? Present findings suggest that Gateway faculty, staff, and students are the ones 'paying for it' currently. Medical schools enacting Gateway years need to be conscious of this when they opt to create these pathways; with the number of operational Gateway years now at 17 medical schools, from the seven or so that existed only five years ago, the number of individuals who may be negatively affected by the costs of Gateways is expected to increase (Medical Schools Council, 2020a; Medical Schools Council, 2017a). So, what can be done to mitigate the negative economic effects? This work makes two key recommendations for medical schools and governing bodies to consider: resourcing for national Gateway year curriculum and coordinating paid Gateway student work experience.

Review of all Gateway years via this research demonstrated huge heterogeneity in curricular set-up (Dueñas et al., 2021). To an extent this is understandable, as schools should aim to align their Gateway years so they set students up for success upon entering Year 1; for example, it might be unwise for a medical school to have

laboratory skills for their Gateway students, if their medical degree programme has no expectations for laboratory- or bench-science research. However, construction of some sort of national Gateway curriculum could present a good starting place for schools wishing to develop, or earlier on in development of, a Gateway year. This could help avoid schools with huge resourcing costs, that might be associated with 're-inventing the wheel', so to speak; more efforts should be made to share resources, and draw on expertise from successful Gateway years. If there were more formalised or accessible materials, such as syllabi, teaching activities, assessment materials, etc., available through the Medical Schools Council, this could hopefully help alleviate costs and onus placed on Gateway year coordinators. If the MSC states WP as a national priority (Medical Schools Council, 2018e), creating nationally available materials to support this could help move this notion from ideal to action. However, its worth considering that there may disadvantages to this approach. First, determining who is best positioned and responsible for creating this repository may present challenges, and create more WP taxes for academics and staff, if creating materials is not managed equitably. Second, the actual content would need to be carefully considered. The challenge with any sort of nationalised Gateway curricula would need to be adaptability. As noted above, Gateway years need to have curricula that aligns to their associated medical school. National curricula that are not adaptable may do more harm than good; particularly for students, who may learn or focus on Gateway year content that ends up not being particularly helpful in subsequent years of medical education. However, based on some of the findings in Chapter 9, this appears to already be the case for some programmes. For example, anatomy content, which proved very helpful for students for Year 1 of medical school, was not always a feature of Gateway years. If the MSC had guidelines, teaching activities, or suggested curriculum for anatomy content, following with this example, this might prove very helpful to faculty and staff creating Gateway year curriculum, or looking to improve theirs. It would not be required that schools utilise these curriculum resources, but a repository of nationalised curricula could certainly help improve labour costs associated with starting Gateway years.

The other recommendation deals with supporting students' financial burdens. Students on Gateway years in the present work noted how part-time work was a common facet of their Gateway and medical school experiences. This is not uncommon for WP-background individuals, who often have looming economic concerns that medical school peers from 'elite' backgrounds may not face (Brosnan et al., 2016; Bassett et al., 2019). However, medical schools who admit these students can, and perhaps should, do more to support economic capital gains; this could also be done in conjunction with providing clinical capital that WP-background students might not have. Work experience prior to medical school is often challenging for WP-background students to obtain (Nicholls et al., 2017), due to lack of time or social connections, which has led to many schools phasing out any formal or clinical work experience selection requirements. Still, many Gateway years include clinical work experience curriculum, presumedly to provide students with these opportunities before Year 1, thus 'levelling the playing field.' But, in review of all Gateway years as noted in Appendix A, one school goes a step further; University of Aberdeen coordinates *paid* work experience in the NHS for its Gateway year students. Given the economic burden Gateway students face, its recommended that more medical schools adopt such a system. While there might be challenges associated with this, it warrants critical examination, as this is two birds, one stone, model – facilitating gain in medical school capital (via clinical experiences), while lessening economic burden for WP-background students.

10.4.4.2 Addressing the 'Otherness' of Gateway Years

This work highlight how 'other' Gateway students can feel, whether it be linked to the names and language associated with Gateway years (Year '0', not part of the medical student cohort), or to the microaggressions associated with classism. While these findings are concerning, these likely reflect the continued elitist attitudes that are pervasive in medicine, as similar experiences around "everyday classism" have been noted in WP-background populations who did not participate in a Gateway year (Beagan, 2005; Conway-Hicks and de Groot, 2019). So, what could be done to address this, both for Gateway matriculants, but all students?

'Otherness' is a complex social concept, and pervasive not just in actions but the language that individuals use to describe certain minoritised groups (Cleland and Palma, 2018). Cleland and Palma (2018) discuss in their work examining 'othering' with medical school deans that more responsibility for deconstructing systems of otherness needs to be placed on academic leadership. The present work agrees with this notion; a top-down approach is required to address the 'otherness' Gateway students experience. It is not enough for small, albeit supportive, groups of faculty to take responsibility for this, and may be challenging given power dynamics in medical schools. As such, again, governing bodies should play a more active role in addressing these elements. Requiring trainings and medical schools to critically examine their language and beliefs around WP and WA is warranted. The above section (10.3.4) proposes more cultural competency training for medical students; similar advances should also be made for medical school faculty and staff at all levels.

10.4.4.3 To Gateway Year or Not to Gateway Year

A participant in the work in Chapter 9, reflecting on stigma, economic costs, and minimal clear academic benefit, posed the question – do Gateway years need to be a year? Is there a way to synthesise the benefits, while minimising the negatives? Indeed, these are important questions. This work considers two theoretical alternatives to Gateway years that should be considered, based on present findings: 1) increased contextual admissions for standard entry with WP-oriented support for year 1, and 2) a short-term, intensive or pre-matriculation Gateway programme, lasting not a full year but weeks or month.

To the first point, contextual admissions already exist in medical education, as explored in Chapter 4 (4.4.4), and Gateway years entire selection process is based on contextual admissions (4.5.1.2). Admitting Gateway students to standard entry, and supporting them with a yearlong enrichment programme could address the otherness and stigma experienced by these students. It would also decrease the economic costs of doing an additional year of medical education. This type of programme would retain bonding social capital, by providing a space for WP-background students to gather, and staff could still be involved. Integrated revisions

and tutorials, covering key topics, so as not to lose the appreciated academic elements of a Gateway year would be key. Alternatively, a short-course or 'boot camp' prior to matriculation could be used. This would condense the Gateway year content into a short course, to introduce students to each other and medical school staff, just prior to starting year 1, retaining positive 'ease-in' elements of a Gateway year. Key revision topics could be covered, again accounting for academic elements that are identified as possibly most useful for students admitted on the discounted grades for Gateway years. This alternative notion of short-term, intensive, pre-matriculation programmes was introduced in Chapter 9 (9.6.4). Both of these types of programmes may not just support students, but lessen staff burdens associated with facilitating a Gateway year, or at least shorten the time commitment during the academic year. They also present the opportunity to allow for larger cohorts, given they are shorter and likely less resource-intensive; this could ultimately allow for greater representative cohort diversity in standard entry years.

However, both of these alternatives are not guaranteed to be successful alternatives. First, given the level of elitism and everyday classism that exists in medical education (Beagan, 2005), even without a Gateway, there is no ensuring that swapping a year for a supplemental or short course would help lessen the stigma noted in progression of students. This may be linked to their WP-background, or take new form with different programmes. Second, given the continued standard and reliance on grades for medical school selection (McManus et al., 2013c), it may be challenging to get enough stakeholder support to lower contextual admissions for standard entry to the level many Gateway years are at, or even slightly below, for competitive programmes. Both of these concerns reflect much larger systemic issues in medical education and selection, but would potentially diminish the success of alternatives.

Furthermore, while this thesis provides evidence that Gateway years might not be the best means to WP and WA to medical education, it does not completely discount them. There were positives associated with these years, such as easing students in and fostering confidence in diverse perspectives. And the majority of staff were determined to continue to commit to the Gateway year, even if hoping for more

resourcing and training. Gateway years successfully widen participation and access for socioeconomically disadvantaged students (Curtis and Smith, 2020). And, as this work found, they may be a true safety net of opportunity for these students.

So, to Gateway year or not to Gateway year? The position of this doctoral work is in favour of Gateway years – for now. Ultimately, there needs to be much more research on the function of these programmes, including cost-benefits analysis against potential alternatives, like those suggested here. Additionally, medical education, as a whole, needs to make strides to be more inclusive and supportive of all WP mechanisms and diverse individuals. Until both of these happen, and provide evidence on whether Gateway years are truly fit for purpose, they should continue to be maintained and supported as an important medical education "lifeline" for many students.

10.5 Limitations & Future Directions

While the previous section demonstrates the implications from this doctoral work, it is not without limitations. Each results chapter made note of limitations and future directions for individual studies; here, the limitations of the thesis as a whole are addressed. However, these are also framed by subsequent future directions to help address these limitations moving forward.

10.5.1 Qualitative versus Quantitative Inquiry

Referring back to the overarching methodological chapter (Chapter 6), it is worth revisiting how this doctoral work evolved from what was originally planned. Real world constrictions and a pragmatic approach resulted in this doctoral work being a predominately qualitative examination of widening participation. This in itself is not a limitation; qualitative research can be key in providing depth and context to fields of research, particularly when performed rigorously (Varpio et al., 2017). However, more quantitative research in this field is also warranted, and this doctoral work is limited in this contribution to the field. Particularly for Gateway years, with the expansion in the number of these programmes in recent years, it is paramount to understand the quantitative function of these year, and to link such findings to qualitative work, like presented here. Curtis and Smith (2020) present an excellent

initial quantitative examination of Gateway years, but this study only draws data from three institutions. While this doctoral work considered broader quantitative investigation, the current state of national data made this impossible at this stage; although, this 'finding' was reported back to the UKMED working group (Appendix B), and thus will have impact on future WP-related work in the field.

Future directions in quantitative inquiry, however, can be informed by the qualitative findings from this thesis. For example, understanding attrition rates better, particularly if the reasons for attrition are linked to academic performance measures, or other causes, may be key. This might help in demonstrating the progression impact of stigma and classism, or the challenges that WP-background students face, such as financial hardship. Additionally, comparing the academic journey and performance of students on Gateway years to standard entry peers of WP-background within the same institutions, may be another area to pursue. In the present work, Gateway students perceived anatomical and clinical opportunities in their Gateway year to be academically advantageous. However, understanding if this is reflected in performance, particularly compared to peers of similar background, thus 'controlling' for the Gateway year as an intervention, requires quantitative examination.

Additionally, more critical examination using a system like UKMED could be particularly useful in understanding if WP initiatives are meeting 'downstream' goals, particularly as they relate to healthcare utilitarian perspectives. Are students recruited from underserved areas more likely to return to practice there? Are students from WP-backgrounds more likely to choose careers in underserved specialities? And if the data indicates the answer to either of these questions is 'yes,' then the question should follow – is this an equitable system, or are WP programmes widening participation, but still limiting social mobility? Returning to qualitative inquiry could help to explore this concern. For example, recruiting schemes that offer funding to work in deprived regions (O'Dowd, 2016) may attract more individuals from WP-backgrounds, due to their continued financial needs, and possible loans from undergraduate education. But, these methods do not address the wider issues with these underserved professions and areas, such as intense

workload or potential lower job satisfaction (Barber et al., 2018), that ultimately can result in burnout and retention issues (Oxtoby, 2021). It may be the case that addressing WP in medical school ends up creating a two-tier system of practice, where those from elite backgrounds feel they have more options, and those from WP-backgrounds are 'forced' into specific routes. Unless the entire system of medical education, including postgraduate paths, are also critically examining, it may be that current mechanisms are only moving the goalpost for WP-associated issues.

10.5.2 Limitations of Multi-Methods

This doctoral work, as a whole, investigates three different aspects of WP, but also utilises different methods in each of these examinations. As such, its limited in its ability to directly compare the means of WP (outreach, selection, retention) to determine which of these elements should be the focus of primary 'investment' for the future of WP policy and practice. However, regardless of methods, any comparison of these broad mechanisms may be like comparing apples to oranges, or perhaps oranges to grapefruit to satsuma; while outreach, selection, and retention all fall under the scope of WP, they all serve different purposes, as described in Chapter 4.

Still, future work could apply some of the methods used in this thesis to other WP elements, to test the utility of these in furthering understanding across the board. For example, the use of Bourdieusian analysis in the student experiences work (Chapter 9) proved insightful in understanding capital and habitus in more detail. A similar analysis framework could be applied to outreach work, to understand pre-medical students understanding of capital and habitus, for comparison. This is just one example of the ways the methodological contributions of this doctoral work (detailed in the next chapter, 11.2.1) could be used to further future work, benefiting from the multi-methods approach this thesis used.

10.5.3 An 'In-Group' Examination of WP

Finally, this doctoral work might be considered very much an 'in-group' examination of WP. The primary researcher and all members of the research team believe in WP, thus aligning with the work from a axiological standpoint (Biedenbach and

Jacobsson, 2016), as described in Chapter 6 (6.2). However, this sense of shared ideology means this work was conducted through a particular lens. While critical of WP *function*, this work was not designed to be critical of its *existence*. As such, it is possible there were many means of investigation overlooked. However, it is hope that by being clear in reflexive elements throughout, this 'bias', or perspective, is sufficiently acknowledged (Dowling, 2006).

This 'in-group' limitation also applies beyond the research team to the study populations of all the included studies. For the anatomy outreach work (Chapter 7), facilitators were interviewed; anatomists who opt not to assist in outreach were not included. For the NPT work (Chapter 8), there was self-selection for participation, resulting in almost all participants from the initial work having some direct involvement with the Gateway year; there was limited perspectives from medical school staff outside of immediate circles. And finally, all students surveyed and interviewed in the work from Chapter 9, were part of the medical education system. As such, the Gateway year and any subsequent educational experiences, had resulted in successful progression and retention to the point of study; the work did not include any individuals who may have left university during or after their Gateway year. In the entirety of this work, study populations focused on those supporting and benefitting from WP. But, in considering the wider field, there are a range of views that could be equally informative.

As such, future work should make efforts to not just focus on the system of WP in medical education, but beyond it, particularly to those the system might have 'failed'. For example, repeating the work in Chapter 9, but instead with students who left medical education after their Gateway year could be key in understanding significant barriers to retention. It is worth noting, however, this type of 'out-group' work may present unique challenges around study recruitment. With the aforementioned example, or any reiteration of this doctoral work with members outside of the WP sub-field, identification of potential participants may prove very challenging. Students leaving medical education may not be keen to participate in research as to why, and serious ethical considerations for the potential stress and psychological implications of this work would need to be considered. That is not to

say that this work is not important and worth the challenges, but it calls for creativity, and perhaps a more group-oriented approach to research, involving a wider range of individuals on research teams. For example, involving student support officers, or similar, in WP research may be an avenue to explore. These individuals may be better suited to engage in recruitment and data collection, than an untrained medical education researcher, particularly for students at the point of leaving medical education. A more collaborative and broad approach to future research is worth considering.

10.6 Chapter Summary

This chapter presented an overarching discussion of this doctoral work, including synthesis of all findings to make combined interpretations from this work. Key implications and recommendations for the field were made, followed by recognition of some shared limitations and suggestions for future directions. The next, and final, chapter of the thesis concludes with final remarks and summarising the original contributions of this doctoral work to the field.

Chapter 11: Thesis Conclusion

11.1 Chapter Introduction

This final 'chapter' concludes the work by noting the original contributions from this thesis, and ending with concluding personal remarks. Original contributions that have been published or disseminated via conference proceedings are also detailed, and briefly described, in my List of Contributions section, at the start of this work.

11.2 Original Contributions…

11.2.1 To Theory, Knowledge, and Methodology

The various elements of this doctoral work make original contributions to the field in terms of theory (Dueñas et al., 2021), knowledge (Dueñas et al., 2021), and methodology (Laughey et al., 2021a).

The model constructed to conceptualise anatomy outreach, via grounded theory, is a novel and theoretical contribution to the field. This theoretical model can now be utilized, tested, and re-imagined for similar forms of outreach, to contribute to sound understanding of how outreach in the field exists and functions. It is currently in the process of being disseminated, via conference proceedings, as well as influencing practice. During the course of my doctoral studies, I have undertaken a committee position with the American Association for Anatomy's Diversity, Equity, and Inclusion committee; via this role I am able to directly use my research findings to improve the theory behind our approaches to anatomy outreach.

The findings from Gateway students in this work is a unique knowledge contribution to the field. While aspects of the lived experience of these students can be compared to those of similar background, the study population and theoretical framework used in Chapter 9 have never been applied together in the field. As such, knowledge of these student experiences in this capacity represent an original contribution to knowledge, that has also been shared via conference proceedings (Dueñas et al., 2020a).

Methodologically, this doctoral work has made a number of contributions. First, adapting NPT in a medical education setting to understand programme implementation has never been done before. This work, and the findings presented

in Chapter 8 (particularly section 8.7.3, and reiterated with finding S5 of Chapter 10, 10.3.1), contribute to the understanding of methodological (and theoretical) borrowing. Drawing on systems widely used in the allied field of healthcare and sociology can aide in methodological rigour in medical education. Second, some unique methods were employed in this doctoral work. Notably, in the student experiences work (Chapter 9), the initial survey utilised love and breakup letter methodology, as a unique and novel means of surveying students on 'user' experiences, in medical education. This method has methodological promise in the field, and a paper describing this and other work I have contributed to during my doctoral training has been published (Laughey et al., 2021a; Laughey et al., 2021b), including insights from using this methodology in this doctoral work.

It is also worth noting here the contributions I have made to the field, by way of my doctoral *training*, in addition to the work that directly related to this thesis. While undergoing my training, I wrote a monograph piece with a cohort member, detailing the importance of paradigms for this field, and presenting them simply for novice researchers (Brown and Dueñas, 2019). This was detailed in Chapter 6 (6.1) of this work, as well. I have also pursued additional research, aligning more so with the field of anatomy, including: an examination on the role of humour in anatomy labs (Dueñas et al., 2020b), continuing contributions to my Master's work in embryology education (Plunkett et al., 2019), and an exploration of the ways art-based approaches can be utilised in anatomical education (Dueñas and Finn, 2020). And through this all, I have improved on my international networking, particularly using social medical platforms to disseminate and discuss pedagogical approaches in the fields of medical and anatomy education (Finn et al., 2020).

11.2.2 To Practice & Policy

This doctoral work also contributes to practice and policy in the field of WP in medical education. The report generated from the consideration of quantitative inquiry, while not sufficient to formally be included in this thesis, was provided to the working group for the UKMED. In this way, it might allow for re-consideration of policy on data collection and categorisation of what programmes constitute a Gateway year in the system's data organisation. As noted earlier (Chapter 6, section

6.5), this report is accessible via the UKMED website and is included in the appendices (Appendix B: UKMED Report). Aspects of this work have also been used to inform practice, particularly within the Hull York Medical School; for example, dissemination and follow-up from the NPT work has been used to synthesise recommendations for future practice to improve the function of the Gateway year. Via various presentations of this doctoral work (detailed in the Contributions section) it is also hopeful that this work has informed broader practice in the field of WP, both nationally and internationally (Dueñas et al., 2020a; Dueñas et al., 2021).

'Hope' is a word used here to describe these contributions, and elsewhere in this thesis, as it is my belief that perhaps the true impact of our actions, or in this case research, can perhaps never be fully appreciated or noted. I *hope* that with every 'administrative' meeting I attend and speak at, with every email about my research I answer, and every opportunity I get to work and teach alongside WP-background students, that I am positively informing practice in this field. Much of this work will never be reflected in publications or formal presentations, but I ascribe to the power of this 'on-the-ground' work to try and inform real action when it comes to promoting good practice and policy that can help further the cause of WP.

11.3 Concluding Personal Remarks

This doctoral work, like any other, has been a challenging personal and professional journey, unexpectedly disrupted in many ways by a global pandemic. And yet, there is a huge amount of privilege in being able to conduct research in this field of widening participation, during this time. I have been in many ways awestruck by the determination and resilience of so many of my study participants, in all parts. In their drive to try and 'better' a flawed system, in any way they can.

But through this work, those flaws in the system feel even more relevant, and stand out as major concerns. As I examine my findings and recommendations, I am left considering – what do we do next? There are so many potential avenues of future exploration in medical education WP, and so much more work to do. And for all the 'good intentions' of actors within the system, it is easy to also get discouraged by these many avenues, considering the unintended consequences of WP, and the

concerns about commitment to this sub-field, outside of dedicated individuals. I also genuinely wonder about downstream effects of actions, if the healthcare system that medical schools funnel into is prepared for greater diversity of graduates. If these doctors will be able to actually improve patient outcomes, given the number of structural barriers that they and their patients can face. I think it can be easy to feel pessimistic, or like the winds of change are not moving at an urgent enough pace. And, drawing on my reflexive considerations, I find my 'educator first' mentality to exacerbate this. There are faces, and personalities, and stories associated with WP-background individuals, in my mind. It has been a privilege to teach Gateway year students the past couple of years, and work with diverse and underrepresented groups before that. But I am left wondering if the system, or myself, is doing enough to do right by these individuals? And some of the bleaker findings of my research, particularly around otherness experienced by students, echo this.

However, to counteract my worry and frustration, I like to remember a quote from the late John Lewis, American politician and civil rights activist, "If you see something that is not right, not fair, not just, you have a moral obligation to do something about it." While it does not feel like nearly enough, I hope, in even some small way, that this doctoral work is me, 'doing something about it' when it comes to promoting a more diverse, equitable, and inclusive system of medical education, and healthcare. And if the positive aspects of this thesis have demonstrated anything, it is that there are a lot of people also trying to do something about it, despite the systemic and structural challenges abating us. It is my deepest hope, that as we all continue to do research in this field, creating a stronger evidence-based for best WP practice, that the numbers of individuals and groups taking action will continue to mobilise, and eventually justice will be at the forefront of medical education. There is a lot of promise in WP, for the hopes of better medical education system and a better world, and I hope in continued work like this thesis, we can come to see that promise realised. I hope that in my career 'lifetime', I am able to help promote and witness a discourse change around WP- and diversity-oriented work, away from notions of deficit models and discourses of a 'deserving poor' that have beat the 'odds' to a

story that celebrates the needed contribution of these individuals to education, and healthcare practice.

To conclude, reflecting on the findings and process of this doctoral work, I have five key take-aways. I hope (there is that word again), to be able to help facilitate all these messages in my own practice, and encourage all those in medical education, not just in the sub-field of widening participation, to promote these as well:

- Support a paradigm shift in the field, to make outreach about connections and altruism, not deficits and metrics
- Expand on stakeholder investment in widening participation, to alleviate the WP-tax
- Invest in more cultural competency curricula and training in UK medical education, including socioeconomic factors
- Use diversity discourses and evidence to convince WP reluctant individuals to support WP and WA
- Improve Gateway years with national curricula guidelines, paid clinical experiences, and national training, while investigating cost-benefits of potential better alternatives

With these recommendations, and by critically examining the current state of outreach, selection, and retention in widening participation in medical education, this doctoral work contributes to a step in the right direction for this field of work.

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Appendix A: MSC-Identified Gateway Years

This table compares all current Gateway to Medicine years in the UK, including: location, name, academic entry requirements, WP entry requirements, and curriculum details. Information was derived from the MSC website, and individual school webpages.

Medical School	Name of Gateway Year	Academic Requirements for Entry			WP Requirements for Entry (Including non-exhaustive examples of criteria accepted)								Gateway Year Curriculum Details (Sample modules/courses)		
		Letter Grades Required (*compared to standard entry grades*)	Grade Details or Specifications	Admissions Test	Number of WP Criteria Required	WP Pathway/Programme Participant	First Generation in Higher Education	Postcode Related (low income neighborhood, rural, local, etc.)	Recipient of funds such as UCAT bursary, award, free school meals	Carer or care leaver	School Related (state funded school, school with low participation)		Science Subjects	Clinical Subjects	Other Subjects
University of Aberdeen	Gateway2Medicine	AABB (*AAAAB*)	Scottish Highers, must include 2 sciences	UCAT (before or after course)	3/9	X	X	X	X	X			Cell biology, biochemistry, human body structure & function,	Paid work experience in NHS	Science presentation skills, Introduction to Health Services
University of Bristol	Gateway to Medicine	BBC (*AAA*)	A Levels, B in either Biology or Chemistry	UCAT	1/2					X	X		Basic anatomy, physiology, biochemistry, chemistry	Clinical work experience	Math & statistics, professionalism
University of Bradford [a]	Foundation in Clinical Sciences/Medicine	CC (-)	A levels	N/A	2/10		X	X	X	X			Chemistry, Biology	-	Laboratory & Study Skills, Health & Society, Personal & Professional Development
University of Dundee	Gateway to Medicine	BBC (*AAA*) Or	A Levels, in Chemistry and other science	UCAT	Unspec.								Numeracy, chemistry, & physics; science electives (cell	-	Science & society; skills electives

University	Programme	Grades	Qualification	Test	Ratio							Content 1	Content 2	Content 3
		ABBB (*AAAAB*)	Scottish Highers, in Chemistry and other science									biology, genetics)		
Edge Hill University	Foundation Year for Medicine	BBB (*ABB*)	A levels, must include Biology & Chemistry	UCAT	3/10 (** are required)		X	X**		X	X**	Biomedical sciences, anatomy & physiology	Clinical perspectives, clinical communications, work placements	Personal & professional development, health systems
University of East Anglia (Norwich)	Medicine with a Gateway Year	BBB or ABC (*AAA*) Or CCC (*BBB*)	A levels Scottish Highers	UCAT	1-2/7	X		X	X	X	X	Introductory biology, additional biology	Introduction to clinical medicine	Psychosocial health, healthcare issues
University of Glasgow	Glasgow Access Programme (GAP)	AABB (*AAAAA / AAAABB*)	Scottish Highers	N/A	1/3	X		X		X		Biology & Science Fundamentals	Clinical communication & professionalism	Fundamental skills
Hull York Medical School	Medicine with a Gateway Year	BBC (*AAA*)	A levels, B in Biology & Chemistry	UCAT	2/3 (** alone suffices)		X	X	X	X**		Human Biology	Clinical Skills	Health & Society, Professionalism & Ethics, Academic Scholarship
King's College London	Extended Medical Degree Programme (EMDP)	ABB (*A*AA*)	A levels, including A in either Biology or Chemistry and B in other	UCAT	1 (O – may also be considered)	O		O		O	X	Foundations of Medical Science, Physiology & Anatomy, Genetics	Values Based Clinical Practice	Academic writing, science communication
Lancaster University	Medicine with a Gateway Year	ABB (*AAA*)	A levels, must include Biology & Chemistry	BMAT	2/8		X	X	X	X	X	Unspec.	Unspec.	Unspec.

University	Programme	Offer	A level requirements	Test	Ratio							Modules		Modules
University of Leeds	Gateway Year to Medicine	BBC (*AAA*)	A levels, including Chemistry or Biology with B; Physics or Maths if no Chemistry	BMAT	2/6		X	X	X	X	X	Foundational Life Science	-	Lifelong Learning, Health & Illness, Professional Practice
University of Leicester	Medicine with a Foundation Year	BBB (*AAA*)	A levels, including Chemistry or Biology and one other science	UCAT	2-3/9 (**is required, O – must meet combination of 2)	O	O	O	O	X	X**	Foundations of Biological Sciences, Introduction to Medical Sciences	-	Exploring Psychology
Lincoln Medical School (Nottingham Lincoln Pathway)	Medicine with a Foundation Year	BBC (*AAA*)	A levels, must include Biology & Chemistry	UCAT	1-2/4 (** alone suffices; O - required)	X		X		X**	O	Genetics, Cells & Tissues, Body Structure, Biochemistry, Microbiology, Molecular Biology	-	Professional & Communication Skills
University of Liverpool [b]	Foundation to Health & Veterinary Studies Year 0	-	-	-	-	-	-	-	-	-	-	-	-	-
University of Nottingham	Medicine with a Foundation Year	BBB (*AAA*)	A levels, Bs in Chemistry & Biology	UCAT	2/5 (O -Must meet one of these)	X		X		O	O	Genetics, Cells & Tissues, Body Structure, Biochemistry, Microbiology, Molecular Biology	-	Professional & Communication Skills
Plymouth University	Medicine with a Foundation Year	BBB (*A*AA – AAB*)	A levels, must include Biology	UCAT	4/7			X	X	X	X	Molecules to Cells, Introduction to Human Physiology, Active Life Sciences	-	Interdisciplinary & Team Based Leaning, Hot Topics in Medicine, Learning Skills

University of Southampton	Medicine with Year 0	BBB (*AAA*)	A levels, including Biology & one other science	UCAT	3/6		X	X	X	X		Human Structure & Function	-	Professional Practice
University of St Andrews	Gateway to Medicine	BBBB (*AAAAB*)	Scottish Highers, must include Chemistry and one of Biology, Maths, Physics	UCAT	Unspec.	X		X		X	X	Biology, Introductory Inorganic & Physical Chemistry, Organic & Biological Chemistry	-	Sciences or Arts elective

[a] Bradford does not have a medical school. Students who opt for this programme can apply to matriculate onto the University of Sheffield's medical programme. The 'WP' criteria are for Sheffield, not for Bradford, and students must take the UCAT & apply via UCAS for Sheffield entry.

[b] Programme is listed as a Gateway year, but is designed for mature students and does not have same criteria as other Gateway programmes. Traditionally, Gateway programmes require applicants to be school leavers (within 2 years of leaving school), and will not accept mature or graduate-level students.

Appendix B: UKMED Report

The following is a copy of the report submitted to the UKMED working group, relating to planned quantitative examination of Gateway years. This report is also published on the UKMED website.

Report for the UKMED Research Subgroup

September 2020

UKMED P104

Title: How do students on gateway courses progress through medicine compared to standard entry peers of similar backgrounds?

Angelique N. Dueñas and Paul Tiffin

Summary

This report was created in association with UKMED P104, 'How do students on gateway courses progress though medicine compared to standard entry peers of similar backgrounds?' In the course of examination of data availability, and preparation, it was determined that there is insufficient data related to Gateway years to support the planned analysis at this point in time. However, the key issues of number of data points, as well as medical school categorisation in the UKMED, are described in detail in this report. We hope that this information proves useful in analysing and interpreting future projects, and that this important work may be completed at a future point.

Background

Students from lower socioeconomic backgrounds continue to be disproportionately represented in medicine in the United Kingdom (UK). Students who apply and matriculate into medicine still tend to be from more affluent backgrounds, with better school support. Approximately 80% of applicants to medical school come from only 20% of schools in the UK, with half of schools have no applicants at all to medicine (Garrud and Owen, 2018).

Such inequities in recent years has led to national policy directed at supporting widening participation (WP) and widening access (WA) initiatives that are designed to improve 'fair access' to higher education, including

medical education. WP can be defined as policy that encourages underrepresented individuals to pursue and apply to HE, whereas WA is better defined at focusing on ensure selection processes for HE are as equitable as possible to support the acceptance of underrepresented groups (Nicholson and Cleland, 2015). While often used interchangeably, there are subtle differences in these terms, and therefore the types of programmes that qualify as WP and/or WA. Typical examples of WP work in medicine include: outreach programmes coordinated by the Medical Schools Council, Pre-16 support programmes, Post-16 programmes, coordination of work experience in the medical field, and teacher or career advisor programmes (Garrud and Owen, 2018). In medicine, these programmes aim to support students from 'WP backgrounds,' or those who are still traditionally underrepresented, from lower socioeconomic backgrounds. WP programmes also include one larger scale type of programme; Gateway to Medicine programmes are often defined as WP initiatives (Garrud and Owen, 2018), although they are also considered a means of WA.

Gateway to Medicine have been around since the early 2000s (Garrud and Owen, 2018) (Curtis, Blundell et al., 2014a) (Garlick and Brown, 2008), and were created as a means to support the application of students from WP backgrounds, but create a specific medical entry route exclusive to these students. In this capacity, they are also WA, as they alter the selection process.

While all subtly different based on the medical school they are associated with, Gateway programmes operate in a similar manner. Only students from 'WP backgrounds' are eligible to apply; students must prove this by demonstrated a certain number of 'WP' criteria, such as being first-in-family to attend, university, living in low income postcode, attending a state-funded (public) school, receiving a bursary for the medical school admissions exam (UCAT, formerly UKCAT), or being part of a WP 'Pathways' programme. These examples are non-exhaustive, and the number or type of criteria a student must meet depends on the medical school they are applying to. If a student can prove that they meet these WP criteria, they are eligible to apply for the Gateway to Medicine route of entry. These entry routes accept lower, non-competitive academic criteria (primarily A levels grades, but also UCAT scores); many Gateway programmes will even 'cap' their grades accepted, so that if a student earns competitive grades, they are no longer eligible for the Gateway programme, and must apply to SE medicine.

If successful in their application, students will matriculate onto their Gateway Year of their medical degree. Some schools refer to these as Foundation years, or Year 0, but following in the Medical School's Council categories, we will refer to them solely as Gateway years in this report. Given students on these programmes have met lower admissions criteria to matriculate, these year-long programmes aim to provide sufficient academic and medical experiences, to ensure these students will be successful upon joining SE medicine. Again, there is a fair amount of variability in the structure of these

years, depending on the medical school and their ethos, but coursework typically includes basic sciences (Biology) and study skills support. Additionally, many programmes also include clinical experiences, professionalism coursework, and/or psychology. If students are successful in their Gateway year, passing coursework, they are guaranteed a spot on SE medicine, and matriculate onto the Year 1 cohort. At this point, in almost all Gateway programmes, specialized support that was provided in the Gateway year ceases, and Gateway students continue their medical degree like all other SE students.

There has been a rapid increase in the number of these programmes across the UK since their inception in the early 2000s. The King's College London and University of Southampton have been some of the longest running programmes, but in the last 5 years of entry, there has been an increase from 7 programmes with 2017 entry, to 17 with entry for 2021 medicine (Need to cite MSC entry handbooks here). Despite this rapid expansion, there has been somewhat minimal empirical research on how these programmes function until very recently.

Prior to 2020, the only peer-reviewed information or 'research' related to Gateway years were single-site reports, and largely descriptive (Curtis, Blundell et al., 2014a) (Curtis, Blundell et al., 2014b) (Brown and Garlick, 2007) (Garlick and Brown, 2008), as well as some presentations in conference proceedings in the UK (D'Silva, 2017). These pieces provided some evidence of the 'success' of Gateway years, but certainly demonstrated a paucity in research.

In 2017, the UKMED Advisory Board approved the application for work UKMEDP038, entitled 'How do the professional outcomes of medical graduates from gateway courses compare to graduates from standard entry medicine courses?' (see: https://www.ukmed.ac.uk/accepted_applications). This work described their aims as focusing on undergraduate outcomes, including: exit performance within school used for Foundation programme applications, performance on the ARCP, Royal College medical exams, and for specialty outcomes. The work focused on three schools (Norwich, Southampton, King's College) that had both Gateway and SE programmes, and should have presented sufficient sample size, given these programmes were the longest running in the UK. The work was completed, and publish in January 2020 (Curtis and Smith, 2020). This article is quite extensive, and provides a thorough demographic comparison of Gateway to SE students within these three medical schools; the data includes students who started medical school between 2007 and 2013, and had at least one or more of the graduation outcomes of interest (all students, N=4340; approximately N=560 for Gateway students). The article determines that based on the available data that Gateway courses appeared successful in attracting underrepresented students, compared to the demographics of SE students. And while SE students scored better than Gateway students on undergraduate outcomes, these results were minimised or disappeared when

controlling for attainment on medical school entry. This study also reported attrition rates of Gateway students across their medical education, compared to SE students; there was a higher percentage of attrition amongst Gateway students, compared to SE students, although the details around this were limited, due to the way data is reported.

In considering P038, the findings of the ultimate publication provide some insight of overall success of Gateway programmes in producing doctors. However, with the focus on undergraduate outcomes, there was little exploration of progression measures of students within medical school, beyond attrition numbers. Thus, our team decided to put in an application with UKMED to go beyond the comparison of just SE to Gateway years upon graduation, to give broader consideration to the demographics these students represent. Given the higher percentage of attrition, the progression of Gateway students may be key in reducing these rates, or provide additional insights as to whether attrition rates might be attributed to academic performance, or whether other factors need to be explored.

An application, UKMEDP104, was submitted and approved in 2019, entitled, 'How do students on gateway courses progress through medicine, compared to standard entry peers of similar backgrounds?'. This project aimed to better understand the progression and retention rates of Gateway to Medicine students, compared to students from Standard Entry (SE) medicine programmes. But, as mentioned above, the focus of this work was to not just compare GWY students to all SE students, but focus on the progression of GWY students to students on SE who had similar demographics related to widening participation (WP), but ensured the grades to obtain SE spots. In addition to the information provided by Curtis and Smith (2020), the previous single-site reports also indicated that Gateway year programmes had slightly higher attrition rates for their students, compared to all SE students. Additionally, this work suggested that while Gateway students may perform academically lower than SE peers in preclinical years, they performed as well in clinical years. Thus, the present work aimed to expand upon this, considering progression in more universities, and taking into consideration demographic background. By comparing Gateway students specifically to similar demographic subsets of SE students, this research aimed to examine further the context for understanding progression of Gateway students, and WP students, overall.

The research questions were defined as: Are the academic progression and retention rates of Gateway (GWY) students different, compared to 3 other categories of Standard Entry (SE) students: all SE entry students, SE students who are not considered from a WP background, and SE students who are considered from a WP background?

Methods

Data availability, preparation, and analysis

Upon gaining access to the data, and doing basic preparation to look at data available for Gateway to Medicine programmes, we determined that there was not sufficient data at this point to perform meaningful analysis, as planned, in their current state. The ability to have sufficient data from students who matriculate via Gateway to Medicine programmes is at the crux of the aims of this work, and at this point, there are not enough data to meaningfully add to existing research.

Instead, the 'Results' section presents numbers on the course classification, and the 'Discussion' aims to compare this to broader literature/reports, to describe the key data issues at this point in time.

Results

As mentioned in the methods, the aims of this work surround Gateway to Medicine programmes. Thus, it was this classification that determined the inability to support planned analyses. The current data on these programmes are described in Table 1. A comparison of these data to broader literature, particularly related to sample size and course classification are provided in the Discussion.

Table 1

Medical School	Course Type	
	Gateway to Medicine	Standard Entry
Aberdeen	0	3630
Barts	0	4980
Birmingham	0	6515
Brighton & Sussex	0	1955
Bristol	10	4090
Cambridge	0	5080
Cardiff	0	5170
Dundee	0	1650
Durham	35	1490
Edinburgh	25	4330
Exeter	0	510
Glasgow	0	4640
Hull York	0	1970
Imperial	0	5780
Keele	0	1660
King's	925	6215
Lancaster	0	495
Leeds	0	4315
Leicester	0	3785
Liverpool	0	5230
Manchester	0	6850
Newcastle	0	4170

Norwich	245	1815
Nottingham	0	4525
Oxford	0	2920
Peninsula	0	2055
Plymouth	0	340
Queen's	0	4535
Sheffield	0	4400
Southampton	420	3395
St Andrews	0	2465
St George's	0	3440
The University of Bradford	185	5
UCL	0	6390
UCLAN	0	95
Total	1840	120,870

*Statistical disclosure controls have been applied, as required by the UKMED research process. All Ns are reported to the nearest multiple of 5.

Gateway programmes started in 2001; thus, these numbers reflect all data points in the system with primary medical qualification obtained in no years prior to 2006. This includes all students with data up to 2016, which was the latest data available upon approval of the work, and creation of the project in the database.

Discussion

There are two key issues that presented in the preparation of the data, that do not support planned analysis at this point: number of data points and categorization of medical schools. To understand why both of these are key issues, it is important to understand the data in the wider context of available literature.

Number of Data Points

The first key issue is the limited number of datapoints, with only 1840 Gateway students with data in the UKMED. These are not sufficient data to do planned comparison to similar standard entry students, with a sample size that supports a meaningful analysis.

Part of this issue is the time-scale of provided data in the database. The data available at the time of this analysis only goes up to 2016 entry. This does go beyond the data presented by Curtis and Smith (2020), who included data from 2007 to 2012, because their investigation focused on looking at graduation outcomes. Further, they only looked at three medical schools (King's College, Southampton, Norwich), with the approximate total number of Gateway students included in their study being 560. In the present work, we identified 1590 Gateway students from these institutions, which is nearly

triple. However, this includes all students who have had data added between 2012-2016, but who have not completely progressed to complete their medical degree.

According to the Selection Alliance 2018 Report (Medical Schools Council, 2018b), that includes details on entrant data by course type, between 2007 and 2012, there were 695 Gateway to Medicine entrants; which is similar to the 560 identified by Curtis and Smith (2020), considering they focused on three of the most well established medical schools. The Selection Alliance 2018 Report details that there were 610 students who matriculated via Gateway routes from 2013 to 2016; combined, these total 1305, which is less than the present work, that included students from as far back as 2006. Additionally, Curtis and Smith (2020) only included students with one or more graduation outcomes. Progression throughout medical school, not graduation outcomes solely, were the focus of the present work which could also account for the number discrepancy. Nevertheless, the sample size for the present work, even considering the student data beyond the three schools used by Curtis and Smith, was too small to add any meaningful analysis in comparison to standard entry peers.

Linked to this, there has been a rapid increase in the number of Gateway programmes established since 2016, and thus the number of students matriculating via these routes. In 2017, only seven Gateway programmes existed. By 2018 entry, there were 10, and for 2021 entry, that number has risen to 18 programmes, as identified by the Medical Schools Council Entry Handbooks (Medical Schools Council, 2020). This rapid increase emphasises the importance of understanding the progression of Gateway students, compared to standard entry peers, in under to justify the rapid expansion of these programmes. At this point, there are not sufficient data to explore these aims. However, as the HESA data is refreshed in future years (assessment data for 2020/1 cases may be available for analysis by Q1 2022), it is important that this work is revisited. This is due to the retrospective nature of UKMED data. This retrospective element should be carefully considered in future applications for revisiting this work, and more broadly, in projects related to "new" curricular innovations and changes. The timeline for assessing impact of such changes needs to be considered with understanding the limitations of retrospective data.

Medical School Categorisation

As described above, the second issue that we noted in the initial organisation for this work is the medical school categorisation. This point should be addressed, as it could influence subsequent importation of data.

Course classification in the databased were determined by the MSC and medical schools, and classifications are based on CTITLE in the HESA data dictionary.

In our initial identification, we identified seven medical schools with students who entered on Gateway to Medicine courses by 2016: Bristol, Durham, Edinburgh, King's, Norwich, Southampton and the University of Bradford (though Bradford is unusual, in that it is not a Gateway or SE medical course as such). Comparing these schools to those identified by the Medical School's Council entry guidelines, there are a number of discrepancies. For 2017 entry, the MSC identified seven schools with Gateway years: Bristol, East Anglia, Glasgow, King's, Nottingham, Southampton, and St Andrews (Medical Schools Council, 2017). By 2018 entry (for which data are not available in the database), Bradford, Dundee, Lancaster, and Leicester were added (Medical Schools Council, 2018a), although Glasgow was not included in the handbook (just for the 2018 entry year; the programme was added back for 2019 entry (Medical Schools Council, 2019a)). Table 2 provides details from the MSC Entry Requirement Handbooks, from 2017 through 2021 entry, for Gateway programmes.

Table 2: Medical schools included in the Medical School Council's entry requirement guidebooks (Medical Schools Council, 2017, Medical Schools Council, 2018a, Medical Schools Council, 2019a, Medical Schools Council, 2019b, Medical Schools Council, 2020). The schools with data points in the present work are highlighted in blue, except Durham and Edinburgh (discussed below).

University	2017 Entry	2018 Entry	2019 Entry	2020 Entry	2021 Entry
University of Aberdeen			X	X	X
University of Bristol	X	X	X	X	X
University of Bradford		X	X	X	X
University of Dundee		X	X	X	X
Edge Hill University			X	X	X
University of East Anglia	X	X	X	X	X
University of Glasgow	X		X	X	X
Hull York Medical School			X	X	X
King's College London	X	X	X	X	X
Lancaster University		X	X	X	X
University of Leeds					X
University of Leicester		X	X	X	X
Lincoln Medical School			X	X	X
University of Liverpool			X	X	X

University of Nottingham	X	X	X	X	X
Plymouth University			X	X	X
University of Southampton	X	X	X	X	X
University of St Andrews	X	X	X	X	X
Totals	7	10	17	17	18

Comparing the list of medical schools from the database to the entry requirement details, there are a number of observable discrepancies, listed here by medical school, for ease of communication of issues:

- Durham: Durham is absent from the MSC handbooks, as far back as 2017 entry. This may be accounted for because Durham's programme moved to Newcastle by 2018; prior to their move, the school did include a Gateway programme, which can account for the 35 students documented in the database. However, it is worth noting that this number is never subject to change, which may be key to note for future work; these numbers will also disappear if year of entry is adjusted for. Also of note, as of 2021 entry, Newcastle does not have a Gateway programme.

- Edinburgh: While MSC Entry Handbooks are only publicly available as far back as 2017, Edinburgh has never been listed as having a Gateway year programme, although there standard entry degree is 6-years, similar to most Gateway programmes. This discrepancy, and the 25 data points, should be addressed. It is possible that there was some form of Gateway programme, prior to 2016, accounting for these student records (similar to Durham), but this warrants confirmation, unless these datapoints have been miscategorised.

- Norwich: While a seemingly minor point, Norwich is largely referred to as East Anglia within other MSC documents, such as their entry requirements. While this does not contribute to concerns in the numbers reported, inconsistencies in language and naming may be of confusion in subsequent dissemination of information. This point is not raised anywhere in the Curtis and Smith (2020) report, in the introduction to Norwich medical school.

- Glasgow and St. Andrews: These institutions have no data points. This may be because of the newness of their programmes. Although there are no MSC Entry data for prior to 2017, it is possible this was the first year of these Gateway programmes, meaning there would be no data points identified in the present analysis, which only extends to 2016, or the available data. However, if these institutions had Gateway years established prior to 2016, this is an issue, as their data are missing. Given the relatively small number of places for Gateway programmes, compared to Standard Entry, nationally, having complete datasets is crucial to future work.

- Bradford: The final point about discrepancies is about a potential miscategorisation of schools, most notably, the University of Bradford, and the issues around its datapoints, both current and future. Bradford yielded 185 Gateway students and 5 standard entry students. While this may seem unusual, this is because Bradford does not have their own medical school, yet students can still matriculate onto their 'Foundation in Clinical Sciences/Medicine' course, then occasionally move to standard entry medicine at a Medical School (possibly Sheffield or Leeds). However, this does not account for the 'standard entry' students; as Bradford does not have a standard entry medicine programme; these data points should not exist. Further, the categorisation of the Bradford students as 'Gateway' students complicates matters in tracking students and their progression. While Bradford does have a partnership established with Sheffield, their website denotes that students may also apply to other medical schools. This could lead to discrepancies in how these students are reported and tracked in the UKMED. Additionally, unlike with other Gateway programmes, successful completion of the Bradford Foundation year does not guarantee a place on any standard entry course with ease. Students must re-apply via UCAS for entrance to Sheffield, or other medical schools. This alters the traditional pathway from being a Gateway medical student to Standard entry student. *Thus, the categorisation of Bradford as a true 'Medicine with a Gateway year' by the MSC warrants revisiting.* While pursuing a medical degree is an emphasis of Bradford's programme, and it aims to support widening participation students, medicine is not the only pathway provided to these students. Per their website, graduates from this programme can also progress to a variety of other healthcare careers, and indeed more commonly do. Again, this creates issues in the UKMED system, as this programme is not actually designed to solely support progression within medicine. While this programme has been described as a 'Gateway programme' for years, this should be revisited, as this categorisation is an oversimplification and could lead to issues in truly understanding the function of this particular programme, compared to all other 'true' Gateway years.
  - Liverpool: In the same vein of issue as Bradford, the categorisation of Liverpool's entry routes in future data reporting should be carefully considered. While their 'Gateway' programme was not established until 2019 entry, and is therefore not represented in the present work's dataset, in future reporting they may provide Gateway student data points. However, this will provide similar issues to Bradford. The Liverpool programme is described as a 'Foundation to Health and Veterinary Studies (Year 0)', and while like Bradford, it can lead to a Medical degree, this is not an exclusive option, and a variety of routes to healthcare positions are offered. While their

application does require that students need to select one career option (ie- Medicine), the educational experience is varied. Gateway students who opt for the Medicine route are grouped with students who opted for Dentistry and Dental therapy, and the curriculum reflects this variety. Another key issue with Liverpool is their target applicants. This programme specifically aims to recruit mature students (Medical Schools Council, 2020), not school leavers, as is the norm in all other Gateway years. This leads to much larger variance in prior attainment, which is often used is analysis of subsequent performance. While it is important that all medical students are accounted for in UKMED, Liverpool does not function like the majority of Gateway year programmes, and any subsequent analysis may find it key to note this. Their categorisation as a 'Gateway year' should also be revisited.

Conclusion

While unfortunately unable to provide the planned analysis, it is our hope that the present report provides justification for this, and makes some key points about data reporting that could influence future work. At present, meaningful analysis to compare Gateway students progression to standard entry peers of similar and dissimilar WP backgrounds is not possible. In order to add any perspective to the undergraduate outcome work completed by Curtis and Smith (2020), more retrospective data is needed. Additionally, we noted a number of discrepancies in details provided in the database for a number of medical schools, compared to widely available data from the MSC. While these might seem minute, given the limited number of data points, proportionally, these could lead to much larger issues in analysing and understanding the function of Gateway years. These programmes have rapidly expanded in recent years, but require intense resourcing from medical schools and serious commitment from students. In order to truly appraise their value in supporting widening participation and access, there needs to be high quality and clear reporting of student data related to these programmes. With sufficient data, and an increase in the number of datapoints, we hope that this work can be revisited and analysis performed in the future.

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Appendix C: Anatomy Outreach Initial Participant Survey

The following are screenshots of the survey was used in initial stages of recruitment for the Anatomy Outreach work of this thesis (Chapter 7). The survey was disseminated electronically via Google Forms.

Anatomist Views on Outreach Activities

Thank you for your interest in participating in our study on anatomists views on outreach activities. Please complete this form to register your interest.

The first section includes consent statements; please read the Information Sheet (here: https://docs.google.com/document/d/1IWqDl1ZHBfjzRpdYFEL0vdjWLfvxQQONcq95nxNq T5E/edit?usp=sharing) prior to consenting.

The second portion requests your name, email, current role, institution, and a bit of background on your anatomy outreach experiences. Upon completion, the primary researcher will contact you via the email you've provided

*Required

.   By checking 'Yes' to each of the following items, you are providing 'Informed Consent' for this study, and agree to be contacted upon completion of Section 2 of this survey. *

Tick all that apply.

	Yes
I confirm that I have read the Information Sheet in its entirety, and understand its contents.	☐
I confirm that I have had the opportunity to contact the primary research and ask questions about my involvement in this study.	☐
I understand that participation in this study is completely voluntary, and that I am free to withdraw at any point, without reason or excuse, and that withdrawal will result in the destruction of my existing data.	☐
I understand that my completing this survey, I am consenting to be contacted about setting up a 30-60 minute Zoom interview.	☐
I understand that my Zoom interview will be recorded, and that any recordings will be securely stored, and transcribed.	☐
I consent to be a participant in this study.	☐

Your Details & Anatomy Outreach Experience

This section asks for your contact details, so that the primary researcher can set up and interview with you, via email. We also request a bit of background on your anatomy outreach experiences. We are particularly interested in outreach focused on widening participation.

We define 'outreach' as any activity aimed at providing an anatomy educational experience to a population that might not otherwise have access to such an experience. 'Widening participation' includes activities aimed at increasing the rates of application and matriculation of traditionally underrepresented groups into higher education.

2. Your Name

_____

3. Email *

_____

4. Current Role

_____

5. Institution

_____

6. Please describe the way(s) in which you've been involved in anatomy outreach programmes.

_____

_____

_____

_____

_____

Appendix D: NPT Initial Survey (Part 1)

The following is the content of the survey used to gather data from the NPT work,

Part 1 (Chapter 8). The survey was disseminated electronically via a University of

York-associated Qualtrics account.

Gateway to Medicine - Faculty Views Survey

Start of Block: Survey Information & Consent Statement

This survey is designed to help get a better understanding of how to apply and
integrate interventions. While typically used with health interventions, this has been
adapted from its original form to apply to health education. We are using this to
evaluate the Gateway Year of the MBBS within Hull York Medical School.

This survey is 6 parts, and we estimate it will take approximately 25-30 minutes.
Section 1 asks some brief questions about you and your role with the medical school.
These responses will be kept confidential and appropriately anonymised in any
dissemination of the data. Section 2 includes general questions about the Gateway
Year, as part of the MBBS. Section 3 contains more detailed questions about the
Gateway year. For each part in Section 3 there will be agree/disagree statements,
but also the option to state if you feel an item is not relevant to you, and open ended
items.

If you have any questions at all, please contact the primary researcher, Angelique
Duenas, at hyad29@hyms.ac.uk

*(Survey Modified from: Finch, T.L., Girling, M., May, C.R., Mair, F.S., Murray, E.,
Treweek, S., Steen, I.N., McColl, E.M., Dickinson, C., Rapley, T. (2015). NoMad:
Implementation measure based on Normalization Process Theory. [Measurement
instrument]. Retrieved from http://www.normalizationprocess.org.)*

I have read through the information sheet and had appropriate opportunities to
contact the primary researcher with questions. I understand that participation in this

study is voluntary, and that I am free to withdraw at any point by not completing this survey. By clicking 'I consent' below, I am providing informed consent to participate.

○ I consent

From the statements below please choose an option that best describes your main role in relation to the Gateway year:

○ I am involved in managing or overseeing the Gateway Year

○ I am involved in delivery of the Gateway Year

○ I don't feel I am directly involved with the Gateway Year

○ Other _____

Which campus are you based at?

○ Hull

○ York

How many years have you worked for Hull York Medical School?

○ Less than 1 year

○ 1-2 years

○ 3-5 years

○ 6-10 years

○ More than 10 years

How would you describe your professional job category and role within the entirety of the medical school?

_____

_____

_____

_____

_____

How long have you been involved with the Gateway to Medicine year at HYMS? (estimated)

○ Less than 1 month

○ 1-6 months

○ 7-12 months

○ 1-1.5 years

○ 1.6-2 years

○ More than 2 years

○ No direct involvement

How would you describe your professional job category and role within the Gateway year, or as it relates to the Gateway year?

_____

_____

_____

_____

_____

For the remainder of this survey, please answer all the statements from the perspective of the role that relates most to the Gateway Year. Depending on your role, some statements may be more relevant than others.

End of Block: Section 1: About Yourself

Start of Block: Section 2: General questions about the Gateway Year

The first question relates to your view of the Gateway year from your previously identified primary role with the Gateway year.

	Still feels very new	Feels completely familiar
	0 1 2 3 4 5 6 7 8 9 10	

| When you talk about the Gateway year, <u>how familiar</u> does it feel? | |

Please consider your work for the Gateway year, in context to your overall role in the medical school.

	Not at all	Somewhat	Completely
	0 1 2 3 4 5 6 7 8 9 10		

| Do you feel the Gateway Year is <u>currently</u> a normal part of your work? | |
| Do you feel the Gateway Year <u>will become</u> a normal part of your work? | |

End of Block: Section 2: General questions about the Gateway Year

Start of Block: Section 3: Views on Gateway Year

Please select an answer that best suits your experience from Option A. If the statement is not relevant to you or your work, please select an answer from Option B that explains why.

	Option A					Option B		
	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Not relevant to my role	Not relevant at this stage/time	Not relevant to the Gateway year
I can see how working on the Gateway year differs from usual ways of working	○	○	○	○	○	○	○	○
Staff in the medical school have a shared	○	○	○	○	○	○	○	○

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understanding of the purpose of the Gateway year								
I understand how the Gateway year affects the nature of my own work in the medical school	○	○	○	○	○	○	○	○
I can see the potential value of the Gateway year for my work in medical education	○	○	○	○	○	○	○	○

Can you please describe your understanding of the strategic purpose of the medicine with a Gateway Year programme within Hull York Medical School?

_____

_____

_____

_____

_____

End of Block: Section 3: Views on Gateway Year

Start of Block: Section 4: Group Participation in Gateway Year

Please select an answer that best suits your experience from Option A. If the statement is not relevant to you or your work, please select an answer from Option B.

	Option A					Option B		
	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Not relevant to my role	Not relevant at this stage/time	Not relevant to the Gateway year

There are key people who drive the Gateway year forward and get others involved	○	○	○	○	○	○	○	○
I believe that contributing to the Gateway Year is a legitimate part of my role in the medical school	○	○	○	○	○	○	○	○
I'm open to working with colleagues in new ways to approach the Gateway year	○	○	○	○	○	○	○	○
I will continue to support the Gateway year	○	○	○	○	○	○	○	○

What are the personal benefits or costs to your participation in the Gateway year?

_____

_____

_____

_____

_____

Please select an answer that best suits your experience from Option A. If the statement is not relevant to you or your work, please select an answer from Option B.

	Option A					Option B		
	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Not relevant to my role	Not relevant at this stage/time	Not relevant to the Gateway year
I can easily integrate the Gateway year into my existing work	○	○	○	○	○	○	○	○
The Gateway year disrupts working relationships	○	○	○	○	○	○	○	○
I have confidence in other people's ability to contribute to the Gateway year	○	○	○	○	○	○	○	○
Work is assigned to those with skills appropriate to being involved with the Gateway year	○	○	○	○	○	○	○	○
Sufficient training is provided to enable staff to work on the Gateway year	○	○	○	○	○	○	○	○
Sufficient resources are available to support the Gateway year	○	○	○	○	○	○	○	○
Management/Leadership adequately supports the Gateway year	○	○	○	○	○	○	○	○

Please reflect on how the Gateway year has: a) been reflected in your workload model, and b) resource planning and allocation.

_____

_____

_____

_____

_____

End of Block: Section 5: Actions of the Gateway Year

Start of Block: Section 6: Reflection on the Gateway Year

Please select an answer that best suits your experience from Option A. If the statement is not relevant to you or your work, please select an answer from Option B.

	Option A					Option B		
	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Not relevant to my role	Not relevant at this stage/time	Not relevant to the Gateway year
I am aware of updates on the progress of the Gateway Year	○	○	○	○	○	○	○	○
Staff agree that the Gateway year is worthwhile	○	○	○	○	○	○	○	○
I value the effects that being involved with the Gateway year has had on my work	○	○	○	○	○	○	○	○
Feedback about the Gateway year can be used to improve it in the future	○	○	○	○	○	○	○	○

| I can modify how I work within the Gateway year | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Please discuss your perceived value of the Gateway year as it becomes an element of standard practice within Hull York Medical School.

_____

_____

_____

_____

_____

End of Block: Section 6: Reflection on the Gateway Year

Start of Block: Survey Completetion

Thank you for taking the time to complete all the previous focused questions about the Gateway year. Any additional views/comments may be expressed here:

_____

_____

_____

_____

_____

End of Block: Survey Completion

Appendix E: NPT Findings/Follow-Up Slides

The following are screenshots of slides used to disseminate findings from the initial NPT (Part 1); these were used in a recorded presentation that was sent to participants with the follow-up survey (Appendix F). This work relates to Chapter 8 of this thesis.

Appendix F: NPT Follow-Up Survey (Part 2)

The following is the content of the survey used to gather follow-up data from the

NPT work, Part 2 (Chapter 8). The survey was disseminated electronically via a

University of York-associated Qualtrics account.

Gateway to Medicine - Faculty Views Survey - Follow Up

This survey is to follow up with our research project evaluating the Gateway Year of the MBBS within Hull York Medical School. This survey is designed to be answered after watching the short presentation disseminating findings from the initial part of this work. That presentation can be found here, and in the email about this project.

This survey is 3 parts, and we estimate it will take approximately 10-20 minutes. Section 1 asks some brief questions about you and your role with the medical school. These responses will be kept confidential and appropriately anonymised in any dissemination of the data. Section 2 includes general questions about the Gateway Year, as part of the MBBS. Section 3 contains more detailed questions about the Gateway year, asking for you to reflect on the 4 'take-aways' from research, up to this point. These all ask about level of agreement or disagreement with findings, and why.

If you have any questions at all, please contact the primary researcher, Angelique Duenas, at hyad29@hyms.ac.uk

(Original Survey Modified from: Finch, T.L., Girling, M., May, C.R., Mair, F.S., Murray, E., Treweek, S., Steen, I.N., McColl, E.M., Dickinson, C., Rapley, T. (2015). NoMad: Implementation measure based on Normalization Process Theory. [Measurement instrument]. Retrieved from http://www.normalizationprocess.org.)

I have read through the information sheet (can be accessed here) and had appropriate opportunities to contact the primary researcher with questions. I understand that participation in this study is voluntary, and that I am free to withdraw at any point by not completing this survey. By clicking 'I consent' below, I am providing informed consent to participate.

○ I consent

From the statements below please choose an option that best describes your main role in relation to the Gateway year:

○ I am involved in managing or overseeing the Gateway Year

○ I am involved in delivery of the Gateway Year

○ I don't feel I am directly involved with the Gateway Year

○ Other _____

Which campus are you based at?

○ Hull

○ York

How many years have you worked for Hull York Medical School?

○ Less than 1 year

○ 1-2 years

○ 3-5 years

○ 6-10 years

○ More than 10 years

How would you describe your professional job category and role within the entirety of the medical school?

_____

_____

_____

_____

_____

How long have you been involved with the Gateway to Medicine year at HYMS? (estimated)

○ Less than 1 month

○ 1-6 months

○ 7-12 months

○ 1-1.5 years

○ 1.6-2 years

○ More than 2 years
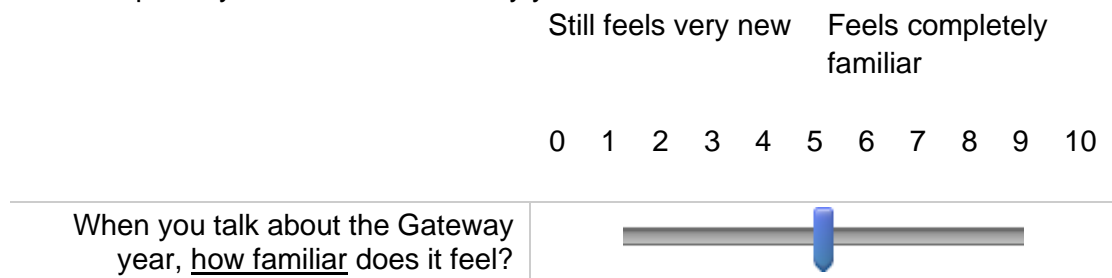
○ No direct involvement

How would you describe your professional job category and role within the Gateway year, or as it relates to the Gateway year?

_____

_____

_____

_____

For the remainder of this survey, please answer all the statements from the perspective of the role that relates most to the Gateway Year. Depending on your role, some statements may be more relevant than others.
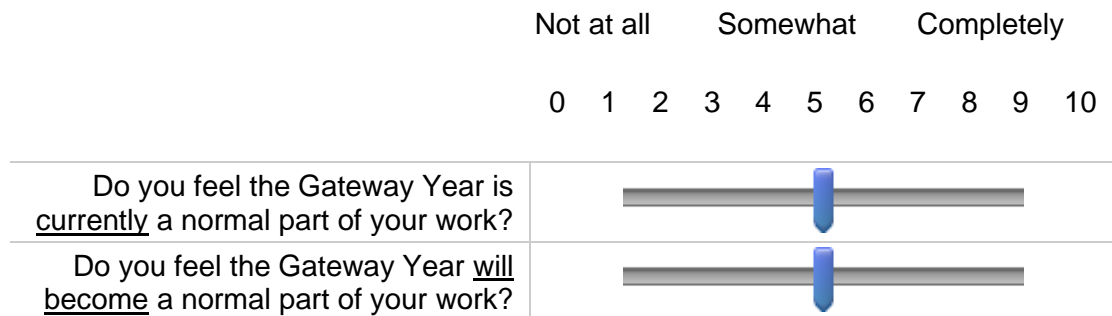
The first question relates to your view of the Gateway year from your previously identified primary role with the Gateway year.

	Still feels very new	Feels completely familiar
	0 1 2 3 4 5 6 7 8 9 10	
When you talk about the Gateway year, <u>how familiar</u> does it feel?		

Please consider your work for the Gateway year, in context to your overall role in the medical school.

	Not at all	Somewhat	Completely
	0 1 2 3 4 5 6 7 8 9 10		
Do you feel the Gateway Year is <u>currently</u> a normal part of your work?			
Do you feel the Gateway Year <u>will become</u> a normal part of your work?			

Take-Away 1: Participants appreciated the shared meaning and purpose of the Gateway year as a means of widening participation & access – but this appreciation may not be shared widely across the school (coherence).
 Do you agree or disagree with this perspective, and why?

_____

_____

_____

_____

Take-Away 2: Those involved in the Gateway year said they will continue to engage in the work and support in the Gateway year (cognitive participation).
 Do you agree or disagree with this perspective, and why?

_____

_____

_____

_____

_____

Take-Away 3: There are concerns about the integration of Gateway-related work into other workload for the medical school. There is also concern whether sufficient resources and training are provided to support those working on the Gateway, and whether management / leadership fully supports it (collective action).
 Do you agree or disagree with this perspective, and why?

_____

_____

_____

_____

_____

Take-Away 4: Some participants in the previous survey felt they do not get regular updates or have an understanding of how the Gateway year is functioning (reflexive monitoring).
 Do you agree or disagree with this perspective, and why?

_____

_____

_____

_____

_____

Lastly, do you have any recommendations or suggestions for addressing any of the aforementioned concerns?

_____

_____

_____

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_____

End of Block: Section 3: Views on Gateway Year

Start of Block: Survey Completion

Thank you for taking the time to complete all the previous focused questions about the Gateway year. Any additional views/comments may be expressed here:

_____

_____

_____

_____

_____

Would you be interested in participating in a focus group / think tank about implementing the Gateway year within HYMS, based on this research? If so, please provide your contact email here. The research team will follow up if there is sufficient interest expressed.

_____

_____

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End of Block: Survey Completion

Appendix H: Student Experiences Qualitative Survey

The following are screenshots of the survey was used in initial stages of recruitment and data collection for the Gateway student experiences work of this thesis (Chapter 9). The survey was disseminated electronically via Google Forms.

Student Gateway Survey

Thank you for taking the time to complete this survey. By completing this survey you are providing consent for us to use your responses and demographic data for our research project and associated publications. You are confirming that you have read the below information sheet (link provided), had any opportunity to ask questions, and have had them answered. You are free to withdraw from this study at any time, and not complete this survey.

This study aims to ask a few questions about your Gateway programme experiences. Please fill out all items to the best of your ability, it should take 15-30 minutes. Participation is voluntary and all responses will be treated anonymously and confidentially. If you include contact information to volunteer in an additional interview regarding experiences, your email will be used to contact you regarding interview participation.

Completion of the survey will enter you in a drawing for one of three £50 Amazon vouchers- winners will be contacted by email. If you volunteer and are selected to interview, participants will also be offered a £10 Amazon voucher, in addition to being entered in the survey drawing, as time compensation.

The information sheet regarding more details about the study can be found here. Please read prior to completing the survey:
https://docs.google.com/document/d/1Z9T7h0M6G8ZKTtJOyITdd3AsLggditIO6Q2yYREdYfI/edit?usp=sharing

Questions? Please contact the primary researcher: Angelique Duenas at hyad29@hyms.ac.uk

Thank you!!

*Required

Demographic Questions
This first set of questions is regarding some basic information about you. Please answer to the best of your ability.

1. What medical school are you studying at, or did you earn your degree from? *

2. Which of the following best describes where you are in your training or practicing? *

Tick all that apply.

☐ Year "0" of Medical School (currently in your Gateway Year)
☐ Year 1 of Medical School
☐ Year 2 of Medical School
☐ Year 3 of Medical School
☐ Year 4 of Medical School
☐ Year 5 of Medical School
☐ Foundation Year 1
☐ Foundation Year 2
☐ GP Training Programme
☐ Specialty Training
☐ General Practitioner
☐ Consultant
Other: ☐ _____

3. If you selected 'Other' in the previous question, please elaborate:

_____

4. Would you consider your current location (where you live, study, or practice medicine) to be in close proximity to the region in which you grew up?

Mark only one oval.

◯ Yes
◯ No
◯ Unsure

5. Email address (If you wish to be entered in the drawing for a £50 Amazon Voucher- will be treated confidentially.)

_____

Gateway Year Experiences
This next set of questions deals with experiences about your Gateway year- please be as detailed as possible.

6. Some medical schools have many sessions to support widening participation in medicine. For example, some hold: Pathway programmes, summer programmes, work experience set-up, application/mock-interview assistance, "discovery" day, or others. Prior to starting your Gateway year, did you participate in any type of these sessions? If so, please elaborate.

7. Reflect upon your integration from your Gateway Year into Year 1 of Medical School (this may be already experienced, or anticipatory). Please describe the experience, including any sense of stigma or support that may have impact.

8. In the space below, please write a "love letter" to your Gateway Year programme. Mention all the things you love, and appreciate about your programme. You may structure it however you like, but we suggest completing this opening, "Dearest Gateway Year... I must confess all the reasons I adore you..."

9. Now in the space below, please write a "break up letter" to your Gateway Year programme. Mention all the things you hate, and wish your programme would change. You may structure it however you like, but we suggest completing this opening, "Hello Gateway Year... We need to talk..."

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Interview Volunteer Opportunity

This last set of questions is regarding the opportunity to also participate in a phone-interview for further data collection. If you select your interest, please list an email address that is best to reach you at, and we will be in contact shortly.

10. Would you be interested in participating in a phone interview (about 30 minutes) regarding your Gateway programme experiences?

Mark only one oval.

◯ Yes

◯ No

◯ Maybe

11. Best email address to contact you regarding setting up a phone interview:

_____

Thank you for participating!

This last section is simply if you have any other comments you would like to make regarding your experiences, or about the study.

List of Abbreviations

A-Levels – Advanced-level (of General Certificate of Education)

BAME – Black, Asian, and Minority Ethnic

BMAT – BioMedical Admissions Test

BME – Black Minority Ethnic

CCGs – Clinical Commissioning Groups

COVID-19 – coronavirus

DEI – Diversity, Equity, and Inclusion

EDI – Equity, Diversity, and Inclusion

EMDP – Extended Medical Degree Programme

EPM – Educational Performance Measure

GCSE – General Certificate of Secondary Education

GAMSAT – Graduate Medical School Admissions Test

GAP – Glasgow Access Programme

GT – Grounded Theory

HE – Higher Education

HPE – Health Professions Education

HYMS – Hull York Medical School

IMD – Indices of Multiple Deprivation

MCAT – Medical College Admissions Test

MMI – Multiple Mini Interview

MSC – Medical Schools Council

NHS – National Health Service

NPT – Normalisation Process Theory

NS-SEC – National Statistics Socioeconomic Classification

O – Outreach

POLAR – Participation of Local Areas

PSA – Prescribing Safety Assessment

R – Retention

S – Selection

SciComm – Science Communication

SE – Standard Entry

SEC – socioeconomic

SJT – Situational Judgement Test

STEM – Science Technology Engineering and Math

TA – Thematic Analysis

UCAS – Universities & Colleges Admissions Service

UCAT – University Clinical Aptitude Test (current name)

UKCAT – UK Clinical Aptitude Test (former name)

UK – United Kingdom

UKMED – UK Medical Education Database

URiM – Underrepresented in Medicine

URM – Underrepresented Minority

USA – United States of America

WA – Widening Access

WEX – Work Experience

WP – Widening Participation