A Critical Realist Perspective on Lesson Study

This thesis is submitted for the degree of Doctor of Education (EdD) by

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Declaration

This thesis is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared in the Preface and specified in the text. I further state that no substantial part of my thesis has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. It does not exceed the prescribed word limit for the relevant Degree Committee (80,000 words excluding figures and references).
Abstract

Lesson study consists of the collaborative design, observation, and discussion of a series of lessons, centred around an explicit educational goal. This creates a cyclical and contextualised approach to professional development with the potential to spur teacher improvements which can in turn lead to improvements in student learning in a manner which is relevant and reactive to the demands of society.

This study aims to contribute to both professional practice through the adaptation of lesson study, and to theory, through a critical realist approach to professional learning. The literature and my personal experiences are used to highlight various issues with lesson study implementation indicating it might not be sustainable within the English secondary school context. Through the lens of critical realism, these issues are explored, and some potential solutions are crafted and evaluated. Interviews are used to capture the experiences of seven teachers as they engage in multiple lesson study cycles over two academic years. The qualitative data is then analysed to draw inferences about the potential causal mechanisms which enable the teachers to exercise their powers and to enact change to their practices, against their various contextual constraints.

The final abstraction of the research is a sociological model of professional learning informed by Margaret Archer’s social morphogenesis, which provides a theoretical framework for capturing changes within social systems. This model is predicated on the idea that changes to teaching practice are reflexively negotiated in relation to a teacher’s unique social circumstances. Teachers then turn professional learning into action/inaction through reflexivity by drawing from their existing knowledge, dispositions, and beliefs. It is posited that teachers’ reflexive actions are predisposed by their developmental capacity, defined by their specific stance towards professional development as well as objective factors such as time and energy and resulting in varying levels of engagement with professional development mechanisms such as lesson study. By capturing the
diversity of teacher identities and defining their abilities to deal with contextual challenges, teacher developmental capacity provides a useful means of enhancing the effectiveness of professional development activities. The ultimate outcomes of professional learning under this model are conceptualised as a ‘double morphogenetic cycle of teacher change’, whereby changes can materialise both internally to the teacher and socially, through their practice, and opportunities for reflexive deliberations are central to nurturing positive teacher change.

This research attempts to position effective professional development as the vehicle for educational change which begins in the classroom but demonstrates the potential to transform schools by enabling teachers to develop and transfer their knowledge/beliefs (what they know) to their practice (how they teach). As well as practical recommendations for teachers, school leaders and policymakers, the realist development and evaluation of a professional development programme centred on lesson study also provide frameworks and analytical tools which could be applied as part of programme and policy evaluation, both across, and beyond the field of education.
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PART I.
INTRODUCTION
1. Overview

This research is concerned with the practice of lesson study as part of the professional development of mathematics teachers. It attempts to improve the implementation of lesson study for English secondary schools and to develop the conceptual understanding of lesson study and professional learning, through critical realism. Thus, this thesis, submitted as part of a doctorate in education, represents a contribution to both practical knowledge and to theory.

Lesson study is generally organised around a research lesson or series of research lessons, following the principles which emerged in Japan in the 19th century (Isoda, 2007). It is an iterative reflective process which aims to create knowledge as well as improving practice, usually beginning with the identification of research questions, centred on an educational ideal. This is followed by the planning of the research lesson, its teaching and observation, and finally, reflection and sharing of feedback (Fernandez, 2002).

Lesson study was given considerable attention by Stigler and Hiebert (1999) in their comparative study of American and Japanese educational systems where they suggested that it was central to the success of Japanese mathematics and science teaching. It is from about this time that interest in lesson study developed in the west, particularly in the USA, although often a somewhat simplified model of lesson study was being implemented. Two decades after Stiegler and Herbert, an ever-growing World Association of Lesson Study, countless national and local offshoots, as well as a wealth of literature (mostly small case studies but increasingly more ambitious in scope) attest to the growing popularity of lesson study. However, in its transition to the west and into diverse educational contexts, some instances of implementation have been deemed shallow or onerous (Takahashi & McDougal, 2016) and the importation efforts into England have not been sustained. Despite these issues, the practice of lesson study continues to meet many standards for effective professional development (Collin & Smith, 2021) and is professed to benefit teacher knowledge and teacher beliefs and to improve instructional tools/resources, routines/norms of learning and student learning (Dudley et al., 2019).
As a practitioner/researcher I began the investigation of lesson study in 2013, following my experience as a member of a lesson study planning group devising strategies to improve students’ mathematical problem-solving skills. As I took part in and observed multiple lesson study cycles, I became aware that there were many contextual factors negatively affecting the way in which lesson study could be and was being implemented, including imbalances in group dynamics affecting the outcomes, unrealistic time requirements which seemed unsustainable and lack of follow-through from discussions which failed to translate the learning from lesson studies into changes in practice. While my initial research interests were in the qualitative evaluation of the effectiveness of lesson study in developing mathematics teaching, my focus soon shifted to unravelling these contextual difficulties. My resulting research questions were: how can the implementation of lesson study be adapted in order for effective professional development to take place? and how do teachers adapt their practice as a result of participation in lesson study?

To begin to answer these questions, I had to first address the conceptualisation of lesson study and professional learning more generally. To achieve this, I required a theoretical framework which would be inclusive of the contextual factors and their effects in affecting change as a result of participation in professional development activities. Critical realism (Archer, 1995; Bhaskar, 1975) provides an approach to conceptualising the social world on the basis of reflexivity, which is seen as both a response to and an influence on existing cultures and structures. By using critical realism, it was possible to begin to comprehend the relationship between existing practices, a professional development programme like lesson study, and teachers’ thinking and their identities. This was important in understanding how lesson study is not only sensitive to context but is entirely shaped by it.

The resulting empirical study is broadly consistent with an action research approach, with repeated cycles of implementation, data collection, analysis, and re-implementation in an adapted way. Its main claims are as follows:
1. The effectiveness of lesson study (and other professional development practices) is predicated by a teacher’s developmental capacity. This is based on their unique constellation of objective constraints as well as their subjective stance towards engagement in these developmental practices.

2. School leaders can enhance teachers’ developmental capacity by creating supportive structures and nurturing cultures which address diverse professional development needs. A holistic and context-specific approach, such as the one presented, can lead to more sustainable teacher development.

3. Effective professional development mechanisms, such as lesson study, support reflexive deliberations on teacher practice by drawing on existing knowledge, skills, dispositions, and beliefs as well as allowing exposure to new knowledge and experiences. This process of teacher change is a double morphogenetic cycle: it metamorphoses as both internal personal change and external social change.

These claims suggest a more teacher-centric approach to professional development, whereby effective mechanisms such as lesson study are curated into context-relevant programmes. It is proposed that with the right support and challenge at each step of a teacher’s professional development journey, schools will be able to tap further into their workforce potential and to better meet the constantly evolving needs and demands of society.

**Thesis Structure**

This research is entirely grounded in its context. The contextual challenges I have experienced have informed my decisions along the way and it is the contextual requirements which the research hopes to serve. Chapter 2 therefore begins the thesis with an in-depth critique of my experiences of lesson study implementations and begins to find reason to adapt lesson study for the English secondary school by relating these practical elements to broader structural and systemic issues. The needs of the research setting are then reviewed to establish some key contextual requirements and to shape the research purpose.
The literature review comprises of Chapters 3 and 4, exploring lesson study and teacher professional development respectively. In the former, I provide some background to lesson study through a brief outline of its history and of current lesson study research trends. Significant studies are recounted and significant constructs such as teacher knowledge, beliefs, dispositions, and self-efficacy are identified as potential empirical indicators of teacher change. Relating back to the contextual realities, this chapter concludes with a summary of problematic aspects of the literature, noting the unmitigated effects of fundamental differences in approaches to curriculum, professional development, and lesson study implementation, and therefore casting doubt on the use of the Japanese format of lesson study as a comprehensive solution to the professional development needs of English teachers.

Chapter 4 provides a critical assessment of major contributions to the theorisation of professional learning, such as Shulman’s (1987) pedagogical content knowledge, Schön’s (1990) reflective practitioner, Lave and Wenger’s communities of practice (1991) and Bandura’s (1977) social learning theory. Like its predecessor, this chapter concludes with a critique of these theories in terms of their unsuitability for the purpose of this research. These do not provide the means to conceptualise the contextual elements of lesson study nor to capture the process through which new learning gained from participation in lesson study translates into changes in practice and norms. Thus, the justification is laid for the theoretical framework, which is introduced in chapter five.

Chapter 5 presents the ontology of critical realism, and within it, social morphogenesis, as defined by Archer (1995), as a theoretical framework to explore teacher change. Her concepts of structure, agency and culture are seen to interact temporally in cycles to either generate change (morphogenesis) or to maintain the status quo (morphostasis). Lesson study is approached from this stance to focus on its emergent causal properties, and a proposition is formed: “applying the lesson study methodology develops elements of teaching (research-based teaching strategies and solutions developed through collaborative design) and enables teachers to refine existing or to develop new pedagogic dispositions”.
The methodology in Chapter 6 is based on Bhaskar’s (1975) ontologically stratified interpretation of social phenomena, whereby empirically observable events can be explained using causal mechanisms as manifestations of underlying causal properties. This forms the conceptual framework which frames the data collection and analysis plans. The aforementioned proposition is acknowledged to be mediated by an agent’s reflexive discourse; therefore, reflexivity becomes the cornerstone of the epistemology. The resulting action research approach uses semi-structured interviews to glean the reflexive processes of teachers as they engage with instances of lesson study over a period of two academic years.

In Chapter 7, the findings are presented in two phases, differentiated with a distinct action plan denoted as ‘Methodology 2.0’. These are analysed through abductive reasoning whereby the underlying causes behind the data are inferred. Informed by the first phase, more rigorous solutions are crafted to further embed lesson study into the developmental practices of the mathematics teachers and to address the issue of lesson study as an incomplete solution to the professional development needs of teachers in the English secondary school context. This lesson study implementation approach takes the form of a ‘Proactive Professional Development’ framework. This is proactive in its quest for teacher improvement in the same broader way that lesson study is: by engaging the power of collaborative enquiry for the design of pragmatic solutions towards the achievement of ambitious educational goals. This approach extends the support structures often reserved for new teachers by encouraging a continuous, multi-modal, and multi-perspectival approach to professional development with lesson study at its core and with the specific needs of the teachers in mind.

Chapters 8 and 9 discuss the practical (‘How can the implementation of lesson study be adapted in order for effective professional development to take place?’) and the theoretical (‘How do teachers adapt their practice as a result of participation in lesson study?’) research questions respectively. In the former, lesson study is adapted for practice by broadening its definition, providing a template for implementation and a means of evaluating the effectiveness of its instances. Essentially, the focus is shifted from the lesson study parts to the overall objectives and
their causality on the teachers, school structures and team culture. By positioning lesson study as the proactive core of effective professional development, a more open and flexible approach to lesson study is suggested to enable its better integration within English secondary schools.

In Chapter 9, the data is further abstracted to capture the individuality of teachers’ professional development needs retroductively through the construct of ‘teacher developmental capacity’. This incorporates the contextual social elements affecting a teacher’s capacity to engage with professional development activities, as well as their beliefs and dispositions informing their temporally defined stance on professional learning. This concept forms the basis for the recommendation of this teacher-centric approach to professional development.

This chapter culminates in the final formulation of teacher change as a result of participation in professional development activities. This process of change begins with the discernment of an opportunity for change, which is reflexively deliberated in relation to one’s existing beliefs and concerns, to determine a course of action/inaction. Through reflexivity, internal aspects such as knowledge, skills, dispositions, and beliefs are engaged to interpret experiences and inform actions and habits. This is based on the interaction phase of Archer’s (2013) morphogenetic cycle and presented as a double morphogenetic model for teacher change, which encapsulates both social change (through structures and teaching practice) and personal change (internal to the teachers). It is proposed that effective professional development practices such as lesson study support the reflexive deliberations central to this model of teacher change and that the lesson study collective has the enhanced potential to affirm positive teacher dispositions and nurture teacher developmental capacity.

Thus, the thesis presents a novel application of critical realism to the field of professional learning, through the developmental mechanism of lesson study. A realist conceptualisation of lesson study captures its broader features in terms of their potential to affect individuals, structures, and cultures in schools. A specific programme which applies this broadened definition is enacted and evaluated using processes which can be replicated across other contexts. By
codifying the developmental capacity of teachers, their diverse professional developmental needs are recognised and attended to through personalised structures and processes. These actions ultimately result in a more sustainable and emancipatory approach to professional development, rooted in its context but with generalised frameworks for implementation.

**Research Principles**

Further to the aims and objectives which are gradually introduced in the first few chapters, this work rests on some key research principles. These can be thought of as guidelines, which although not an academically rigorous aspect of the ontology or epistemology, certainly inform both, similarly to a mission statement:

(i) ‘In ultimate service to the students’, this motto is echoed throughout the case study and forms the ultimate guiding principle for this busy teacher-researcher. The simple prioritisation of students’ needs helps me stay focused and grounded. This actualises though questions such as ‘how does this benefit students?’ or ‘is this the most important thing these students need right now?’ In this case, the continuous reflection of their teachers leads to a continuous strive for betterment in the means through which we facilitate their learning. It is this overarching process which ensures the evolution of teaching practices, and these must continuously evolve to keep up with the evolution of the social world and thus the needs of and demands on the young people we teach.

(ii) An honest account, this work is almost intended to reflect some of the intimate knowledge I have access to as an ‘insider researcher’. Contrary to this nefarious-sounding phrase, the intention is not a mere act of reportage, it is to acknowledge the truths which often go unsaid, in an attempt to contribute to a more comprehensive understanding of the overall picture. The researcher is always a curator of the truth: we decide what to include and exclude from our work, based on what we deem useful. In my case, I often thought it useful to share the difficulties my colleagues and I have faced, for these do not often have a legitimate outlet.

(iii) Demographics aside, there is much that the general population of students share and by a similar extension, there is much that the Academy shares with other non-private non-selective
schools across the country. Simply calling the students ‘disadvantaged’ erases the complexity of the situations they face and simply saying the school does not do enough to support them ignores the pressures we must navigate to do so. It is therefore of utmost importance that the reader who does not spend every day in a school like the Academy be reminded to reserve their judgement and keep an open mind, even acknowledging their partial ignorance of this context. More poignantly, I am often struck by the lack of diverse representation in academic research and academic circles. The settings represented in educational research are often more middle-class and predominantly white, therefore it is important to include the perspective of teachers in schools with more socio-economic and racial diversity.

(iv) This research is practically focused but validated by theory: my theorisation of lesson study is intent on solution-design but without erasing the contextual elements. The first two principles already prioritise the practical aspects of the research but if this were enough, then there would be no need for doctoral research at all. There is a wealth of knowledge in sociological research, which goes completely untapped with regards to its application to educational contexts. It has been a precious opportunity to be given access to this repository, in dialogue with the people who actively construct it. After having dived into the academic complexities, my responsibility is to propagate this knowledge, not just in terms of dissemination of my research, but in continuous engagement with the teaching communities I am part of. The professional doctorate is but the seed which is planted to bridge the divide between university academics and practitioners; it is the continuous responsibility of both parties to nurture bonds between the two communities which extend beyond the lifespan of their projects, in our mutual construction of better educational systems.
2. Context

This professional doctorate is grounded in its context, which both informs the rationale for the research and directs its purpose towards an improvement in some of the conditions and situations described.

The first lesson study I participated in had a profound impact on my identity as an educationalist as well as a ripple effect on my approach as a teacher and a school leader. I was quick to latch on to the process as a more ‘scientific’ means of developing both my knowledge and my practice. However, the micropolitics of the lesson study planning team soon left me questioning the rigid structure I had been introduced to. Despite many practical difficulties, I continued to experience the benefits of lesson study first hand and ultimately decided to use its more positive and empowering properties to circumvent my contextual constraints.

This chapter provides an insight into my introductory experiences with lesson study, exploring some of the challenges of implementation, in relation to the structures, cultures and individuals lesson study interacts with. Providing some background on the current research setting, key contextual requirements are also underlined to establish the foundational objectives of the research.

2.1. Personal Experiences of Lesson Study

I first took part in a series of lesson study as a mathematics teacher at a Midlands Secondary School\(^1\) over a period of three academic years from 2013 to 2016 (see Appendix A.1 for summaries of each lesson study cycle). To understand why I want to, or even need to do this research, it is essential for the reader to get a glimpse into this experience, as a key constituent of my formative years as a researcher of lesson study. My personal history of lesson study not only informs the rationale but also elucidates an honest picture of one of the social spaces I inhabit as a professional doctoral researcher, key to my identity and the overall aims of my research.

\(^1\) School names are anonymised
Crucially, the first-hand experience of the social complexities and issues surrounding participation in lesson study forms the roots of the problems explored in this thesis. The five distinct lesson study cycles presented here demonstrate both the strengths and weaknesses of the traditional lesson study model, against the backdrop of organisational pressure and the micro-politics of lesson study planning teams.

**Year 9 Problem-Solving Lesson Study (LS1, October 2013)**

My first lesson study involved the use of investigative problem-solving resources designed by a group of academics (the Bowland Maths team) at Nottingham University, at a time of great change to secondary school teaching in England. The lesson study was centred on improving the problem-solving skills of students, to improve their access to the dreaded ‘new 9-1 GCSE exams’, due to be first examined in 2017. A newly reformed curriculum introduced new content as well as a higher proportion of non-standard mathematical questions to the GCSE exams (taken by 16-year-old students at the end of their broader formal schooling, before turning to more specialised compulsory study) involving more analytical and evaluative skills, in an attempt to render the qualification more academically rigorous, thereby increasing the UK’s position in standardised international tests. A new grading system introduced an ‘aspirational Grade 9’ scrapping the 8-point letter grades in favour of a 9-point number grading scale. Finally, to further ramp up the pressure on non-fee-paying schools to perform, league tables² which previously ranked schools according to the percentage of students achieving five Grades C to A* (including English and Maths), were now also quantifying both the attainment and the progress of students in terms of eight ‘academic’ subjects with both English and Mathematics double weighted. The ‘Attainment 8’ and ‘Progress 8’ metrics would complement the existing Ofsted³ inspections to put local

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² Officially known as the School Performance Tables, these rank schools based on exam performance. The secondary tables measure performance across “8 key subjects”, with Maths and English double weighted and an emphasis on the sciences, computer science, geography, history, and modern languages, which are considered ‘traditionally academic’, to the detriment of the arts and ‘modern’ subjects like business and technology.

³ The Office for Standards in Education, Children’s Services and Skills is a non-ministerial department of the British government whose inspections of schools quantify their ‘success’ according to their Education Inspection Framework, most recently updated in May 2019 to explicitly include a judgement on school curricula. Schools judged to be “inadequate” are closely
schools in competition with each other. A school’s standing not only affected its local reputation but also influenced the number of admissions it would get the following academic year, thereby determining the school’s budget. In such a competitive and performance-focused environment, this lesson study was a means to step back and reflect on our teaching approaches in light of new academic challenges without losing track of the overall objective of the school to perform well in the GCSE exams (particularly in English and Maths).

The study involved me, another Maths Teacher (MT0), the Head of Department (HOD) and the Second in Department (SID). Both the HOD and the SID had already taken part in a series of lesson studies and even visited Japan the previous academic year to observe lesson study in action. Their influence and control over the lesson study were absolute, with the SID particularly invested as they were developing leadership expertise in lesson study. An external academic acted as kushi, or ‘knowledgeable other’ and took part in some meetings as well as providing feedback on the lesson during the planning stage. MT0 and I were similarly highly motivated junior teachers with strong subject knowledge (arguably ‘stronger’ subject knowledge relative to the HOD and the SID), therefore our contributions to the overall lesson study design were significant and mostly guided by pedagogic and intellectual curiosity. The individual motivations of the participants created a highly charged group dynamic leading us to invest around 25 hours in the design of 2-3 lessons, one of which was observed by around fifteen teachers and academics (including visiting academics from Japan) and deemed a highly successful public lesson.

In terms of the learning observed, Year 9 students were able to draw upon a framework or ‘checklist’ to verify the logic of their arguments to an open mathematical problem with no apparent clear strategy for finding a solution (see Appendix A.2 for the lesson study plan and resources). This gave students the confidence to evaluate the validity of their solutions (because there was no ‘correct answer’) and to communicate them effectively through pictorial or

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monitored by Ofsted and non-academies can be forced to become academies by being made to join a trust.

4 All teachers will be referred to by gender-less and ethnicity-less job titles and pronouns
diagrammatic representations. Personally, I was able to witness very powerful learning moments of children, or what others have referred to as “critical incidents” of learning (Fang et al., 2011) and this had a profound effect on my perspective as a teacher. Indeed, I felt empowered: I had taken the first concrete step towards the previously fuzzy curricular demand of ‘teaching more problem-solving’ by exploring the definition, challenges, and importance of this skill. I explored this lesson study in detail in my Masters’ dissertation titled ‘Lesson Study: the collaborative research-based professional development cycle in pursuit of a better mathematics educational system’. This analysed the macro and micro benefits of engaging with lesson study, respectively from a national curriculum and a teacher professional development perspective, to conclude that more large-scale longitudinal research was necessary to evaluate the short and long-term effects of lesson study more decisively. I had intuited that there was a temporally defined ‘dissolving’ aspect to the effects of lesson study and that multiple social factors (such as the intentions or agendas of participants) also affected its overall effectiveness.

**Year 9 Maths-Geography Joint Lesson Study (LS2, March 2015)**

A second cross-departmental lesson study was conducted in March 2015 in collaboration with the geography department to help students link mathematical and geographical knowledge when interpreting statistical graphs. This lesson study involved the HOD, the SID, me and two geography teachers. Students had to apply statistical instruments to geographical concepts to inform rich contextual mathematical analyses, to ultimately illuminate the two subjects’ interdependence. Scatter graphs were used to analyse correlations between geographical factors, but this lacked the depth of the first study and was intended more as an entrée for the geography department into lesson study. This experience stood in contrast to my initial one: the purpose was not pursued with the same vigour and the outcomes were not analysed, discussed, or acted upon in either department, thereby losing some of the beneficial elements I had experienced in LS1. This was a random, stand-alone, and shallow instance of lesson study, with no apparent wider outcomes other than the actual resources produced for the lesson itself.
Year 7 Algebra Learning Study (LS3, October 2015)

LS3 was conducted as part of a series funded through the local Maths Hub (a local school given additional funding to aid the development of teachers within the locality), with the intention of inviting local schools to observe a public lesson at the end of each of the four lesson studies, scheduled for October, December, March, and June of the 2015-2016 academic year. We also created a website, where we intended on sharing the outcomes of each lesson study. It can be analysed here as an interesting model of ‘lesson study gone right’ as well as ‘lesson study gone wrong’.

The main lesson was taught by me with the SID, the HOD and two other Mathematics Teachers (MT1 and MT2). We were self-tasked with bridging the gap and rectifying misconceptions when introducing students to algebra in Key Stage 3 (the preparatory first two/three years of secondary school, prior to officially embarking upon the GCSE syllabus). After intense discussions and consultations with the department, an elegantly succinct research focus was identified as central to students’ deep understanding of algebra (itself the key to accessing secondary-school-level mathematics): the idea of the variable as a pro-numeral entity, which enables the generalisation of numbers. Students were made to demonstrate the limitations of their generalisations and to seriously consider the use of the symbols they used to represent numbers. This lesson study was without a doubt, the most in-depth and informed reflection I have ever conducted on my own teaching, and thereafter led to a transformation in the way I understood and conveyed the importance of algebra to my own students. Again, the depth of the lesson study was predicated on the deep subject knowledge contributed by me and MT1. The full rationale and a summary of the lesson plan, as well as a few examples of students’ work are in Appendix A.2. In short:

*We propose three lessons (the second of which will constitute the main Public Research Lesson) during which we begin with a simple $10 \times 10$ grid superimposed with dominoes, as a source of patterns. Following students’ familiarisation with patterns within an $n \times n$ grid of consecutive numbers, we introduce the idea of a variable as something which can be*
mapped to anything on the grid, and from which we require expressions to be formed. By the end of both lessons, we expect some students to have generalised with two variables, \( n \) (the dimension of the grid) and \( x \) (any number on the grid). This will be achieved through a series of “same but different” tasks – each one being a subtly more evolved version of its predecessor to gently introduce this Year 7 class to algebraic principles, without explicit mention of algebraic procedures and focusing instead entirely on the underlying concepts behind the algebra.

The research questions were: (1) “How can we make the concept of a variable as a pro-numeral entity, explicit to students?” And (2) “How can we support students in making algebraic generalisations based on observable numerical patterns?” These were both perceived as key concepts underpinning students’ foundational knowledge of algebra. Both the research purpose statement and the research questions demonstrated deep mathematical knowledge (both students’ and teachers’) following intensive free-form thinking discussions. MT1 and I were able to bounce ideas off each other, as ‘equally subject-knowledgeable’ individuals, and we indeed replicated this success with the smaller LS4. LS3 is referred to as a lesson study but it is also a clear example of a learning study\(^5\), whereby the main ‘object of learning’ can be clearly identified here as the “variable as a pro-numeral entity” and the use of Variation Theory is evident in the “same but different tasks”.

It was whilst taking part in this lesson study that I first noticed the potential wider problems with lesson study implementation. Working in a high-stakes environment (secondary school in socio-economically deprived neighbourhood, with intense pressure on teachers to achieve high grades in exams), we were used to the daily stresses of teaching. However, the group dynamics were getting frayed due to personal politics, leading me to consider the effects of micro-politics on the outcomes of a lesson study. Not only was lesson study a time-consuming endeavour, but it could also be energy-sapping as well, if the lesson study group was not open and democratic.

\(^5\) Defined in more detail in Section 3.1. History and Current Forms (of lesson study)
Lesson study then effectively turned into a power-play for the purpose of fulfilling one individual’s personal agenda, contrary to the wider educational goal it should serve. This is a danger anywhere lesson study is introduced, for it is often introduced and ‘spearheaded’ by a particular individual, who will be invested to varying degrees, in the project’s success. This places a unique pressure on that individual (who is likely to be a person with relative power over others in the department or group), whose promotion of the positive effects of lesson study will also likely silence any negative feedback, thereby damaging the possibility of long-term success for lesson study in that school.

Students in LS3 were also briefed by me, as well as the HOD to ‘perform well’ during these lessons. Firstly, we tragically removed students whom we thought would struggle with the concepts being taught, those who would not be able to articulate their thoughts in front of an audience or who would simply be ‘naughty’. They were replaced by students whom the HOD perceived to be ‘better students’ from their own class. Therefore, the dynamics of this class were rather artificially constructed for the purpose of creating the best public research lesson possible.

I gradually became uninvolved in this series of Maths Hub Lesson Studies, which hindered my initial plans of including the full series of lesson study in this thesis but did open an interesting new opportunity to work in pairs with like-minded colleagues on more in-depth lesson studies.

**Year 9 Secret Lesson Study (LS4, November 2015)**

Following fractured relationships within the mathematics department, lesson study was conducted as two distinct and separate projects: the initial lesson study project (which began with LS3) continued with the HOD, the SID, MT1 and MT2 and I began conducting more experimental ‘unofficial’ lesson study with MT1 and MT3 (who joined the school in September 2015). Upon interviewing them, it seemed that MT1 and MT2 were more open to the general idea of lesson study and MT1 was keen about working collaboratively. So, during the same lesson study cycle from which I was now barred, myself and MT1 planned another activity together which we delivered to our respective Year 9 classes and which they jokingly referred to as a
“secret lesson study” (LS4). It was so called because we were particularly withholding the lesson study from the HOD and the SID, for fear of further aggravating the tense working relationships. Although this lesson study was almost carried out in jest, the sentiment of collaborative work and the framework for lesson study was utilised, with the exception of joint lesson observations. The aim of this lesson study was to allow students to apply their geometric knowledge to complex open questions. Unlike LS3, this was done through the delivery of a resource, making it an example of ‘kyozai kenkyuu lesson study’\textsuperscript{5}. Unlike LS2, this did result in observable long-term change outside of the lessons in that we discussed the findings with other colleagues, shared the resources and personally adapted the ways in which we taught the topic of surds to students of various ages.

Year 12 Graphs Learning Study (LS5, April 2016)

As part of another enthusiastic member of the department, MT3’s, Master’s assignment, I conducted another ‘secret’ learning study. We collaboratively planned and delivered a Year 12 Revision Day (half a day spent re-covering key concepts and skills in preparation for an exam) in April 2016, which was observed by MT1 and MT2. We adhered to the stricter definitions of lesson study more rigorously, in that there were more than two people involved and an official lesson observation took place, alongside post-lesson discussions and write-ups. Following a ‘rehearsal lesson’\textsuperscript{5} with my Year 12 class, an amended finalised version of our planned lesson was delivered to MT3’s Year 12 class, based on our joint understanding of the students’ profiles and misconceptions to get them ready for their rapidly approaching Advanced Subsidiary (AS) exams in May. The full lesson study report can be found in Appendix A.3, where the research question, “How can we inter-connect the algebraic concepts fundamental to the graphical representations of functions?” was tackled in three parts: (1) working between equations, sketching and transformations including the use of f(x) notation, (2) a taxonomy of graphs (and transformations) and (3) the visual links between the graphs of $y = f(x)$, $y = f'(x)$ and $y = f''(x)$. Part 1 was explored in the research lesson and the outcomes were successful:
This Lesson Study transformed the way the teachers involved teach algebra. The importance of graphs in the teaching of algebra and trigonometry and how deeply the concept of graphs as functions, permeates mathematics, (all the way back from "y=mx+c" in Key Stage 3) became increasingly apparent as teaching in AS level progressed. All teachers, including observers, began changing their delivery based on the outcome of the Lesson Study process.

For example, [MT3] taught [their] Year 11 Target Set (aiming for Cs in the GCSE) to sketch quadratics when solving and/or factorising them in order to develop a visual understanding of the quadratic function as a parabola. MT3 also taught Year 7 Set 3 to find the intercepts of straight line graphs to visualise a sketch of the line prior to plotting. [I] taught 9 Set 1 to sketch non-linear graphs through transformations of the most basic form of quadratics, cubics, reciprocals and exponentials.

By the end of the academic year, during collaborative revision classes, students were clearly more confident and competent at handling Core 1 and Core 2 GCE exam questions involving the sketching and transformation of graphs. They were also making use of sketches to support their thinking when solving coordinate geometry questions. The original intended outcomes of this Lesson Study were achieved, perhaps not in the format originally intended and certainly not in the same way by [the two different Year 12 classes], but nonetheless, the process was conceptually deep and allowed students to form highly developed interconnections amongst mathematical ideas.

Each of the lesson studies exemplified in this chapter was unique in its form and execution, with varying degrees of success based on how ‘success’ is defined. To an external observer, the outcomes might have seemed more powerful than they were and indeed, in public post-lesson discussions, participating teachers were incentivised to enhance the positives or ‘learning points’ of the lesson as opposed to the seemingly more negative issues described here.

For example, the Year 7 students’ reaction to LS3 was slightly fabricated as not only were they already familiar with algebra, but we also artificially created the class by putting together a
group of ‘favourable’ students. This ran somewhat contrary to the ultimate purpose of a lesson study: to be of educational value to teachers (and students). Many of these students found the nature of the questioning “stupid” and “pointless” because they already knew that a variable could be mapped to any number. However, we purposefully did not acknowledge this as it was disruptive to the overall agenda of ‘showing off’. Whilst we tried to demonstrate the students’ learning journey (see examples of students’ work on Page 287) to an audience, the actual benefits to this set of students are debatable. Perhaps the lesson would have been more appropriate for primary school students completely new to algebra, or a pre-assessment of the students’ algebraic understanding should have been carried out initially. Regardless, a large proportion of what we did can be deemed as an act of showing off our subject knowledge as well as our proficiency in conducting lesson study.

As an insider, I was able to witness the internal mishandling of multiple lesson studies, which outsiders, including visiting academics, most likely failed to notice as the department held up appearances. The hierarchical team structure of this department was the demise of these lesson studies; clear roles, responsibilities and norms should have been established and adhered to. Choosing a lead teacher from the start meant that the onus was increasingly placed on that one teacher to come up with solutions and therefore there was very little collaboration outside of official discussions and no actual shared accountability.

Although the intended outcomes were said to have been met in most of the studies, it is unclear how much students valued or internalised the concepts we had intended for them. No attempt was made to record this or to refer back to the lessons. There should have been a better follow-up procedure, perhaps through a post-lesson report, as demonstrated in LS5 (Page 289). A tremendous amount of effort went into the planning stage of each lesson study and a re-teach might have been useful - with a particular emphasis on the key learning points for students, as perceived by them and not as dictated by the teachers.
In the final Year 12 lesson study, the learning outcome was said to not have been achieved during the research lesson itself but the tasks and ideas were slowly delivered through a series of follow-up lessons instead. Whilst a report was written for this lesson study, the process was still somewhat left hanging at the end and that is potentially where we might be missing out on more explicit long-term benefits. Ironically, LS3 was viewed as flawed by me but ‘successful’ by external visitors whereas LS5 was deemed a ‘failed’ lesson study, but resulted in fantastic follow-up learning experiences for both students and teachers. This subjective notion of ‘successful’ lesson study therefore requires more contextualised success criteria, spanning beyond the immediate lesson study outcomes.

2.2. The Academy

Moving to another school in 2016 enabled me to start afresh with lesson study and provided me the setting for the empirical research of this thesis to take place. The Academy\(^1\) is located in Outer London, straddling an ‘inner-city’ demographic but without the inner-city funding. Previously reputed to be a ‘rough’ school, it was converted into an academy in 2011 as part of the government’s efforts to improve educational standards in secondary schools across England, particularly in London. After a failed partnership with a local high-performing Catholic school, the Academy became part of another small Multi-Academy Trust (or MAT) in 2018. This trust consists of another much larger local secondary school (with a relatively less socio-economically deprived semi-selective student body) as well as several local primary schools. The strengths of the Academy include the strong relationships between staff and students, incremental pastoral support network, strong parental links, motivated energetic young staff body and pro-active Middle and Senior Leadership Teams. Whilst the specifics of this school are unique, the climate of high pressure due to staffing issues, ‘difficult’ students (arguably students lacking the support or stability they require, at home, at school, or both) and curricular changes detailed below will be applicable to many secondary schools throughout England.

As the reputation of the Academy has been gradually improving over the last decade, we have been drawing more students from the suburban parts of Outer London and fewer disadvantaged
‘inner-city’ ones. However, as of the 2019-2020 academic year, 45% of our students were still from the 20% most deprived areas, according to the 2019 English Index of Deprivation. 13% of students were considered to have a Special Educational Need (roughly in line with the 12% average in state secondaries), 36% had English as an Additional Language (more than double the national average of 17%) and were born outside of the UK. 50% of the current school population had been in receipt of Free School Meals at some point during their secondary career with 35% currently entitled to the Pupil Premium (compared to the 15.9% national secondary school average), indicating low household financial security. Very few students (1%) were in care, but about 5% were considered ‘vulnerable’ in terms of their home lives. 75% of students were ethnic minorities (compared with 32% nationally) with a majority of 46% of students identifying as Black (Black African, Black Caribbean or Black Other, but not Mixed Race). Whilst our diverse student body is not reducible to these statistics, some of these demographics come with considerable challenges. Importantly, there are far more interesting statistics which are not officially calculated such as the number of students who move in and out of the school and the number of unofficial school exclusions each year, both of which I suspect would be most concerning, based on my teaching experience at the Academy.

Another, more pertinent new challenge for the teachers already struggling to come to terms with the Academy’s contexts, was that of the ‘new curriculum’ already touched on at the start of this chapter. Further to the aforementioned ‘new Maths GCSE’ of 2017, the ‘new Maths A-Level’ was also launched in 2018, extending the challenging curriculum from five to all seven years of secondary school. As teacher numbers dwindled and individual workloads increased, teachers at the Academy found themselves in a similar situation to students in that those who required the most support in terms of professional development were not able to receive it, trapping the

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6 Based on income, employment, education, health, crime, barriers to housing and services and living environment.
7 All national averages as per the United Kingdom Statistics Authority (2020), including the exclusions figures (2020) but excluding the SEN averages produced by the Department for Education (2019)
Academy in a vicious cycle of high staff turnover, further aggravating the myriad of issues we were already struggling to take control of.

To complement my own perspective, that of two other members of staff was sought, to further objectively inform the context, separately to the official data corpus: the member of the Senior Leadership Team (SLT) managerially responsible for the maths department (my direct line manager) and the Principal (that same member of SLT’s direct line manager). The Principal had been at the Academy for nine years (as of 2019) and was part of its academisation process, with the intention of helping improve the life chances of the students attending the school. From their strategic perspective as head of the organisation, the grades came first (due to the government funding formula linking pupil numbers to funding and the competition for student admission preference described on Page 23), then “the niceties after”. Their ideal of professional development was that it would involve more mentoring/support for teachers of all experience levels as well as having dedicated budgets and time allocations. Within the restrictions they operate under, they felt the school was doing enough of the right things to be considered “moderately successful” in terms of the current professional development provision, considering the broader issues of recruitment and retention (which were the worst they had experienced in their 22 years of teaching).

Further to the demographics of the students and teachers, the Academy is full of “systems” (procedures and protocols). There are administrative means of tracking virtually every aspect of the school as well as a variety of different sanctions (which are inconsistently applied and ever-changing). The SLT member interviewed expressed their astonishment at this wealth of systems as well as pointing out that teachers at the Academy work up to (and sometimes beyond) the legal requirement of appointed hours. Therefore, given free rein over the school’s official professional development programme (which they rated very poorly), they would simply give time back to the teachers to do their planning and preparation. As they put it, “we are doing too much firefighting, we don’t have time to think strategically”.

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My role within the Academy started as a Maths Teacher in June 2016 and gradually involved more official (and unofficial) responsibilities. I was made Maths Coordinator in 2017 and have been Team Leader of the Faculty of Mathematics, Business, and IT since September 2018. Recruited through the Teach First network, I was specifically looking for an improving school in the part of London I was relocating to: I wanted to be able to apply my knowledge and five years of teaching experience to developing strategies in a challenging leadership position. A school with a high proportion of Free School Meals recipients was also a desirable trait for me as these were the types of students whose improving life chances I wanted to contribute to. The management of student behaviour under the Academy’s complex structures was a challenge for me, and for most of the experienced teachers who join the Academy, just as it is for the inexperienced teachers.

This rather inefficient lag or adjustment period is largely due to the lack of support for new members of staff, which is particularly needed to get to grips with the large number of day-to-day procedures and protocols.

My initial struggle to truly get to understand these systems and more importantly, to develop the tacit knowledge of the students, leadership staff idiosyncrasies and (implicit and explicit) organisational structures, to then apply them effectively, has also greatly influenced my idea of successful professional development at the Academy. My strategy has and continues to be to create and adapt my faculty’s systems and structures around the Academy’s, particular with regards to its short to medium-term requirements. By introducing lesson study, I am hoping to also start developing some more long-term systems for improvement.

With the Maths department’s increasingly improving results and decreasing performance issues, we are given a fair amount of autonomy over how we operate: as long as it works, nobody cares to ask too many questions (similar to the Academy’s relationship with Ofsted). For the last few years, my main priorities have been: to improve the Year 11 and Year 13 results by creating effective assessment-analysis-intervention strategies and programmes and to improve the quality of teaching through continuous recruitment (we are essentially always recruiting as this is the only way to counter the consistent turnover), monitoring performance and professional development.
(with a lot of one-to-one mentoring of our continuous incoming stream of trainees and inexperienced teachers, as well as through lesson study). One of the greatest challenges I have faced as the Head of Maths is the lack of experienced specialist Maths teachers. The school, in particular the Maths and Science departments are routinely under-staffed and as a result, teachers teach multiple subjects outside of their specialism (for example a French or Physical Education teacher might teach Maths to students in the lower years) and often, a student who has been in the Academy for 5 years might very well have experienced over a dozen ‘Maths teachers’, about half of whom might have been cover (temporary replacement) or non-specialist teachers.

A good snapshot of my challenging workload during key points of this research was captured by the diary entries appended. The desultory tone of Appendix B.1 is one many new teachers will empathise with: the first few years of teaching in schools like the Academy (and even Midlands Secondary School from Section 2.1) are extremely demanding and result in very high turnover rates (1 in 3 teachers leave the profession altogether within 5 years of training (The Department for Education, 2021)). This is demoralising for the trainee teachers who enter the profession full of hope and enthusiasm, for their mentors and other experienced teachers who spend their time training them, not to mention for the students who experience teachers constantly abandoning them. Unable to replace teachers at the same rate we lose them, professional development becomes more than just an ‘add-on’ to enhance the skills of current teachers but a necessary support system for those who are clinging on as they struggle to come to terms with the new and complex systems they find themselves operating in. Re-conceptualising professional development is therefore not just an intellectual exercise, but one borne out of desperate necessity. Moreover, the introduction of lesson study into the department could absolutely not constitute a further drain on teachers’ precious time and energy, it had to be meaningful, purpose-driven and highly efficient.

**Hectic environments**

The social dynamics of the ‘hectic school’ described above, are loaded with historical, political, and economic complexity. Yet, discussions of time and energy management in schools
are either ignored or neglected, as part of the pervasive capitalistic view that teachers are expendable commodities expected to deliver value for money, to be productive and whose responsibilities can be infinitely expanded. Since my work aims to highlight these under-emphasised contextual complexities, this section delves into a socio-political conceptualisation of schools as a working environment, further theorising the issues explored this chapter, as part of my broader efforts towards a professional development solution which acknowledges these complexities and responds to these demands.

Appendix B.3 describes some of the “temporal demands” (Wajcman, 2015, p. 3) of a teacher. The official core responsibilities of the job can make the school environment feel hectic and leave individuals energy-sapped and demotivated. This is extremely detrimental to their participation in professional activities like lesson study, which must be deprioritised in favour of more urgent tasks. If “temporality is an invisible and unremarked relation of power” (Sharma, 2016, p. 137), then how do teachers disrupt these powers to gain back control of their time?

Wajcman (2015) defines the modern workplace as “harried” with its “information overload, endless interruptions, multitasking, and raised expectations of speedy response time” (p.7). However there are some elements of the school context which take it beyond the realm of “harriedness” and which I hereby define as ‘hecticness’. ‘Hecticness’ involves higher levels of time rigidity as well as an element of ‘emotional blackmail’ in the face of moral duty towards students.

The school day (as described in Appendix B.3) is very rigid. With a minimum of 72% of working hours at the Academy officially directed (even outside of an official teaching timetable of a maximum of 22.5 hours, a teacher faces a minimum of 4.5 hours of student supervision and meetings weekly), this means that teachers have very little “temporal sovereignty” (Wajcman, 2015, p. 11). Other dimensions of ‘harriedness’ are also evident in schools. The “density of time” might be experienced by a teacher as the volume of tasks they have at hand, which they must complete within the rigid time structures they operate under. These tasks might prioritised as:
• essential (‘pre-lesson prep’, ‘in-lesson reactions’, ‘post-lesson tasks’ (marking, issuing rewards/sanctions)),

• compulsory (supervision of students (duties), attendance of meetings/events, reading of emails, other compulsory additional tasks),

• and other non-compulsory additional tasks (e.g., professional development activities).

The latter also comprises of all manners of requests, guidance, advice, rules, and regulations, which teachers pick and choose from, depending on what they deem important. Often, a teacher will only choose to participate in formal professional development activities as a prerequisite for career advancement.

“Temporal disorganisation” is also faced through a multitude of unanticipated tasks from both colleagues (e.g. a senior leader needs to complete a report on X, therefore every team leader needs to write a paragraph on Y and submit this in the next 48 hours) and students (a simple trip to the toilet during the 20-minute break might be interrupted by a student in distress, or a scuffle in the corridor). This not only eats into our 28% unstructured time but also leaves us feeling unprepared for upcoming classes, it increases our stress levels and reduces our ability to deal with difficult situations requiring mental fortitude. Whereas some professionals’ work is ‘high value, low volume’, the tasks we perform outside of the classroom can be characterised as ‘high volume, low value’. The very act of pausing to relax would make a huge difference to our emotive states, thereby affecting our ability to reflect on and adapt our practice.

As well as high in volume, the complexity of some teaching tasks can also be daunting. Technology has enabled teachers to outsource the time we used to spend reading textbooks and hand-writing questions on a chalkboard so that we can refer to our website of choice and at a click of a button, download and present a lesson on any topic. The ease of access to an abundance of resources and the availability of this technology across every classroom in England has revolutionised our approach to lesson delivery. Whereas there are Japanese studies dedicated to the layout of the chalkboard, many teachers in England ‘click’ onto their lessons without much pre-planning. Similarly, most teachers will not be flicking through entire exercise books or
marking in the traditional sense. A more modern approach involves the use of online self-marking quizzes and short, printed assessments which diagnose specific issues. Behaviour and safeguarding issues are catalogued on digital systems which enable us to create trigger points for interventionist actions at varying levels.

These ‘time-saving measures’ however, have simply redirected our time towards other, arguably more difficult, tasks, which professional development and teacher training approaches completely fail to address. Whereas previously, the ‘slower’ acts of planning a lesson, writing out questions and marking books might have constituted the main components of a mathematics teacher’s activities, these aspects have become integrated into the more complex tasks of curriculum design, resource management and personalisation, ‘assessment for learning’ and the targeted provision of support and intervention. Yet, when we train teachers in England, there is no ‘teaching 101’ course which actually explains what a curriculum is, let alone how to go about designing or adapting one. Instead, the focus on arbitrary pedagogic theories and endless discussions of ideals, leaves teachers unprepared for the complex demands they face in their schools. When teacher performance is then assessed based on these abstract criteria, it is no wonder that even some experienced teachers cannot articulate, let alone demonstrate, the pedagogically dense and ever-changing ‘standards of excellent teaching’ (The Department for Education, 2011). The current approach to the integration of these government-endorsed pedagogies into teacher practice involves short presentations followed by calls for evidence of implementation. This therefore presents an opportunity for genuine professional development activities: to enable teachers to engage with big educational ideals. Indeed, as we often lose track of our priorities against the tide of policy and exam-driven demands, professional development approaches can re-democratise these choices and empower teachers to re-formulate educational goals, in order to more effectively “coordinate our social practices” (Wajcman, 2015, p. 65).

To complete a large volume of complex tasks, teachers must “recalibrate to the time of others as a significant condition of their labor. As a result, specific temporal regimes and strategic dispositions are cultivated in order simply to survive within the normalizing temporal ordering of
everyday life” (Sharma, 2016, p. 133). Thus, the classroom teacher develops their routines around their constraints and affordances, and not necessarily based on what they deem necessary or crucial. Indeed, if one conceptualises time as a cultural collective, whereby teachers “exist together on a grid of temporal power relations”, it might be that questions of beliefs and identify are completely de-prioritised from these decisions, due to the “interdependent and relational nature of time” (Sharma, 2016, p. 133). The autonomy or agency of the classroom teacher is lessened, in that as a result of their relative lack of power in schools, they are the ones forced to “recalibrate”. Emancipatory professional development approaches must therefore address these power imbalances, in favour of the teacher.

Entirely teacher-led methods such as lesson study not only restore the teacher’s autonomy but also their time sovereignty, if properly embedded into school structures. If teachers’ time and energy during their working hours are implicitly and explicitly controlled by macro and micro-political structures, could lesson study, which occurs at a ‘meso-level’ (group level), disrupt these structures to afford teachers the time and space they require to be “contemplative and deliberative” (Sharma, 2016, p. 137) or is it perceived as another inescapable drain? A loaded assumption of processes like lesson study is that ‘slowing down’ necessarily changes or improves “the ways in which individuals and social groups are tangled together in time” (Sharma, 2016, p. 138). Afterall, it is easy for lesson study to have the opposite effect, as detailed in the negative micropolitics of lesson study planning teams in Section 2.1.

Whilst the culture of ‘lack of time’ or overwork can be categorised as a neoliberal by-product, it is necessary to peel back the social structural layers to understand how and why this has shaped the professional development landscape. Rapid policy changes required rapid responses which resource-scarce schools deliver in chunks during professional development sessions, and through new structures and policies which eventually shape new cultures and sub-cultures within schools. ‘Time and space’ are thus, not simply a limiting factor to professional development but a complex sociological concept which permeates and necessarily hardens aspects of teacher practice, making them impervious to change and presenting a seemingly insurmountable challenge to this research.
Teaching Trios (2016-2018)

The Academy had been running a programme called Teaching Trios (loosely similar to lesson study) since before I joined in July 2016 and with my academic background on lesson study, I was given some ownership over this (but with unfortunately strict guidelines and restrictive oversight) over the two academic years spanning from 2016 to 2018. I had therefore delivered whole-school training on lesson study but this has only been implemented as part of an existing ineffective strategy of cross-departmental Teaching Trios in the first year, to be mildly improved in the second year, whereby I was able to convince the involved Senior Leader to run Trios within departments. I would have continued with this if the Academy had not withdrawn the programme, as a different Senior Leader took ownership of the programme. There was some scepticism amongst most of the staff regarding lesson study’s long-term benefits and possibly a considerable amount of negative experience of the concept. Whilst lesson study might be key to the development of teachers, other professional development opportunities might also be equally required to serve the needs of the teachers in this organisation.

2.3. Key Contextual Requirements

From the moment I began to pen my registration viva, and therein constructing my thesis, I understood that the actions I would take in the name of research would have to be grounded in the context of my setting. I would not simply gloss over the ‘difficult urban environment’ in the evaluation section; mine would be both pragmatic and ambitious, working with and not fighting against, the Academy and the wider educational contexts it operates in.

In analysing each problematic facet of the reality of my (rapidly evolving) situation and creating real grounded solutions, my research stance naturally took the form of action research. The reflections, observations, and conversations in this chapter effectively became the 2D blueprint to the 3D model I constructed in my methodology and am presenting in this body of work, with the following summarised ‘realities’ forming key requirements for the implementation of lesson study at the Academy.
1. The demands of the wider educational system must be met first and foremost

The issue of workload and its relation to recruitment and retention have already been detailed in this chapter, therefore it would be foolish to introduce into the Academy lesson study which takes up dozens of hours of teachers’ free time (like LS1 from Page 23). Conversely, is there any point to running a ‘shallow’ lesson study or one in which participating teachers are not fully invested? There is a fine balance to be achieved with regards to spending the right amount of time on a lesson study cycle.

The Academy operates within constraints imposed by the government, and within this, teachers operate within the constraints imposed on them by the Academy. Thus, the chain of liability has us all tied together towards the goals dictated from the top, themselves a heavily politicised and civic matter. Therefore, there is a need to negotiate agendas and spaces, to ensure that lesson study remains a free and democratic process and in which all participants engage willingly. Forcing lesson study onto others simply because I feel that ‘it is the best form of professional development’ runs counter to this and it would be better to slowly introduce it, linking it to existing systems organically.

2. The existing teacher knowledge pool (and urgency of professional development needs) affect the quality of the lesson study

In a team with a range of existing knowledges of the subject, curriculum, pedagogy and contexts, lesson study would be great at drawing together these different experiences. If some lesson study participants are particularly lacking in some of these areas, then it remains for the rest of the participants to make up for this. Essentially, lesson study participants must fill their knowledge gaps amongst themselves and there is therefore the necessity for one or multiple participants to share their above-average knowledges and/or those with these knowledge gaps to be motivated enough to independently or co-dependently seek to close them. If neither the knowledge nor the willingness to learn exist, then lesson study will not be effective.

Whilst it can be the key which allows a teacher to unravel the complexities of their profession, lesson study cannot further teacher knowledge independently. Teachers enter the
profession and the Academy with imperfect teacher knowledge and whilst lesson study can help fill knowledge gaps in a collaborative manner, there are more direct ‘injections’ of knowledge which can and must be given along the way, especially considering the issue of workload. For example, a French teacher who suddenly finds they will be teaching Maths in two weeks’ time cannot embark on a lesson study to explore the pedagogic roots of mathematical instruction. They simply need resources and one-to-one support to guide them in using these resources so that they can meet their (hopefully intermediary) requirement of delivering maths lessons to their allocated groups of students. It is not at all in their interest to participate in lesson study. Similar urgent professional development needs can be found in teachers who enter the profession with responsibility for high stakes exam classes or a teacher who finds themselves unable to control, motivate or engage a particularly challenging class.

At the 2016 annual conference of the World Association of Lesson Study, the keynote speaker, Andy Hargreaves, gave an analogy about schools being “too busy rescuing drowning people” to realise that fixing the sinking boat would ensure they did not drown to begin with. This is something we (those who work in these schools) are very conscious of. As well as grappling with this dilemma, we cannot, in the meantime, allow our students (and teachers) to drown. This therefore creates a second balance which must be struck between short-term and long-term professional development investments.

3. Negative cultural practices are detrimental to lesson study

For a process like lesson study to achieve its full transformational potential, the right structures and cultures need to be in place. Lesson study can help nurture and inform such structures and cultures, but this is bound to be a long and arduous process, counter-directional to the current ‘educational tide’, which is generally resistant to processes like lesson study and focused on metric-based short-term goals.

If structures are taken to be external to the agential control of teachers, then they encompass the mire of school policies, protocols and procedures designed to guide the teachers’ actions,
under other wider nation-wide policies (such as national curricula, Ofsted criteria and teacher standards). Personal agency is of course, still exercised with regards to the degree to which some structures are allowed to permeate one’s actions. For example, I am more likely to adhere to school policies if a member of the senior leadership team is present in my lesson and less likely to conform to my own ideals of what constitutes a good lesson if I am sleep-deprived or otherwise physically overwhelmed. Far from straightforward, there are therefore uncountable factors influencing the actions of teachers and an acknowledgement of the overall situation as well as an adaptation to some specific issues, might provide the key to making lesson study more successful.

As perversive as the structures constraining teachers’ actions, are the objective cultures in existence. Mouzelis (2008, p. 203) also implicitly refers to culture through “institutional structures (sets of interrelated norms/roles) and relational, or figurational, structures (sets of interrelated actors)”. My experiences at Midlands Secondary School made it abundantly clear that a culture of collegiality is required to make lesson study effective, and lesson study’s main weakness and its main strength are therefore one and the same: being completely reliant on teamwork, lesson study is entirely at the mercy of the personalities, agendas and emotions of the people taking part. Ball’s (1987) analysis of the micro-politics of schools suggests that neglected cultural concepts such as power, goal diversity, ideological disputation, and conflict have their vast power to disrupt positive school transformation, and I intend to incorporate these aspects into my work.

In business and management literature, a clear distinction is drawn between the culture and climate of organisations. If the climate is “configurations of attitudes and perceptions by organization members that, in combination, reflect a substantial part of the context of which they are a part and within which they work” (Ashkanasy et al., 2000, p. 8), then the culture is the shared systems of meanings and values associated by a group of individuals in a given context. The climate is the objective reality, regardless of the culture a leadership team espouses. For example, “one cannot create a climate of participation and empowerment if the underlying assumptions in the culture are that subordinates should do what they are told and should expect
their bosses to know what they are doing”. These concepts are important because “all too often, change programs fail because they do not take into consideration the underlying culture. In other words, surveying climate and specifying a desired climate are not enough. One must analyse the underlying cultural assumptions” (Ashkanasy et al., 2000, p. 16). Within the critical realist literature introduced in Chapter 5, there is a conflation of the two terms and confusingly, an implication of ‘culture’ as the objective phenomenon (defined as ‘climate’ above).

Similarly, ‘socio-cultural interaction’ is the means by which groups draw and elaborate upon components of the cultural system in line with their interests and projects. Institutionalised structures can metamorphose through the organisation’s culture (and sub-cultures), both operating within time and space-specific socio-politico-economic contexts. Cultures therefore exist at many levels in/around a school and can be observed: student playground culture, classroom culture, organisational culture at the school-level and at the Trust-level, regional culture, national culture, global educational culture, social media educational culture (often referred to as the “edusphere”) and so on. Within these, there are dominant cultures and subcultures based not only on sub-teams but also functions and tasks (e.g., homework culture or the culture in the Maths department). An organisation like a school therefore only functions healthily with effective communication across these “cultural boundaries” and the understanding (and appropriate restructuring and challenge) of the assumptions underlying these cultures.

Of particular importance to this work is the school culture towards educational reforms. “Education policy is being reformed and re-worked on a global scale. Policies are flowing and converging to produce a singular vision of ‘best practice’ based on the methods and tenets of the ‘neo-liberal imaginary’” (S. J. Ball, 2012, p. i). Lesson study is obviously an example of such espoused ‘best practice’ and the graveyards of educational reform are littered with countless similar interventions. At the teacher-level, those who have been teaching for more than a few years doubtless experience reform-fatigue. Every year, someone (a school leader, the government, Ofsted, the edusphere, the media, etc) will want to impose whichever ‘edu-trend’ they have
discovered and depending on their influence, teachers will need to accept and grapple with this new (or sometimes old/recycled) idea.

Lesson study is a tool for redefining cultures (as well as for informing new structures), but as with the previous point about existing teacher knowledge, a favourable environment is required to a certain extent: a hostile school environment or micro-political issues within the lesson study team would be majorly restrictive. In my case, the scepticism of the Academy teachers following their participation in the Teaching Trios is likely to form the first hurdle in introducing more in-depth lesson study.

4. The agenda of ‘lesson study leads’ shape the lesson study

As detailed in LS1 and LS3, the agenda of the lesson study leader/initiator can be a guiding factor in lesson study implementation. My own agenda in initiating lesson study at my school was my necessity to produce data for my doctorate. Underpinning this seemingly selfish motive was the deep-seated belief that lesson study was a professional development activity which was worth investing time and energy in. No-one else was as invested in this venture as me, after I had spent many years and thousands of pounds studying it. This is unfortunately often the case for many programmes or strategies in schools: one vocal proponent develops an obsession with what they consider to be the ‘holy grail’ of education and everyone else has to submit to this person’s whims.

This is of course conditional upon that person’s relative status and power within the school. As the Team Leader of 15 out of 64 teachers in the school, I directly managed the teaching of nearly a quarter of the key staff body and was well-established in terms of my reputation as a teacher as well as my relationship with my team. These gave me the influence to be able to initiate lesson study within my team quite easily. The culture of the department was also quite friendly and sociable, with myself and key members often reiterating an informal motto of “we help each other out”. There was an implicit understanding that team-members had it quite good under my leadership and that other departments were far less stable and relatively less
‘hospitable’. This naturally meant that my colleagues did not in fact have a “choice” in terms of participating in the lesson study… If anyone disagreed with one of my opinions or did not wish to continue to participate in the lesson study, they may have found it difficult to broach the topic with me. I tried to circumvent this by trying to intuit such intentions, but this was far from foolproof and this aspect of the research is further explored in the ethical considerations section of ‘Chapter 6. Methodology’.

The contextual challenges exposed in this chapter are now drawn upon to evaluate the limitations of the literature, explored in the second part of this thesis, as I embark on a search the solution to these problems.
PART II.
LITERATURE REVIEW
3. Lesson Study

Chapters 3 and 4 form two parts of the literature review, exploring lesson study and professional development respectively.

This chapter begins with some background to lesson study. As a method through which teachers engage in collaborative practice-based research, lesson study embodies a pedagogic ideal. But how did/do this ideal come into effect? “Methods don’t come into being without a purpose and methods don’t come to prominence without advocates” (Carrigan, 2014, para. 2). Beginning with the origins and influences of lesson study, I also question the agendas of those who helped shape it along the way, especially as it was imported into western educational practice. The many interpretations of lesson study suggest a broader, more open definition might be necessary.

The second half of the chapter analyses the professional development attributes of lesson study. Key constructs such as teacher knowledge and teacher self-efficacy, which have been empirically linked to lesson study, are explored, and significant studies linking it to teacher change are reviewed.

This chapter concludes with an argument for lesson study to be adapted to the English context, focusing on its professional development potential. The purpose of professional development is then subsequently questioned in the next chapter.

3.1. History and Current Forms

Lesson study was designed in Japan in the late 19th century to modernise the curriculum and to prepare teachers to deliver it (Isoda, 2007). Currently, it is deeply imbedded into the Japanese educational system and forms an integral part of curriculum design and implementation processes as well as the development plans of most elementary and junior high schools (Kuno, 2014; Lee & Lo, 2013; Lewis & Takahashi, 2013). Lesson study was brought into the global education limelight when Stigler and Hiebert (1999) published their Trends in International Mathematics
and Science Study\textsuperscript{8} analysis observing the differences in Japanese and American lesson structures. Since then, numerous academics have praised its professional development values and subtle, yet discernible, differences have emerged as teachers across the world seek to adopt it and adapt it to their contexts (D. Corcoran et al., 2011; Dudley, 2011; Fernandez et al., 2003; Lewis et al., 2009; Marton & Runesson, 2015).

Japanese lesson study can be categorised into four theoretical schools (Wood & Sithamparam, 2015, p. 181) with distinct pedagogical influences: Hokkaido University (based on Soviet educational science), University of Tokyo (based on American educational research and didactics of progressive Japanese teaching), Nagoya University (based on Dewey’s philosophy and West German didactics) and Kobe University and Hiroshima University (based on East German didactics). The University of Tokyo (where lesson study was originally formalised in the early 1900’s) approach is the one most non-Japanese teachers and academics are likely to have been introduced to, promoted by prominent scholars such as Catherine Lewis and Akihiko Takahashi, organisations like JICA\textsuperscript{9} and programmes such as IMPULS\textsuperscript{10}. However, it is worth noting that even within the Japanese context, there exists multiple interpretations of lesson study, based on different underlying principles. Unfortunately, since most of the national literature is published in Japanese, the international community only has recourse to the exported version.

After a century and a half of lesson study, the current trend in Japan is both outwards-looking and inwards-facing: whilst much effort is concentrated on exporting the concept, most Japanese teachers continue to participate in broadly two types of lesson study: kyozaikenkyuu and jugyokenkyuu, respectively the ‘study of teaching materials’ and the ‘study of lessons’. In a survey of

\textsuperscript{8} TIMSS is an assessment conducted by the International Association for the Evaluation of Educational Achievement (IEA), which monitors the maths and science aptitude of fourth and eighth grade students across 60 countries, every four years since 1995 (Lynch School of Education, 2016)

\textsuperscript{9} The Japanese International Cooperation Agency is a governmental agency that coordinates Official Development Assistance (ODA) for the government of Japan.

\textsuperscript{10} The International Math-teacher Professionalization Using Lesson Study (IMPULS) Project established by the Tokyo Gakugei University in 2011 to export lesson study. I experienced it in 2013, when they paired up The University of Nottingham’s Bowland Maths team to train teachers at Midlands Secondary School where I was teaching at the time.
1701 Japanese schools in 2011, The National Institute of Educational Policy Research found 90% of elementary schools, 80% of junior high schools and 27% of senior high schools engaged in lesson study (Akita & Sakamoto, 2015). This indicates that like their UK counterparts, Japanese teachers might also place a heavier emphasis on exam preparation in secondary school or troublingly, perhaps they find it less suitable to secondary schools.

*Jugyo-kenkyuu* is often linked to the school’s in-training or *konaikenshu* goals. These goals can be maintained for many years (Fernandez & Yoshida, 2004) and multiple lesson study teams can interpret them and conduct lesson studies around them every year. As with the *konaikenshu*-informed type, lesson study in Japan can also be ‘bottom-up’, whereby groups of teachers get together organically to try and analyse and develop their own teaching or ‘top-down’, whereby local districts and the national government try to disseminate specific teaching methods (Lewis & Takahashi, 2013). Regardless of the purpose, the level of dedication into its design, implementation, and preparation for ‘open house lessons’ (public research lessons where external visitors can observe and take part in pre-lesson or post-lesson discussions), is resolutely unmatched in our equivalent versions, whereby such activities are distinctly undervalued in favour of more corporate workshop-style professional development.

Although Lewis, Perry and Hurd (2009) authored the most widely reported exported case of lesson study to the USA, where the majority of small-scale lesson studies were found to originate from (Xu & Pedder, 2015), the Ministry of Education, Culture, Sports and Technology (MEXT) has also allocated millions of yens to the further “spreading [of] the Japanese Educational Model” (Ogisu, 2016, slide 6), to help lesson study reach further corners of the globe, particularly in less developed countries such as Bangladesh and parts of Africa. Through her larger and more recent analysis of 125 articles, Ogisu found that the global spread was leading to a “re-evaluation and re-examination of LS in Japan” (slide 5) with some perceiving the export as “jugyo-kenkyu without substance” (slide 16) but others ironically claiming that “foreign lesson study is sometimes more ‘authentic’” (Toshiakira Fujii cited in Lewis & Takahashi, 2013, p. 208). The efforts of the Japanese government, through JICA, Tokyo University and other affiliated
organisations, to promote lesson study internationally could be due to them genuinely attributing their educational ‘successes’ to the process, but it can also be seen as part of Japan’s broader efforts to strengthen its ‘soft power’ (Nye, 2008), and thus improve the country’s popularity on the international stage.

Furthermore, Eastern Asian countries’ consistent high performance in international league tables have sometimes been attributed to stereotypes of societal pressure to perform in exams, however some are starting to challenge these dismissive presumptions. Unlike our Asian colleagues, “Anglo-American researchers have not seriously tried to make sense of East Asian approaches”, possibly due to “a lack of language abilities, career disincentives to spend time in the region, and the persistent legacy of colonial and modernisation theory worldviews that hold on to images of the West as the vanguard of global change and innovation” (Rappleye & Komatsu, 2018, p. 21). On the one hand, lesson study remains the product of Japanese policymakers from the 19th century; do we really expect it to be seamlessly replicable to a secondary school in London in the 21st century? On the other, does a post-colonial mindset blinker us from the potential of lesson study because it was not ‘grown locally’, despite the abundance of research indicating its effectiveness? The literature leads us to believe the reality is a mixture of both arguments. I would further conjecture that our non-holistic and trend-based approach to educational strategies might be the reason why established practices like lesson study struggle to take root: we are often more focused on short-term gains than long-term establishment, as perpetuated by the four-year election cycle which too often leads to major educational policy changes. Regardless of the politics behind the process, the history of lesson study indicates that perhaps there is more room for adaptation to the process than lesson study ‘purists’ might have us believe.

One excellent example of this is the well-reported off-shoot of ‘learning study’, which applies ‘variation theory’, developed from phenomenography, that is the study of the conditions required for people to change the way they experience a phenomenon (Ling & Marton, 2011) or more plainly, the study of the classroom conditions required for students to vary their experience of a
defined ‘object of learning’. Variation theory dictates that learning only occurs when the object of
learning is varied appropriately and is used in three different ways in learning study: (1) variation
of the students’ way or experiencing the object of learning, (2) variation of the teacher’s way of
preparing the object of learning and (3) variation as a “pedagogical tool” in choosing what aspects
of the object of learning to keep the same and what aspects to vary, hence developing a teaching
strategy to optimise learning. Marton (cited in Wood & Sithamparam, 2015, p. 20) posits that it is
more productive to analyse the case of a student who has “learned” to do something in one
situation but does something different in another situation due to perceived differences. In
hindsight, many of my earlier dealings with lesson study (explored in detail in Chapter 2) were
technically learning studies, with definable objects of learning like: (1) the use of diagrammatic
representation in organising solutions to mathematical problems (LS1), (2) an algebraic variable
as a pro-numeral entity (LS3), (3) visual and numerical representations of surds (LS4) and (4) a
taxonomical understanding of non-linear graphs (LS5). Since both lesson study and learning study
are conducted under the exact same procedures, the only notable difference between them is the
explicit mention of variation theory and the language around the latter (object of learning, critical
aspects of learning, etc) present in learning study. Marton and Runesson (2015, p. 108) argue that
learning study is simply a “study of the relationship between learning and the conditions of
learning” and that despite variation theory having been applied in all learning studies, it is not a
“defining theory”. With these blurred boundaries, I have found the differentiation between the
two terms to add nothing of value, neither to the lesson studies I have participated in, nor to this
research, and therefore will not distinguish learning studies from lesson studies in the practical
aspects of this work. Nevertheless, it provides an interesting case study of lesson study adaptation.

Learning study gained prominence through a series of projects commissioned by the Hong
Kong government in 2000, with the aim of developing strategies through which teachers could
support the “diverse needs of pupils in their classrooms” (Marton & Runesson, 2015, p. 108), as it
too attempted to shift to a more democratic educational system. The learning study model was
developed by a collaboration between the University of Hong Kong and the Hong Kong Institute
of Education, to be first presented at a lecture in 2001 by Morton (cited in Marton & Runesson, 2015), as a unique application of a Swedish theory of learning to the well-established process of Japanese lesson study. As well as the addition of pre-tests and post-tests, and other more research-oriented documentation, the aim was to strengthen the overall research components. Through these well-established organisations in another two countries considered to perform well in standardised international tests, a new version of lesson study was officially launched. Learning study could be viewed as a successful attempt to integrate lesson study culturally, although more evidence pertaining to the breadth of its influence would be required to support this claim.

Similarly, Chen and Yang (cited in Wood & Sithamparam, 2015) reported on “over 100 years” of lesson study in China (although their definition of lesson study could be questioned as it is rather broad), with early emphasis on teacher behaviour and more recently with a focus on collaborative action research, not necessarily geared on innovating teaching methods. This was referred to as “Chinese teaching studies” and involved a strategy of “de-contextualisation and re-contextualisation”, akin to the resolution of “cognitive dissonances” (Dudley, 2013), through which teachers reform their practice. They suggested, in line with Takahashi & McDougal (2016), that their lesson study required more “diverse meditational artefacts and tools, such as teacher discourse” cited in (Wood & Sithamparam, 2015, p. 16) in order to bring about more of this type of dialogue, for example Lewis and Perry’s toolkit (2017) or Dudley’s handbook (2011). They proposed the need for “outside researchers who are familiar with both theory and practice to be involved in the lesson study to cross borders of different discourses” (Wood & Sithamparam, 2015, p. 16) (i.e., Takahashi’s kushi or ‘knowledgeable other’). Essentially, the conclusion was to tighten the core lesson study aspects and bring the Chinese Teaching Studies more in line with actual lesson study practices.

Learning study and Chinese teaching studies demonstrate two distinct types of adaptation: one through the significant application of a pedagogic theory and the other through a broadening of the definition of lesson study to allow a more organic form to emerge. Rather than focusing on the distinction between learning study and lesson study or focusing on the specifics of ‘what does
and what does not constitute a lesson study’, I have found it more useful to conceptualise the variations in lesson study as a spectrum (see Figure 3.1 below): with the resource-based studies on one end and the more open-ended type on the other. Depending on the focus of the process-oriented study, it could further fall into one of two categories: *konaikenshu* (school development goals) skill-oriented (e.g., to develop the independent study skills of students through improved resilience) or subject-specific ‘object of learning’-oriented (e.g., to develop an understanding of an algebraic variable as a pro-numeral entity).

![Figure 3.1. The spectrum of lesson study](image)

As participants become more experienced in lesson study, they are likely to shift from the left to the right of the lesson study spectrum. This was observed by Lewis, Perry and Friedkin (2009, as cited in K. Wood & Sithamparam, 2015, p. 16) over a period of four years as a shift in focus “from product to process, from the development of a lesson per se, to the process of improving teaching”, through four identified factors: “increased use of reflection and feedback loops, refinement of protocols and tools, increased use of external knowledge sources and increased focus on student thinking”. Since lesson study moulds itself to the agenda of the group implementing it, it is unsurprising that when it is guided by an academic ‘knowledgeable other’, the research questions become deeper and more imbued with academic tendencies such as exploring the wider guiding principles behind the teaching of a particular subject. When led by a headteacher or senior/middle school leader, the focus can change to the embedding of particular
skill sets (such as resilience during problem-solving) or abilities (such as answering essay-style questions in History exams), in line with an organisation’s strategies for improvement. Newer teachers without the longitudinal experience of middle/senior leaders are more likely to be focused on their classrooms and refining their resources, although they are also often guided towards exploring pedagogical theories of learning through their initial teacher training courses, as delivered by universities or colleges.

Lesson study takes many shapes and forms, which some (purists) deem ‘shallow’ or ‘less authentic’. However, it can be argued that the flexible nature of lesson study is crucial. Although it might be tempting to judge the process-oriented lesson study as more ‘advanced’, the direction of a lesson study is based on the situation the participants find themselves in. In a team with non-subject specialists or in the event of major changes made to the curriculum, it might be more directly beneficial for teachers to discuss practical ways in which they could deliver their lessons, rather than more philosophical or axiomatic questions like “the purpose of the x in algebra”. The nature of a particular lesson study is often evident through the phrasing of the lesson study research question. For example, “To what extent can STARR ‘fix-it’ time, focussed on students spotting mistakes in answers to exam questions, improve student performance in mathematics?” (Anthecology Issue 1, 2015, p. 49) is fixated on the use of a particular activity (spotting mistakes during STARR ‘fix-it’ time). Two years later, the more evolved question “To what extent can scaffolding problem solving questions build students’ confidence when tackling multi-stage contextualised problems?” (Anthecology Issue 3, 2017, p. 15) demonstrates a shift of focus towards a general technique (scaffolding) for the purpose of affecting a student quality (confidence). Interestingly, both are exam-driven, as opposed to the subject-driven questions I have experienced, possibly indicating a different interpretation of the overall purpose of lesson study by the teachers of Samuel Whitbread Academy.
Elementary Breakdown of Lesson Study

From the deliberately vague initial definition of lesson study and the thematic arrangement of Figure 3.1, five distinct phases of lesson study emerge, with infinite possible accompanying elements (Dudley, 2014; Lewis & Hurd, 2011; Stepanek et al., 2006):

1. Putting the team together
   a) Often led by someone with previous experience of lesson study (could be a kushi or ‘knowledgeable other’ who is a consultant or academic external to the school)
   b) Establishing a planning team (including the logistics of organising meetings and lesson observations)

2. Framing the research focus
   a) Picking a challenge, common issue, or general education goal
   b) A pre-test, focus group or interview could be used to refine the issue as experienced by students
   c) Academic literature can also be consulted, or online research conducted
   d) The problem can be conceptualised through a research question, or a set of research aims

3. The planning, teaching, and observation cycle
   a) Practising the lesson(s) or parts of it, on another group or with a few students (the ‘rehearsal lesson’) to get an initial reaction from students (particularly useful if looking for a more refined public lesson as the outcome of the lesson study)
   b) Writing a (detailed) lesson plan and sharing all accompanying documents prior to the lesson study with observers outside of the planning team
   c) Planning a series of lessons, not just an isolated piece of work and considering how the lesson fits into the grand scheme (of work)
   d) Recording the lesson study though: notes, videos, audio recordings of meetings, photographs of students’ work, etc.

4. The research lesson
a) Problem-solving, rich, or enquiry-based tasks are often required to stimulate student discussion (for the sake of observers)

b) Demonstrations of progress for public lessons, through worksheets or concluding tasks which exemplify discrete learning points

c) The four-part Japanese lesson model (Inoue, 2012) might be applied: *hatsumon* (giving students a rich, open-ended problem), *kikan-shido* (students work individually or in groups as the teacher circulates and guides learning appropriately), *neriage* (the essential consensus-building discussion where a comparison is made amongst different student strategies and key concepts are extracted and highlighted) and *matome* (a summary of the lesson, discussion on generalisability and applications of concepts explored)

5. Reflection and dissemination

a) Post-lesson discussion (may be chaired by the *kushi*) wherein the planning team share their findings, with reference to students’ work, comments, or reactions

b) Assessing the impact on students (may be through a post-test or evaluative final task)

c) Reflecting on the final outcomes and writing a post-lesson report (this could include a section on the practical implications of the lesson study (sharing the successful tasks with other classes/teachers, redesigning aspects of the syllabus, etc.))

d) Another teacher in the planning team teaches the same lesson to another class, with an amended lesson plan

e) Online dissemination of findings through lesson plan, report, videos, etc. (potentially through the school website, or the World Association of Lesson Study Journal)

Each of the above elements influence the nature and outcomes of a lesson study: an academic *kushi* can guide the research question, the make-up of the planning team affects the dynamics (if the headteacher is part of your planning team, you might be less inclined to share certain ideas or
thoughts) and putting on a public lesson means that the style of lesson delivery will lean more towards inquiry-based group learning. This means that the majority of public lesson study adopt a style completely contrary to the pre-dominant teaching style in our day-to-day lessons. This is neither good nor bad, but merely an avenue to explore teaching and learning processes in a collaborative manner.

If the overarching purpose of lesson study is to help teachers improve their teaching, the open nature of the processes enables participants to take infinite routes towards achieving this, much like teaching in general. None of these routes can be said to be superior to the others, only more suited to the context in which the participants operate in. At Midlands Secondary School, it was possible for me to spend 25 hours taking part in a lesson study; a group of four highly motivated young single teachers without familial responsibilities can do this in their own time after school but it would not be reasonable to ask this of all teachers in a school.

The brief history of lesson study, spectrum of lesson study and list of possible accompanying elements all demonstrate its myriad variations, and therefore call for a wider, more dynamic definition of lesson study: no longer as the sum of its discrete parts, but as something more abstract, whose form depends on its social environment. If lesson study can take infinite forms, then what are the boundary concepts which form its definition? This is something I now explore through the effects of lesson study.

3.2. Effects on Teaching

The effectiveness of lesson study could be evaluated through various constructs, including aspects of student learning. Indeed, the betterment of student learning is the ultimate purpose of lesson study. However, the formalised learning which takes place in a classroom, is necessarily an outcome of teaching. The variable elements during a lesson are the aspects of teaching, as a result of which learning is spurred, and a legacy is left on teaching approaches. If lesson study is about assessing the needs of the students, then it is a teacher who is conducting this assessment and
prescribing a solution. Therefore, the purpose of lesson study can be summarised as the **adaptation of teaching for the betterment of student learning.**

The ‘quality of teaching’ has been well evidenced to be the largest impactor on student outcomes (Crenna-Jennings, 2018), therefore it makes sense for this thesis to focus entirely on the development of aspects of teaching, through the process of lesson study. As well as the alleged outcomes of lesson study for students (enhanced learning experiences in the short-term through improved instructional materials) and the field of mathematics instruction or pedagogy (long term enhanced learning experiences for students through improved teacher knowledge) (Lewis, 2016), there are well-documented professional development outcomes for teachers both in the short-term and long-term following their engagement in lesson study or lesson-study-like activities (Xu & Pedder, 2015). Indeed, when fully imbedded into a system, these outcomes have even been linked to continuous professional development at the national level, as in the case of Japan (Cheung & Wong, 2014).

**Teacher Knowledge**

Pedagogical content knowledge (PCK) was divided into seven domains or “sets of cognitive schemata” by Shulman (1987): (1) general pedagogical knowledge, which includes broad principles and classroom management strategies (2) knowledge of students (3) knowledge of subject matter (4) pedagogical content knowledge, that is knowing how to teach one’s subject (5) knowledge of other content (6) knowledge of the curriculum and (7) knowledge of educational aims. The literature bears multiple references to the impact of lesson study on teacher knowledge:

1. A development of teachers’ three “critical lenses”: the researcher lens, the curriculum development lens, and the student lens (Fernandez et al., 2003)

2. Collaboration amongst teachers and other educators leading to an increase in multiple aspects of teacher knowledge (D. Corcoran et al., 2011)

3. The mapping of specific phases of lesson study to increased teacher knowledge (Tepylo & Moss, 2011)
4. Development of “teacher capacity” through increased knowledge as well as increased motivation or self-efficacy (D. Ball, 2001)

5. Teachers observed two years after their participation in lesson study, hypothesised to have “sustained change in their pedagogy, personal beliefs and assumptions” based on their lesson study experiences (Olson et al., 2011, p. 53)

Unfortunately, the link between the clear temporal benefits of engaging in lesson study to long-term improved learning outcomes is at best correlational and at worst an unfounded leap made by keen lesson study participants. For example, there are many accounts of self-reported short to medium-term changes in teacher beliefs about specific teaching strategies (e.g., problem-solving tasks in mathematics) very few of which then attempt to follow these up. Yet, when it was originally unveiled to the world, the longitudinal dimension of lesson study was apparently evident: “Lesson study is a process of improvement that is expected to produce small, incremental improvements in teaching over long periods of time” (Stigler & Hiebert, 1999, p. 121).

Thus, whilst a conceptual framework involving teacher knowledge can be very useful to theorise teacher change, it clearly also has some limitations, which are further explored in Section 4.2. Theories of Professional Learning.
Dispositions

![Diagram of dimensions of practical thinking and knowledge](image)

**Figure 3.2. The organisation of the dimensions of practical thinking and knowledge**  
(Peña Traper & Pérez Gómez, 2017)

Whilst increased knowledge is required for professional development, it is also not sufficient to cause practical changes in the experiences of teachers and students in the classroom. To make the leap from ‘knowing’ and ‘doing’, Peña Traper & Pérez Gómez (2017) link participation in lesson study with the “the reconstruction of teacher dispositions”. The authors note a gap between espoused beliefs and actual actions as “two areas of knowledge: the knowledge we gather in our interactions with the world of ideas; and the knowledge we actually use to act effectively in a specific situation” (p. 67). By drawing on seminal psychological advances such as Kahneman’s (2011) ‘Thinking, fast and slow’, they pit “practical knowledge” (the fast thinking betrayed by how we teach and referred to by Dudley (2013) as “tacit knowledge”) against “practical thinking” (the slower, deeper and more reflective type of thinking involved in lesson study). Assuming that transformations in teaching practice are always preceded by transformations in “practical knowledge” and beliefs, they evidence “changed beliefs” incurred through “practical theorising” during the process of lesson study. Peña Traper & Pérez Gómez (2017) also introduce the crucial mid-layer of “dispositions” to the beliefs-actions spectrum (represented in Figure 3.2), upon
which they note that the participants of “intellectually curious” and commitment-driven dispositions benefit the most from lesson study.

The concept of dispositions is explored in more depth, from a sociological perspective, in Section 5.2. Conceptualising Teacher Change.

**Teacher Self-Efficacy**

Beliefs, which can be seen to be more psychologically ingrained than dispositions, have been found to act as a significant barrier to teacher change (Battista, 1994). If professional development is to either change or provide a means of enacting beliefs, teacher self-efficacy (TSE) has been identified as a specific mediating or filtering mechanism for the efforts and actions to do so (Wyatt, 2016). Self-efficacy is the belief in one’s capability to enact change, akin to a sort of visualisation of success prior to engaging in an activity and the subconscious root to more surface-level psychological constructs like motivation or self-esteem. Rather than relying on vague evaluation criteria, “TSE presents a suitable construct that goes beyond attitude change and commitment to change, it has the potential to measure the effects of PD on student achievement, albeit indirectly” (Watson, 2016, para. 22).

The case for including self-efficacy as a measure for the effects of lesson study is further strengthened by Puchner and Taylor (2006, p. 925):

*People are more likely to choose a task in which they have high self-efficacy and to avoid tasks in which they have low self-efficacy. A person will also try harder to complete a task in the face of obstacles if they have high rather than low efficacy related to that task. People are also more likely to take responsibility for their actions if they have high self-efficacy... High teacher efficacy has been shown to be related to several positive outcomes. For example, high efficacy teachers are more likely to communicate high expectations for student performance, to persist longer in working with students, to have warm relationships with students, to view low-achieving students positively, to have an impact on low-achieving students, and to confront management problems. Low efficacy teachers are more likely to*
criticize students, to desire control, to use embarrassment and punishment, and to ignore low-ability students. High teacher efficacy is also linked to adoption of innovation and change in teaching.

Lesson study can be broken down into various components and it could be that some of these are more conducive to change or improved TSE and some may hinder them. Most likely, contextual constraints will have a negative effect on teacher change and it might simply be a matter of whether the positive effects of lesson study can outweigh the negatives. Some aspects of lesson study which might yield higher TSE include student-centred observations (as opposed to teacher-centred), a solution-centred approach whereby a problem is diagnosed and there is shared responsibility (but there is no direct accountability) for finding possible solutions, and freedom from exam criteria so teachers can consider the intrinsic purpose of education/their subject.

**Significant Studies Linking Lesson Study to Teacher Change**

![Diagram of lesson study pathways of impact](image)

Figure 3.3. Lesson study pathways of impact

*(Lewis, 2016)*
Lesson study is said to be effective in creating opportunities (through its specific mechanisms) for educators’ professional development (resulting in internal or external change) which eventually result in instruction and student learning improvements, as per Figure 3.3 above.

These pathways of impact and outcomes have been researched in a range of contexts, four of which are focused upon next, as significant in various rights and to establish a particular niche for my contribution to the body of research on lesson study for the purpose of facilitating professional development. Here, professional development constitutes the activities undertaken for the purpose of (directly or indirectly) adapting teaching (through observable constructs such as methods, techniques, routines, materials, etc).

(Case 1) Lewis et al. (2009) were amongst the first to evidence the benefits of lesson study outside of Japan through their report on a US district with more than four and a half years of “successful LS”, growing from 28 teachers to 63 teachers by the end of the research period. Yoshida & Jackson (2011) on the other hand, suggested that these US lesson study groups did not have the content and pedagogical knowledge necessary to conduct high-quality lesson studies. They proposed that teachers utilise pre-packaged materials produced in other countries, under stronger content and pedagogical knowledge. Accordingly, Lewis and Perry (2017) developed a lesson study toolkit with mathematical problem-solving tasks and conducted a randomised controlled trial (RCT) to test its effectiveness in improving both teachers’ and students’ understanding. The RCT of 213 teachers and 1059 students from 27 US school districts concluded in favour of the lesson study group which used the toolkit. This group also demonstrated an increase in “collegial learning effectiveness, [their] expectations for student achievement and [the] perceived relevance of research for practice” (Wood & Sithamparam, 2015, p. 13). Lewis and Perry then repeated their RCT with the same results, in an attempt to encourage a new “more scalable” model of lesson study, through the creation of lesson-study-specific resources which teachers could adopt and adapt.

Whilst the creation of such toolkits to facilitate lesson study would make the process more accessible for those new to it and eliminate reliance on a knowledgeable other, the quality of such
a toolkit will no doubt have a major effect on the quality of the lesson study. It is also not hard to see how the teams with a toolkit of well researched resources, alongside the opportunity to explore this in a group as part of lesson study, would have made better mathematical progress (academics essentially guided their lesson plans). However, from a professional development standpoint, teachers performing lesson study without the toolkit might benefit more from the process: their research skills might improve more in the long run. Secondly, whilst an RCT does a good job of producing a firm positivist verdict like ‘yes, it works’, the input of lesson study (and in this case, with the added complication of the research toolkit) is not easily traced to the ‘output’ of improved performance on tests. However, for the purpose of scaling up lesson study (or any other similar interventions), the researchers might have been more interested in the concrete means through which they can propagate lesson study on a wider scale, and this was perhaps of little relevance to them. And finally, since schools signed up to this intervention, they are unlikely to have been ‘problematic’ environments such as the one I am reporting on and therefore more likely to provide the appropriate steppingstone to spread lesson study from. Thus, this remarkable research spanning decades on the effective importation of lesson study does not provide any answers to my particular issue of providing supportive professional development to teachers of diverse needs in a challenging school. Crucially, such a positivist approach to lesson study research would erase the contextual elements, rather than address them, as it takes an overly simplistic approach to teacher change completely contrary to that which I am attempting.

(Case 2) Spurred by a 2004 conference speech by Catherine Lewis and scholars from the University of Tokyo, before being spearheaded by the National Institute of Education (NIE) from 2006-2009 and then the Ministry of Education (MOE) in 2010, the Singapore case has seen hundreds of schools actively participating in lesson study (Wood & Sithamparam, 2015). Theirs resulted in a dilution of the “spirit and substance of LS” due to the time constraints and workload pressures as well as the “strong drive towards performativity”, with only some minor successes reported. This is precisely the type of result I would anticipate from a poorly designed or forcefully imbedded instance of lesson study.
There are many cultural and systemic factors underpinning the success of lesson study in Japan, where it has been gradually implemented over a long period of time. These must be borne in mind when ‘transplanting’ the concept or assessing its effectiveness in different contexts, as with the cases cited here. The National Institute of Educational Policy Research (NIEPR) in Japan published a survey in 2011 on the use of lesson study in Japanese schools, indicating correlations between elements of lesson study and a School Quality Index (based on student achievement and other relevant factors) (Wood & Sithamparam, 2015, p. 30). Their findings suggested that lack of depth or elementary differences in the enactment of lesson study had an effect on the performance of students (although this was shown through a questionable causal link, whereby many social factors were not accounted for). Therefore, in adapting lesson study to my context, I must aim to produce a template of lesson study which is ‘lighter’ but not devoid of transformative potential.

Whereas Case 1 can be quoted as a rigorous piece of research determining the effectiveness of lesson study, it is Case 2 which begins to map the ‘quality’ of lesson study to its effect on students. This topic is picked up by Takahashi and McDougal (2016), who defined five features required for more effective lesson study: the purpose of lesson study should be to develop expertise or learn something new (not refining a lesson), it should be part of a larger (school-wide) project, it should include significant time spent on kyouzai kenkyuu (the study of instructional materials), it should be conducted over several weeks (not a few hours) and a ‘knowledgeable other’ should be involved in the planning and post-lesson discussion. As a result of these distinctions, Collaborative Lesson Research (CLR) was termed to contain the following compulsory elements: (1) a clear research purpose, (2) kyouzai kenkyuu (3) a written research proposal (4) a live research lesson and discussion (5) knowledgeable others and (6) sharing of results. Once again, these researchers were amongst many to narrowly define their version of lesson study, based on their experience and research, to suit their context.

(Case 3) Elliott notes that learning study was funded by the Swedish Research Council to “make an original contribution to pedagogical knowledge in the field of science education, in a form that other teachers may find more useable than the decontextualized findings produced by
more traditional research” (cited in Wood & Sithamparam, 2015, p. 19). His evaluation of the Hong Kong Government sponsored three-year project entitled Variation for the Improvement of Teaching and Learning (VITAL) from 2003 to 2007 (Elliott, 2009) had concluded that the Hong Kong lesson study had created the necessary conditions for the “production of pedagogical knowledge in propositional and actionable form”, although there was “little evidence of transference of knowledge and skills (capabilities) into normal practice in classrooms” (Elliott, 2009 as cited in K. Wood & Sithamparam, 2015, p. 19). By some definitions of professional development, this would make that lesson study rather ineffective. Instead, Lo (cited in Wood & Sithamparam, 2015, p. 13) reported positive results from a survey on the impact on 334 teachers and 60 principals within the VITAL project, with improved self-assessed teacher competencies such as teacher capability, collaboration, and professionalism.

Similarly, in Brunei reports that “learning study has more of an impact on the learners than lesson study” (Wood & Sithamparam, 2015, p. 96) identified the shortcomings of lesson study in not providing any strategies for the group to proceed when they get “stuck”. But I would argue: did Variation Theory really help plug that gap? What about if you don’t know what you need to vary? Surely, you need the right knowledge around the table first and a skilful ‘knowledgeable other’ would have done the job just as well, if not better. This sentiment was echoed by Wood & Sithamparam (2015, p. 15) who questioned “the roles of theory in guiding teaching design, beyond those tacit theories that teachers bring to the dialogue”.

It is clear that the “varieties and adaptations to suit [their] particular contexts and needs” are an important revelation in the differences in how lesson study “is conceptualized and understood, organized and implemented” (Wood & Sithamparam, 2015, p. 41), despite concerns that these might “dilute the essence of LS”. This runs counter to the strict guidelines Takahashi and McDougal (2016) offer and present anyone attempting to lead a lesson study with a dilemma: how much of the ‘original’ lesson study framework can be compromised?
Indeed, since lesson study is old and broad, there are many related and arguably overlapping concepts amongst itself and other forms of professional development: lesson study, learning study, design research, action research, collaborative lesson research, participatory action research and so on. There are indeed endless forms of collaborative research taking place in educational settings and whilst lesson study is the topic of discussion, many of these would fall under its definition and are simply referred to under different guises. The varying jargon is a superficial difference as the underlying concepts might be the same. Again, this calls for an understanding of lesson study which accepts its broader variations, without simply verbosely synonymising ‘general collaborative practice’.

(Case 4) Contrary to these broader studies, Mynott (2017) delves into the “black box” of teacher development to model the outcomes of potential teacher learning as shown in Figure 3.4, based on the lesson study’s potential to create “cognitive dissonance” (moments of learning). This was also the term used by Dudley (2013) to describe the acquisition of teacher knowledge, in his district-level lesson study initiative within the London Borough of Camden, which he interpreted as “classroom action enquiry [to develop] new practice knowledge”, focusing on “case pupils” and analysing teacher discourse “as a window on teacher learning”.

Extending the model further, Mynott also argues that if these cognitive dissonances are sustained or acted upon, they can lead to change in the individual teacher’s practice or in the school’s structures, much in line with my more action-focused view of professional development as well as Lewis’ (2016) “pathways of impact”.
Whilst the purpose of this study bears much resemblance to mine, the notion of “rich learning dissonance” still fails to convey the socio-psychological complexity of translating gains in teacher knowledge to changes in teacher practice, creating a need for a more theoretically explicated case study.

Case 4, which is most similar to my work, both in terms of size and purpose, begins to map the varieties of outcomes of lesson study. As an enlightening piece of ‘insider’ research, it also begins to explore the contextual inhibitors surrounding lesson study but does not define the varieties in the process itself, nor the varieties in the participants. These unexplored dimensions therefore leave me a very specific niche to inhabit: configuring the input and output of lesson study, within defined and acknowledged contextual barriers and constraints.

### 3.3. Gaps in the Literature

Ontologically, there is a dangerous potential for confirmation bias in much of the lesson study literature, in that virtually everyone (myself included) has already bought in to lesson study before claiming to undertake our ‘objectively neutral’ research projects. Secondly, lesson study “presupposes what it promotes” (H. Y. Law, 2013, p. 111); that is, it aims to enhance teacher knowledge (particularly subject, pedagogical and student knowledge) but it clearly requires some of this knowledge to begin with. The idea is that through the application of the correct research procedures and given the right level of motivation, teachers will be able to drive their own
knowledge improvement based on whatever base knowledge they hold (not necessarily pedagogic or subject-related). Law (p. 109) also suggests an “alternative theoretical syntax for LS based on Dewey’s concept of experience and Peirce’s concept of practical belief and judgement”. His interpretation of transformative change of teacher practice is through a “triad of changes: a change of language, the transformation of a gaze and the metamorphosis of the teacher” (p. 106). Whilst these aspects do not correspond with my more objective observable aspects of teaching, they provide a useful potential mechanism through which teacher change may be actualised.

Furthermore, the “lack of deep common understanding of how effective lesson study promotes teacher professional development” persists (Law, 2013, p. 106). Each of the four cases from the previous section focuses on medium/large-scale analyses and contribute another shortcoming: the assumption of genericity in the lesson study methodology employed by each group to form overly broad generalisations about its benefits.

**Lesson Study as a Method**

This chapter has continuously for a broader definition of lesson study and now proposes it is conceptualised as ‘method’, in the sense that “methods inhabit and help to reproduce a complex ecology of representations, realities and advocacies, arrangements and circuits” (J. Law et al., 2011, p. 13). This ‘ecology’ has been touched upon, and the ontological implications are now discussed.

Methods are socially constructed yet they also play a part in constructing our notions of the social world. This simple concept lends sociological complexity to these methods, above the usual ontological and epistemological concerns of the researcher attempting to apply them.

If lesson study is to be conceptualised as a method in this sense, then it is attempting to unravel the realities experienced by students as they grapple with various aspects of learning. These experiences vary based on the students’ prior knowledge base and how the new knowledge is presented to them. The collaborative analyses of the students, the aspects of knowledge and the social contexts, as they are explored individually and in relation to each other, form a lesson
study. However, since lesson studies are designed and enacted by teachers, the teachers, their knowledge, and social contexts also shape the lesson study. In this way, the students, the teachers, the social contexts, and the lesson study inextricably inform, and are informed, by each other. This is echoed by the ‘double hermeneutic’ of social science whereby the object and the subject of social research “interact dialogically and co-inform one another within the research process” (Mills et al., 2010b, p. 323) – a concept which I later apply to inform my methodological choice of the action research paradigm.

Whilst some might want to delineate the students and the advancement of their learning as the primary purpose of lesson study, the inextricability of the students, teachers and contexts imply that they simultaneously constitute the ‘purpose of lesson study’. Therefore, it is an empirical choice to focus on specific aspects, based in fact, on the researcher’s purpose, aims or agenda. My purpose is the broader betterment of the educational systems I encounter, in terms of their dual capacity to support and ‘educate’ students. Within my limited sphere of influence, this is something I aim to do pragmatically through the design of structures and cultures, which empower the teachers within my leadership to enact this purpose. On the other hand, my agenda within my role of middle leader at the Academy, has also rendered this research into an attempt to solve some of the specific contextual problems I encounter.

These questions of purpose, aims and agenda form part of the “ontological politics” (Mol, 1999) of lesson study, which were initially broached in Chapter 2 as one of the present practical issues interfering with lesson study effectiveness. Furthermore, there are options between the versions of lesson study, therefore how and why specific aspects of lesson study implementation are chosen by, or imposed on, the participants, also lends further social nuances to its enactment as a method.

These deep sociological aspects are only explored as far as their ability to explicate lesson study. Ultimately, as I have made clear through the early establishment of my research principles (Page 20), this thesis is a pragmatic pursuit. In line with this, lesson study can be conceptualised
as a method which somehow improves teaching for the ultimate betterment of student learning. A lesson study’s purpose is its actualisation in the classroom, and decidedly not esoteric explorations. The question ‘how does lesson study achieve this improvement of teaching?’ is further pursued after the establishment of the theoretical framework, in Chapter 5.

**Lesson Study Implementation Strategy**

While the mathematical content and skills we teach across the globe are roughly the same, the way we structure and deliver this content can be radically different. None can be said to be more effective than the other with absolute certainty, for each one is deeply ingrained in its contextual backdrop. However, it is worth noting that the lesson study process, as we have come to import it, is specifically suited to its Japanese backdrop and other than stripping away certain aspects, no serious attempts have been made to grow a purely English version of lesson study. This is a noteworthy symptom of a broader gap in the literature: due to its generally positivist stance, no serious attempts have been made to map out the ‘background processes’ of lesson study. To draw a parallel, if medical practitioners behaved the way education reformists have done regarding intervention, they might have skipped the biological foundations necessary for the interpretation of symptoms in preference of medical trials. Key to our overall endeavour as teacher researchers and general ‘tinkerers’ is our definition of what constitutes a worthy education. Whilst this may not be up for debate, our entire practice is directly oriented towards this widely interpreted and contested notion of a ‘curriculum’, the various forms and mechanisms of which could be said to affect our ‘pedagogic ontologies’.

The Japanese idea of a curriculum is a much more dynamic thing, akin to Stenhouse’s concept of a process-based curriculum as opposed to the objectives-based one we currently use (Wood & Sithamparam, 2015, p. 150). In comparison, the typical Maths curriculum in an English secondary school is likely to adopt a ‘spiral approach’ whereby topics are explored in a repeating pattern annually, with incremental depth. The ‘scheme of work’ is often interpreted as a tick list of topics to work through. The delivery of content follows a particular lesson template, sometimes explicitly prescribed by the school. For example, a typical Maths lesson conjures up a 10-minute
settling task, 40 minutes of interleaved teacher exposition and student tasks, and a 10-minute plenary task. Assessments and homework are based on the topics explored in lesson but there are also regular summative assessments conducted for the purpose of grading students and mapping their progress.

Our choices of ‘pedagogic methodology’ highlight further differences in our approaches. Japanese lesson studies have a very clear constructivist grain: the lessons are designed to be “swiftly flowing rivers” where the teacher guides students to make discoveries as opposed to transmitting information. This is exactly what impressed Stigler and Hiebert (1999) when they observed the four-part Japanese lesson. Japanese students can thus be seen to regularly participate in group-tasks and to express their opinions about their subject (which would be unusual in an English maths lesson). Even the use of the blackboard in Japan is said to be an art in itself, whereas this is decidedly not a subject of professional development significance in England.

The potential of lesson study in informing policy was reported on in a special edition of the International Journal of Lesson and Learning Studies through: “first, nationally designated research schools that allow rapid prototyping of the reform; second, robust professional networks that bring together teachers from different schools, allowing the knowledge generated to flow across institutional boundaries and finally learning routines (such as LS)... where reform ideas and its implementation in classrooms are systematically studied” (Lee & Lo, 2013, p. 202). Takahashi, Lewis and Perry (2013) rebutted with four challenges currently facing teachers implementing lesson study outside of Japan: (1) supporting teachers to implement the reforms through lesson study, (2) teachers’ levels of ownership over the reform, (3) the role of public research lessons and (4) the tension between government-sponsored as opposed to teacher-initiated lesson study.

Lee and Lo (2013) also argued that lesson study has the potential to bring an intended curriculum to life in the classrooms. Lesson study essentially provides formative feedback on reforms (from the micro-level of teaching strategy variation to the macro-level of policy change),
however, in light of Takahashi, Lewis and Perry (2013)’s highlighted challenges, it might be more straight-forward for the purpose of implementing school-based reforms rather than national curriculum ones in the English context. In fact, the wider interpretation of ‘curriculum’ is one which we are only now starting to adopt with a recent Ofsted shift of focus onto this. The reaction of mine and no doubt many other schools, has been to develop templates with regards to the skills we hope to foster in students for our particular subjects and re-design our curricula around these.

Easier said than done! Our Maths provision consists of 6 lessons a week. For 42 weeks a year over 5 years, this results in 1260 specific lessons. Deep reflection on the structure of each of these lessons, cross-referenced with the curriculum learning points, is a mammoth task which most schools will not have the capacity to undertake. And even if they did, there would probably be further changes imposed by a new government to consider along the way. Indeed, the rapid pace of change in the education systems in England means that we never get more than a year to design and implement teaching plans and another year to evaluate the strategies put in place, before something substantial changes again and we need to re-dedicate our focus.

Sometimes, the effects of certain changes are still being felt three to five years down the line as the practical implications are revealed and relevant organisations respond to the changes too. For example, the GCSE curriculum and exam changes came into effect in 2016, to much fear and panic for that year’s cohort of students and each year since then, we have discovered changes which need to be implemented in response to this. For example, since two out of three of the papers require the use of a calculator, we now teach ‘calculator skills’ to all students from Year 7. Therefore, it makes sense to focus my version of lesson study on developing aspects of this new curriculum which can then be permanently imbedded into our schemes of work. This also ensures that, as a team, we are not doubling up our efforts in that we would be using lesson study to achieve an existing task.

*Why* we apply lesson study is intrinsically linked to our interpretations of curricula, pedagogy, and education, such that effective lesson study cannot occur without a consideration of these big
ideas. However, how we apply lesson study has to be in line with the broader national demands guided by policy and is therefore not realistically completely open to adaptation.

**Professional Development and Teacher Change**

Lesson study can be a useful tool to implement top-down strategies. Mathematics teachers across the country were recently told to teach more ‘problem-solving’, yet even equipped with resources, how are we to develop a completely different way of teaching? Rooted in the classroom, lesson study takes teacher research out of libraries and forces us to face our students and consider them at the heart of our practice. A pragmatic form of action research, lesson study appears to yield true long-term solutions (not the quick fixes prescribed by so many educational trends and fads) and a powerful means of professional development, leaning more towards academic research (without the esoteric jargon and without losing its practicality to the classroom).

Just as the Japanese have their *konaikenshu*, English teachers have our own concepts and practices of professional development. Rather than a marriage with existing approaches to professional development, what we have seen so far has been the use of lesson study as an ‘add-on’ to existing (arguably deeply flawed) practices. To further aggravate this, professional development itself is often seen as an ‘add-on’ to essential school activities, which can then make lesson study even more insignificant as it turns into ‘an add-on of an add-on’.

With a view of professional development as the key to enacting necessary changes, lesson study can be seen as a key driver of educational change. Previously miscast, the term professional development has been condemned by many educators. In the next chapter, I propose we rethink our idea of professional development and acknowledge its transformative potential, in line with endless evidence (D. Ball, 2001; Battista, 1994; Dudley, 2011; Elmore, 2002; Fernandez, 2002; Kratzer & Teplin, 2007; H. Y. Law, 2013; Lewis, 2016; Wood & Sithamparam, 2015). Lesson study presents an effective and sophisticated framework which can be moulded to a range of contexts and adapted to suit a range of needs. As well as giving teachers the time, space, and
structure to critically analyse their work, it can enable them to develop professionally and to work together to design solutions to common issues, thereby addressing multiple requirements through one single process.

If professional development is used as an opportunity to tackle some of the contextual challenges of the hectic English secondary school, then lesson study might be a nifty means of implementing such a strategy.
4. Teacher Professional Development

Chapter 3 found evidence of lesson study positively effecting teacher knowledge, dispositions, and self-efficacy. However, it also took issue with the assumptions of genericity in lesson study methodologies when forming generalisations about these effects, especially considering the vastly differing international contexts in which it is being implemented. Most importantly, it found that advocates of lesson study as a tool for professional development failed to position it within this domain in a manner which acknowledges both the latter’s diversity of form and the diversity of these settings.

In this second part of the literature review, existing theorisations of teacher professional development are explored to find a more appropriate means of explaining the effects of lesson study without diminishing the contextual elements uncovered in Chapter 2, whilst addressing the limitations explored in Chapter 3. In detailing the unsuitability of these theorisations, an argument is established for a novel theorisation of lesson study and professional development, established through the theoretical and conceptual frameworks in the subsequent chapters.

4.1. Defining Professional Development

If professional development is to be taken literally, then it can be broadly defined as the “development of a person in his or her professional role” (Villegas-Reimers, 2003, p. 9). Villegas-Reimers categorises this as either happening informally (through general activities such as reading) or formally (through participation in workshops, meetings, etc.). A teacher would normally be considered a professional by measure of their specific skills, formal education, and experience, often determined by a governmental institution. However, since some English teachers are technically ‘unqualified’, this is not always straight-forward. For the sake of simplicity, the term ‘professional’ will therefore be employed in reference to the daily activities a teacher takes on, complementing the direct instruction of students, and encompassing pastoral care and administrative responsibilities. Whilst it is acknowledged that other educational practitioners influence student learning, my subject is to be restricted to teachers only. In so
doing, I am ensuring my focus remains on the educational variable with the greatest potential for impact on student performance (Crenna-Jennings, 2018).

In the context of this thesis, **professional development constitutes the activities undertaken for the purpose of (directly or indirectly) adapting teaching**. This is considered from a more practical angle than ‘professional learning’, which could be interpreted as the mere acquisition of teacher knowledge. Professional development is defined through activities because evanescent thoughts are assumed to be the natural result of engagement with an external concept or object, and these are required to transition into actions directly or indirectly. For example, the reading of academic journal articles only constitutes professional development if it is accompanied by some sort of significant internal change to one’s attitudes or beliefs in relation to teaching or education. This is assumed to indirectly affect teacher actions as actions are assumed to be rooted in socio-psychological constructs like beliefs and dispositions and these may consciously or subconsciously inform decisions.

The ‘purposefulness’ of the act means that it must be deliberately carried out with the intention of development, in the same way that a professional footballer playing football with their child is different to their play during an official practice session: the former is intended for pleasure and the latter for the deliberate refinement of one’s skills. Equally, an act which may appear passive such as reflecting on a recently-taught lesson constitutes professional development if one is not only critically assessing the components of the lesson and mapping this to the achievement of pre-determined educational goals or objectives, but also consequently determining a course of action as a result of these internal deliberations (e.g. I will not use sorting cards with this class again as it failed to provide a structure to support student thinking about the nature of quadratics). Professional development is therefore reflexively defined in terms of its outcomes, either intended or actualised. Professional development activities which do not (eventually) result in concrete changes to teaching practices constitute stunted professional development, since they fail to meet the primary aim of impacting learning.
It is important to note that there exist vastly differing definitions and approaches to professional development, underpinned by a multitude of theories (often of a social constructivist nature) from a range of fields (psychology, sociology, education, economics, and linguistics to name a few) and involving very many constructs (for example, teacher identity, beliefs, and self-efficacy). By analysing the way others have defined and deconstructed professional development, I inform the basis for my own conceptualisation of professional development, specific to the purpose of my research.

In a report on teacher professional development (Sims & Fletcher-Wood, 2019), the authors propose a useful taxonomy of professional development for the purpose of evaluating its effectiveness. Programmes are “specific sets of activities and materials which have their own identity and tend to be located in, or associated with, specific people or institutions” (p. 79), forms are defined at a more abstract level with only “typical, identifying features” (p. 80) and mechanisms are an “observable, replicable and irreducible component of an intervention designed to alter or redirect causal processes that regulate behaviour” (p. 81). Within these definitions, lesson study would be a form of professional development with the various mechanisms already listed in the elementary breakdown (see Page 57) and programmes of lesson study would be the instances of lesson study cycles which take place at various schools such as the ones I detail in Section 2.1. Often, one encounters evaluations of very tightly defined professional development programmes (very common in doctoral research, particularly in professional doctorates like this EdD), mapping aspects of the programme to observable outcomes. At the other end, meta-studies can generalise aspects of professional development forms or mechanisms by correlating these to measurable outcomes. From my perspective, a lesson study programme must be created such that it is rooted in the context but can be generalised in terms of the forms and mechanisms involved.

At my current school, like in many others across England, professional development is referred to as ‘Continuous Professional Development’ (CPD) and is conducted through a series of discrete activities on a regular afternoon or through multiple teacher training or INSET (In-
Service Training) days, at the start of a term. Actual teacher development is extremely constrained and at the mercy of educational trends, primarily dictated by Ofsted. Inspection reports make favourable characteristics and favourable practices plainly obvious, and these become the guiding force of development for most schools. Trust-level\(^{11}\) initiatives are also increasingly pushed by a closed circle of ‘educationalists’ (ex-practising teachers with executive leadership over various aspects of schools within the trust). Amidst the bureaucracy of this endeavour, the concept of professional development seems to have lost all sense of cohesion and ironically, actual educational value.

This approach to professional development is what Diamond (1991) refers to as competency-based teacher education (for example, based on an arbitrary generic list such as the Teacher Standards as set by the Department for Education (2011) or the Ofsted criteria of an outstanding school) which he considers less effective. That is, the existence of such criteria is not pointless, but their relation to professional development based solely on their existence and without reference to the school’s individual context or needs, is ineffective. By his polarisation, “personalistic teacher education”, of a more constructivist design and with the purpose of transforming the teacher’s perspective, is more in line with my interpretation of professional development. My own teacher training experience, through the Teach First programme, for example, followed a hybrid approach. Under the guidance of my two mentors, I underwent a series of pre-determined workshops and lectures, and my teaching was judged against the Teachers’ Standards. As well as a multitude of professional development forms and mechanisms, there exist even more specific configurations of these forms and mechanisms in terms of programmes. My aim is to adapt the lesson study form whilst also paying due consideration to the means through which teachers generally translate professional development knowledge into actions.

\(^{11}\) Academies in England operate under trusts, which can range from a few local schools to huge national organisations, with or without corporate/cross-organisational affiliations.
To that end, the general literature on professional development, which is largely focused on programmes and neither forms nor mechanisms, is often unhelpful: at times contradictory, overly dichotomised, and broadly correlational. At best, sketchy theoretical grounding is provided, and some guidelines and models can be found but the two are rarely linked and the latter are rarely practical. One common thread is the unanimous condemnation of the aforementioned ‘CPD practices’, as illustrated by this very familiar commentary from nearly three decades ago (Guskey & Huberman, 1995, p. vii):

* * * 

A good deal of what passes for “professional development” in schools is a joke – one that we’d laugh at if weren’t trying to keep from crying. It’s everything that a learning environment shouldn’t be: radically under resourced, brief, not sustained, designed for “one size fits all,” imposed rather than owned, lacking any intellectual coherence, treated as a special add-on event rather than as part of a natural process, and trapped in the constraints of the bureaucratic system we have come to call “school”. In short, it’s pedagogically naïve, a demeaning exercise that often leaves its participants more cynical and no more knowledgeable, skilled, or committed than before.

4.2. Theories of Professional Learning

To form a conceptual framework for professional development, it becomes necessary to adopt a theoretical framework which adequately captures how teachers internalise the knowledge and experiences afforded to them through engagement in professional development activities. Three useful theories of professional learning are explored here, to further complement the concepts of pedagogical content knowledge (Shulman, 1987), teacher dispositions (Peña Trapero & Pérez Gómez, 2017) and teacher self-efficacy (Bandura, 1997), explored in the previous chapter.

The Reflective Practitioner

In terms of models of learning, Kolb’s (1983) experiential learning cycle provides a simplistic cognitive process, whereby teachers seem to learn from ‘trial and error’:
Deemed “restrictive learning” (Evans et al., 2006), goals are construed and achieved with increasing success but the context and the goals themselves are not questioned. This could be considered a shallow type of professional learning, without the capacity for meta-reflection, or major, transformative change. Conversely, Argyris and Schön’s (1978) “double-loop learning”, which can even be extended to “triple-loop learning”, incorporate meta-reflective processes, and allows for deeper psychological changes at each stage of the Kolb cycle:

These feedback loops place a greater emphasis on the internal processes of the subject of change, but still imply that change can only occur through reflection on ‘poor performance’. Since learning is conceptualised as a cognitive processing of concrete experiences, it is at the mercy of confirmation bias, whereby individuals often conceptualise experiences based on their personal schemas and therefore find it more difficult to amend these schemas. Indeed, the process of abstraction requires considerable deliberation as it is likely the key to this entire model, and
therefore to professional learning itself. This process is also likely to be heavily socially
(mis)informed, as professionals do not operate in social vacuums.

In contrast with the “technical rationality” of the ‘learn-do-reflect’ models, we find Schön’s
(1990) ‘reflective practitioner’. The former view knowledge as independent of contexts and
therefore applicable to a range of contexts whereas the latter stipulates that contextually specific
solutions must be crafted. “Personal practical knowledge”, despite its dangers of confirmation
bias or “restrictive knowledge” (Philpott, 2014), roots professional knowledge in practical
experiences based on one’s current knowledge base. Thus, a “reflective practice-based model”
emphasises the classroom as the place of learning as opposed to “authoritative knowledge” which
is externally generated and merely prescribed. Despite contextualising professional learning, the
reflective practitioner model remains dependent on the (incorrect) assumption that reflection is a
“rational cognitive process”. Both models therefore lack “attention to the social aspects of
professional learning and the non-cognitive or rational aspects of learning” (Philpott, 2014, p.
12).

Knowledge and Practice

Cochran-Smith and Lytle (2001, as cited in Villegas-Reimers, 2003) offer a useful
categorisation to differentiate amongst the professional development programmes, forms and
mechanisms: knowledge-for-practice (academics generate formal knowledge for teachers to use in
their practice), knowledge-in-practice (“practical” teacher knowledge is perceived as key to
development, an amalgamation of Schön’s (1990) “knowledge-in-action” and his “knowledge-on-
action”) and knowledge-of-practice (non-divisionary in terms of formal and practical knowledge).
Most contemporary approaches perceive professional development as “knowledge-of-practice”,
however many theorisations of professional development merely conclude with a set of broad
guidelines (T. B. Corcoran, 1995; Guskey & Huberman, 1995; Villegas-Reimers, 2003) for what
constitutes effective professional development. Practical learning is often juxtaposed against
academic educational theory, which is proposed by Billett (1996) as a means of “disembedding”
professional learning. Philpott (2014) suggests these theories should be used as theoretical
frameworks to enable teachers to conceptualise their learning experiences, benefiting from exposure to multiple educational theories as multiple perspectives through which to draw abstractions from these concrete experiences. In short, knowledge-in-practice is formed tacitly, knowledge-of-practice is more deliberate, and knowledge-for-practice is more theorised but all three are required in various doses depending on the context.

Throughout the theories, models and programmes encountered, concepts of knowledge are debated. Amongst them, Shulman’s (1987) pedagogical content knowledge (PCK) is widely influential. Correlations in perceived changes in teachers’ PCK are often used to demonstrate the effectiveness of professional development programmes. Unfortunately, this is where the usefulness of the concept stops. It is not a properly theorised psychological construct in that we do not know exactly what it is (it is not an exhaustive list of all aspects of a teacher’s knowledge: an arbitrary boundary must be drawn as to what makes a piece of knowledge PCK and what does not), how it is acquired nor how it is translated into practice. Importantly, it is not necessarily supported by empirical research as Shulman himself theorised these aspects as ideals: “perhaps all we can generalise from empirical evidence is that skilled teachers reconfigure their subject knowledge in ways that take account of pupils, context, values, educational purposes, their own conception of the subject, assessment and any other thing that we think we should add” (Philpott, 2014, p. 19). A useful take on this, comes from framing it as “an ability to combine subject knowledge with pedagogical knowledge rather than as a body of knowledge” (Mason 1999, as cited in Philpott, 2014, p. 22). But again, this does not seem to benefit actual teachers nor to fit into my purpose of evaluating the means through which lesson study enables teacher development. When I reflect about how I teach, the knowledges I apply are:

• Organisational – knowing when my lessons are, when the exams are taking place and therefore understanding how to chunk the learning so that it fits within this timeframe as well as knowing where to obtain the correct resources to deliver these lessons.
• Curriculum and subject content – knowing what is required to be taught at which levels and being able to understand the actual concepts I teach, in and of themselves and relationally.

• Students, the school, and the community – knowing and being known to the students, both through reputation and personal relationships as well as knowing the structures and cultures within the school.

These knowledges are supplemented by my professional skills (self-evaluation, reflection, communication, etc), personal attributes (resilience, ambition, hardworking, passionate, etc) and enacted based on my physical/mental energy levels. Reducing these broad skills and knowledges to PCK could therefore potentially erase important aspects of teacher change.

A Social Cognitive Approach

This is where a theoretical paradigm like Social Cognitive Theory (SCT) can be applied, to capture the socio-psychological aspects of professional development. Through SCT, learning principally occurs through the observation of others and through selective, cognitive, motivational, and affective processes:

Selective processes relate to an individual’s assessment of situations they wish to attend to and the importance of these. The selected information is then coded and formed into mental models. This codification is guided by self-regulation and anticipatory scenarios (Bandura, 1993) both of which help humans undertake activities they wish to pursue, based on a perceived likelihood of success (self-efficacy). This perceived likelihood of success is appraised on the basis of the difficulty of the task one wishes to undertake, cognitive capacity and knowledge, appraisal of one’s previous successes and the physical and affective states of the individual. In this context, learning represents a continuous process of error elimination and refinement, where enactment and experience (combined with modelled behaviour and external feedback) provide an individual with information about how gathered knowledge and developing skills could/should be adapted and improved to guide further development. (Marschall, 2011, p. 5)
Social Learning Theory or Social Cognitive Theory is founded upon the principle that humans learn either “enactively” or vicariously. Enactive learning is from internalising the consequences of one’s actions and vicarious learning occurs from observing or listening to others and using others as reference points. Outcome expectations and self-efficacy, both learned through social interaction and personal experiences, then determine one’s learning and behaviour (Smylie, 1995). I first considered the possibility that the translational loss of momentum in the cycle of teacher change (i.e., new knowledge failing to actualise into sustained changes in teacher practice) could lie in the idea of self-efficacy, developed by Bandura (1997) within SCT. Going against the majority constructivist grain, this takes into consideration various behaviourist aspects of learning common in the field of psychology, including learning from the observation of others, the role of agency in allowing knowledge to affect behavioural change and the role of one’s environment and social context(s). Lesson study clearly affects teachers’ beliefs and deepens their subject, curriculum, and pedagogic knowledge (Tepylo & Moss, 2011). Yet, regardless of how powerful the learning experience might have been, teachers who take part in lesson study might still choose to cling to inherited teaching methods (most likely experienced by themselves as learners through so-called ‘traditional’ methods). This inhibits sustained impact on teaching and learning, limiting the benefits to a few, disjoint ‘moments of learning’.

Bandura’s concept of self-efficacy and Social Cognitive Theory have been successfully applied by Marschall & Watson (2019) in their attempt to bridge their theorised dichotomy between “acquisitionist or participationist” paradigms. Acquisitionist approaches involve concepts of teacher knowledge and cognitive development of the individual teacher whereas acquisitionist ones involve “the social, community, participatory aspects of professional learning”. Thus, they posit self-efficacy as the ‘missing link’: “Alison’s self-efficacy reflects knowledge in action, affective aspects and agency, acquired within a community of practice”. Marschall & Watson (2019, p. 4) apply Bandura’s reciprocal causation ‘B-P-E model’ to explain how teachers learn:
Here, behaviour (B), the individual (P) and the environment (E) “all operate as interacting determinants that influence one another bidirectionally” (Bandura, 1977, p. 6):

As well as integrating the social and cognitive aspects of learning, SCT incorporates affective aspects and provides a sophisticated conceptualisation of individual agency within a collective social context. Although agency is often treated as a property, capability or characteristic of the individual (Biesta, Priestley, & Robinson, 2015), SCT treats it as an emergent and evolving state, “achieved by individuals through the interplay of personal capacities and the resources, affordances and constraints of the environment by means of which individuals act” (Priestley, Biesta, & Robinson, 2015, p. 19). In other words, reciprocal causation provides opportunities for and simultaneously sets limits on individual self-direction for action (Bandura, 1997). This action, however, is guided by the individual’s agency and governed by their self-efficacy. (Marschall & Watson, 2019, p. 4)

Unlike previous models of teacher learning, SCT clearly factors in psychological and social dimensions as well as giving autonomy to the individual actor. Although this takes an essential first step towards resolving the issues in the broader professional development literature, this socio-cognitive link is not necessarily best explained through Social Cognitive Theory. Whilst self-efficacy provides a useful conceptualisation for the psychological leap required to envisage success on a self-devised course of action, it does not seem to capture the social elements involved in this internal deliberation process. That is not to say that Bandura was necessarily wrong but that the solution he proposed might be incomplete. Self-efficacy certainly plays a part in decision-making and the agency of the individual should not be ignored. However, the factors highlighted by other researchers can also be borne in mind. The beliefs, dispositions, and
cognitive dimensions (aspects of teacher knowledge) highlighted by Peña Trapero & Pérez Gómez (2017) include self-efficacy within the ‘disposition’ layer. Importantly, there are also external (social) elements involved in the processes through which an individual exercises their agency when undergoing professional development. Specifically, there are highly compelling objective constraints within which the teachers must form their courses of action. For example, as much as I would love to be able to teach algebra from first principles over a period of three months, I might need to deliver more topics to a class, and simply be unable to spend that long on this topic. There might also be ‘softer’ external social expectations, for example, most teachers introduce algebra over a period of two weeks by following set schemata. These factors ultimately come into play such that despite my very strong self-efficacious belief in my ability to deliver a rigorous introduction to algebra, I may decide to form an internal compromise by taking these external factors into consideration. This deliberation process is much more complex than the bi-directional B-P-E model implies and is key to the construction of teacher practice.

**A Socio-Cultural Approach**

Lave and Wenger (1991) differentiated themselves from social constructivist scholars, by highlighting the cultural aspects of learning, therefore considering learning from a socio-cultural lens. That is, they emphasise the culture of participation, relationships, and the shared purpose of activities. Within this, “communities of practice” are defined culturally, and entrants learn to assimilate as novices, developing their social capital and gaining influence over the community. These communities of practice are defined through “mutual engagement, joint enterprise and a shared repertoire” (Aubrey & Riley, 2019, p. 263). Professional learning is conceptualised as “situated learning” through “legitimate peripheral participation” in the community of practice wherein “the fostering of relationships and a focus on a shared purpose are seen as crucial” (p. 272). This approach is rooted in the more social elements of learning: a distinct turn from the ‘acquisitionist vs participationist’ or ‘constructivist vs behaviourist’ dichotomies.

Wenger (2000) went on to expand on the social elements of learning, through his concept of “social learning systems”. He posited that knowledge is displayed through “social competence” as
historically and socially defined by social communities. Thus, learning takes place when incongruences occur between social competence and our personal experiences (what Mynott (2017) referred to as “cognitive dissonance). This learning can take three forms as social competence and personal experiences interact with each other: engagement (collaborative action to define an actor’s personal powers in relation to their communities), imagination (perceptions of self and of communities) and alignment (abiding by previously set schemata or discussing differences in opinions). These “modes of belonging” (p. 227) analytically form different aspects of communities and personal identities as well as practically requiring different types of developmental activities. Wenger suggests that the different modes should be developed in combination, “balancing the limitations of one with the work of another” (p. 229), for instance “reflective periods that activate imagination or boundary interactions that require alignment with other practices around a shared goal could be used to counteract the possible narrowness of engagement” (p. 229). Wenger asserts that “communities of practice are the basic building blocks of a social learning system because they are the social ‘containers’ of the competences that make up such a system” (p. 229). In turn, everyone associates with various communities and these “multi-memberships” form our identities. The implications for professional learning would be to foster informal learning opportunities through these communities of practice and to consider the importance of professional relationships in the workplace.

Whilst SCT is claimed to conceptualise teacher learning as both cognitive and social (“affect and agency”) and communities of practice place social interaction and belonging at the heart of professional learning, they both fail to account for the process through which the teacher exercises their agential powers to determine their courses of action. As such, my interest is not entirely in what the teachers are ‘learning’ but the ways in which they are ‘developing’; the latter bearing a greater emphasis on actualised instances of learning, which can be empirically observed, and which I refer to as changes to ‘teacher practice’.
4.3. Unresolved Theoretical Requirements

In attempting to ascertain the full effects of taking part in lesson study, we find ourselves faced with a gap between theory and practice: why do teachers not teach the way theory dictates they should? Taking myself as the example: I have good subject and pedagogic knowledge (although admittedly, this does not necessarily translate to better teaching), partly through my undergraduate studies but mostly because I have been fortunate enough to receive high exposure to a range of teaching techniques, including through my engagements in lesson study. I am sometimes aware that my students are not developing deep conceptual understanding of mathematics through my predominantly traditional instructional style, yet despite my better judgement, I continue down the road most frequently travelled. This is what some researchers have reported on as the difference between espoused beliefs and enacted beliefs (Watson et al., 2016), or “espoused theories” vs “theories in use” (Argyris, 1993). Others have conceptualised this as two separate knowledges: “the knowledge we gather in our interactions with the world of ideas; and the knowledge we actually use to act effectively in a specific situation” (Peña Trapero & Pérez Gómez, 2017, p. 67). Further still, it is what Kahnemann (2011) described as a dual mind, or “fast thinking and slow thinking”. These constructs all come into effect with regards to ‘thinking’ before/during/after teaching: “teachers’ actions, especially in the context of implementing innovative approaches in their classroom, are consequences of a deliberative and reflexive process where teachers assess themselves, consider the social context, school and national policies and expectations” (Watson, 2017, p. 19).

If teachers are deliberate and purposeful in the crafting of their practice, how are their personal beliefs and dispositions balanced with external expectations? To what extent can lesson study aid in overcoming structural barriers to enable teachers to enact their espoused beliefs? There is of course, no unique best way of teaching and indeed, after teaching for some years, some of us will settle into methods which yield good enough exam results, inevitably leading us to ‘coast’ in some areas of our teaching. The ‘easier option’ of reproducing the familiar is certainly tempting:
There is a long-standing tradition which understands teaching as the transfer of key knowledge, skills and values. This is the reason why people who become teachers reproduce what their teachers did with them, adopting the same teaching habits. It could be said that there is, to some degree, a teaching protocol which is familiar to all of us and which persists not only through reincarnated habits but also because teachers blindly believe in its efficiency and effectiveness. (Peña Trapero & Pérez Gómez, 2017, p. 76)

Kennedy (2014) helpfully suggests focusing on the purpose of professional development. From this perspective, the purpose is to provide time and space for a teacher to make decisions or harbour thoughts which will enable them to evolve their practice, as they see fit. Therefore, I am not intent on exploring the ways in which cognitive leaps are made when experiencing professional development, but more about the means through which teachers make decisions to change their practice (or not) based on information (which could be self-generated through reflection) or experiences. This implies a distinct turn away from the psychological/behaviourist models explored in this chapter, towards a more sociological conceptualisation of teaching, professional development, and lesson study.

What we need as a profession, is to weave a development tool into our practice which will force us to regularly stop, reflect and innovate in discussion with our colleagues and without losing focus of our ultimate aim as teachers: the improved education of our students. There is much evidence that lesson study provides the framework for this process, but how, if at all, does it translate into improved teaching and learning outside of the research lessons and discussions, that is outside of the process itself?

The theoretical models explored in this chapter have provided many useful constructs, but they lack the ontological depth required to provide satisfactory explanations to the questions posed here. These incomplete theorisations are therefore now resolved through the application of a theoretical framework fit for the purpose of this research, in the form of critical realism.
PART III.
EMPIRICAL PLAN
5. Theoretical Framework

This chapter establishes critical realism as the ontological means through which the research purpose will now take form. By applying social morphogenesis as a theoretical framework to understand changes in teacher practice, professional development and lesson study are reconceptualised through a critical realist lens to finalise the research questions and to inform the subsequent methodology.

5.1. Critical Realism

Critical realism separates reality into the real, the actual and the empirical (Bhaskar, 1975). It is a meta-theoretical position which holds that an “objective world exists independently of people’s perceptions, language or imagination” (Edwards et al., 2014, p. 2):

A “distinction is made between the ‘empirical’ (what we perceive to be the case: human sensory experiences and perceptions), the ‘actual’ (the events that occur in space and time, which may be different to what we perceive to be the case), and the ‘real’ (the mechanisms and structures which generate the actual world, together with the empirical)” (p. 9)

Thus, the ‘real domain’ consists of structures and mechanisms which exist regardless of whether they are actualised or not. Even if they are actualised, these may or may not be experienced (empirically observable). Structures can be empirically recorded but mechanisms can only be inferred as they are theorised to activate the powers of the structures, from the real, to the actual and empirical domains.

Whilst Bhaskar originally formulated critical realism for natural scientific enquiry, its implications for the social sciences proved extensive. Building on Bhaskar’s philosophical foundations, realist social theorists were able to conceptualise social phenomena as interplays between the objective (structures) and the subjective (interpreted mechanisms).
These two axioms form the basis of my application of critical realism. The far-reaching practical and empirical consequences, as well as deep philosophical implications, are now explored through the application of some key critical realist concepts.

**Social Morphogenesis as a Theoretical Framework for Exploring Change**

Archer et al. (2016) pinned down the central tenets of critical realism as:

(i) ontological realism (shifting the attention away from “methods and forms of explanation”, towards the “kind of entities that actually exist in the social work and what they are like” after accepting that social realities exist independently of our investigations and articulations about them),

(ii) epistemic relativism (positioning of knowledge as “context-, concept-, and activity-dependent” and acknowledgement of the limitations and non-singularity of our representations),

(iii) judgemental rationality (the selection of particular accounts or theories over others), and

(iv) cautious ethical naturalism (the attempt to “reconnect facts and values” as opposed to a somewhat naïve quest for pure objectivity).

A rigorous alternative to the positivist-interpretivist dichotomy, this middle path circumvents a traditionalist obsession with research methods in favour of the real concern of the social researcher: the assemblage of an explanation of the social world, for the purpose of its betterment.

**The stratified or ‘depth ontology’ of critical realism, also supports my perspective of delineation between the way lesson study is described in the literature and my personal experiences.** The real mechanisms of lesson study, alongside their emergent properties, are laid out in Section 5.2. Conceptualising Teacher Change, the actualities of lesson study implementation are represented through Chapter 2. Context, and the empirical research ultimately aims to better define the former to better actualise its potential.

Archer (1995) defines social reality through the distinct features of structure, agency, and culture, and consequently social change through morphogenesis and morphostasis. She
conceptualises ‘culture’ as an objective phenomenon, distinguishing between the ontological status of culture and what people or groups make of it epistemologically. Unlike the previous definition explored in Section 2.3 (Ashkanasy et al., 2000), culture is therefore not a “community of shared meanings”; rather, there exists a cultural system (“replete with complementarities and contradictions”). There is also “socio-cultural interaction”, according to which groups draw and elaborate upon components of the cultural system in line with their (reflexively formed and informed) interests and projects.

With the former as distinctly objective and the latter as subjective, Archer reinforces interdependence between structure and agency. “At any given time antecedently existing structures constrain and enable agents, whose actions produce intended and unintended consequences, which reproduce (morphostasis) or transform (morphogenesis) these structures” (Brock et al., 2017, p. xvi). Morphogenesis (Archer, 2013) deals with “those processes which ‘tend to elaborate or change a system’s given form, structure, or state’ in preference to morphostatic processes ‘that tend to preserve or maintain a system’s form, organization, or state’” (Brock et al., 2017, p. 2). This approach is justified by a lack of logical chains of reasoning for social events, whereby actual events cannot be fully explained without “a real mechanism whose exercise, even in the open system that is the social order, is responsible for the intensification of social change” (Archer, 2013, p. 2). Structure-Agency-Culture (shortened to SAC for convenience, not to imply precedence or hierarchy amongst these notions) be visually represented through their morphogenetic cycles:
A morphogenetic cycle is made up of the temporally defined phases of conditioning ($t_1$-$t_2$) and interaction ($t_2$-$t_3$) and culminates in the morphogenesis/morphostasis ($t_3$-$t_4$) phase whereby either some or no change has occurred, and the next cycle is about to begin. In other words, it is necessary to acknowledge pre-existing structures/cultures as a precursor to the actualisation of change. For example, the focus on problem-solving in the 2017 secondary mathematics GCSE exams prompted many schools and teachers to re-think their schemes of work to better equip students with such skills. These efforts were thwarted by a lack of resources in schools where teachers could not be afforded the time to create or research such resources, where the teachers did not have sufficient subject knowledge to be able to do so or where there were insufficient
funds to invest in resources. In order to maintain their rank on school league tables or to meet their targets based on performance metrics, headteachers increased the pressure on teachers to produce grades (with limited additional support), and teachers mostly obliged through increased programmes of ‘cramming’ in the academic year leading up to the GCSE exams. Thus, the pre-existing macro-level structures of GCSE examinations and school league tables prompted heads of schools to enact their agential powers in a culture of exam-performance measures of success to either stimulate new exam preparation techniques in effective teaching teams or fail to do so in under-performing ones. The morphogenesis of teaching practice at the school-level would be evident in improved exam results and the stasis in the lack of improvement. Without the supporting structures to counter the unsustainable practice of ‘exam cramming’, it remains to be seen whether this reform resulted in any ‘increase in standard’ at the national level (the next set of international PISA tests will be a major governmental determinant of success).

The morphogenetic approach can thus be applied as a theoretical basis for understanding and explaining social change, meaning that it is not a method to be followed and in itself, does not explain anything. Like critical realism, it merely provides the overarching framework for the study of SAC, and their interrelations (which have been established with sound philosophical underpinnings) upon which a researcher may draw to explain social change. Indeed, some (Porpora, 2013) posit that this approach must be taken to render an “effective account of social change”. The meta-theoretical nature can also be explained with a particular “delineated” view of the “structure of social theory” as Social Ontology → Explanatory Programme → Practical Social Theory:

*All theories have a social ontology, whether implicit or explicit, which effectively defines the constituents of the social world. Therefore, the SO performs a role of conceptual regulation because it governs those concepts that are deemed admissible in description as in explanation—just as an atheist cannot attribute his well-being to divine providence. In itself, a social ontology explains nothing, although it may exclude certain explanations, cast in ‘improper’ terms. In itself, an SO tells no one how to go about explaining anything. For this*
an explanatory programme is needed. That is what the Morphogenetic Approach is; the methodological complement of Critical Realism, which is its meta-theoretical social ontology. [...] It is the investigator who contributes the material and problem to be explained and, if successful, produces what I have called a Practical Social Theory. The EP will have assisted in marshalling the SAC components to account for the ‘who’, ‘when’, ‘why’ and ‘what’ of change, but it is the PST that does the explaining. (Archer, 2013, p. 9)

“Double morphogenesis” is also accounted for, whereby “agents are themselves changed in the self-same process of generating social change” (Archer, 2013, p. 12), and is sought after in this application of lesson study.

Reflexivity and the Exercise of Agential Powers

Ultimately, agency is regarded as the key to change (through action) as morphogenesis only helps to explain the objective (structural and cultural) elements of social change. Agency is exercised through Archer’s (2003) three-stage model (Figure 5.2), tracing reflexive processes from discernment and deliberation (framed objectively by structural and cultural properties) to the subjective determination of practical projects. Forcing or artificially influencing such a process is very much contrary to the ethical and moral dispositions of an educator seeking to ‘liberate through education’. Therefore, my intention is to cultivate motivation and provide the freedom to enable the participating agents to exercise change.

As well as empirical tools to map objective outcomes to subjective changes, this three-stage model is a contextually rich framework for tracking change from the very conception of new ideas. Through a series of interviews, Archer (2007) has delved into the “internal conversations”
of participants through critical points in their lives, analysing the responses and using them to form her model of social mobility, as well as contributing to more generalised theories of reflexivity. This is a methodology I will be loosely basing my own empirical study on.

As defined by Archer (2007), reflexivity is the internal dialogue which, she daringly posits, might be the key to unlocking some of the mysteries of social sciences: “reflexivity involves a subject considering an object in relation to itself, bending that object back upon itself in a process which includes the self being able to consider itself as its own object” (loc. 951). Previously ignored by many others, she applies this simple concept to elucidate the choices of social agents under the influence of socio-cultural properties. Thus, what some might dismiss as ‘the voice inside one’s head’, is utilised as an analytical tool to trace the complex thought process which guides the participants into making the choices which ultimately determine their social mobility.

From my perspective, reflexivity could be the missing link between the thought processes of the teachers, and their (in)actions. Having initially hinged my research design on self-efficacy (Section 6.5), it was evident that the psychological concept of self-efficacy was not comprehensive enough to capture the complexities of the development processes involved in/around lesson study. If “the subjective powers of reflexivity mediate the role that objective structural and cultural powers play” (Archer, 2007, loc. 94), then this reflexive discourse will be the key to understanding why teachers do or do not wish to or are not capable of change, with self-efficacy (and personal beliefs) being “central or pervasive” to the “mechanisms of personal agency” Bandura (1995, p. 3).

A particular issue I found when analysing the self-efficacy of teachers, seemed to be a form of denial/misunderstanding. For example, some teachers would rate themselves very highly in terms of their ability to “deal with difficult students” but this very same teacher might demonstrate that they were incapable of dealing with specific difficult students on multiple occasions. My objective assessment of the teachers was at great odds with their own subjective evaluation of
their performance/ability and it was proving difficult for me to marry the two together to form a comprehensive overall picture (without simply calling them a liar). There is a predicate level of honesty required from the interviewees which they might find difficult to afford me in light of my very clear managerial powers over them: admitting to your boss that you do not feel you can control difficult students (in a school rife with ‘difficult students’) might feel like shooting yourself in the foot. Reflexivity would give me the framework I need to unpack the complexity of the teachers’ beliefs, dispositions, and self-efficacy in the context of the social and cultural structures within which they were operating, including those imposed by my own relative power over them due to our organisation’s hierarchy.

Causal Mechanisms

Ontological realism asserts that “powers may exist unexercised, and hence what has happened or been known to have happened, does not exhaust what could happen or has happened” (Sayer, 1992, p. 12). There exist causal potential mechanisms and these must be extracted to explain social change:

*The stability (or morphostasis) of the observed pattern of events* [in our case, the behaviour of teachers following participation in lesson study] *is predicated on the ongoing obviation of the causal powers of other entities. As such, if it were not for the existence of these deeper [ontological] levels, there would be no logical reason for the pattern of events observed to be as they are. This is not to suggest that deeper levels are inevitably required in a causal explanation, but the possibilities of causal mechanisms at deeper levels must be considered.*

(Edwards et al., 2014, p. 11)

Thus, by rejecting the overly simplistic action-causation half-truths, the realist researcher embarks on a quest for the identification of causal mechanisms. Since society is an open system, the identification of change in the social world needs to acknowledge the existence of broader social structures (Sayer, 1992). Double hermeneutics also factor heavily into this research since methods as well as social actors, are both being interpreted (Sayer, 1992). Thus, with a mission of explicating complex social systems, conceptualisations and abstractions become key to
unravelling real causal mechanisms. This may seem counter-intuitive for research which claims to be ‘grounded in practice’, however, throughout my search for solutions to my contextual problems, I have found the need to explain key concepts (lesson study, teacher change, etc.) at the ‘meta-level’ exigent. The usefulness of the existing literature has proven limited as its explanations have been found to steer clear of this level of depth, which admittedly requires the application of seemingly complex philosophical and sociological theory. By resting upon these well-established theories however, I now find myself able to draw upon the suitable constructs required to define these key concepts as well as the empirical framework to validate them.

**Methodological Implications**

Lesson study, and other interventionist reforms, affect events in ‘transfactual ways’, meaning their actual or empirical realisations take place when the entities associated with them exist due to “their ability to preclude the specific powers of other entities” (Edwards et al., 2014, p. 11). The “stability (or morphostasis) of the observed pattern of events is predicated on the ongoing obviation of the causal powers of other entities” (p. 11). Therefore, the realisation of the causal powers of lesson study is entirely dependent on the deeper conceptual levels of entities (social constructs with specific properties, e.g., the Maths department, the curriculum) in relation to these powers. In particular, the description of these relations between entities, whether they are empirically observed or not, becomes key to the research design aiming to fully elucidate a social construct. Specifically, this calls for the weaving of empirical descriptions with a theoretical analysis in an iterative manner which involves “a movement from consideration of the intransitive world of actual events, mechanisms, and structures to the transitive world of measures, descriptions, and theories” (p. 11). As well as providing genuine and accurate descriptions and analyses, this researcher is compelled to act upon these findings when and as they occur, hence finding a perfect alignment with principles of action research.

As I seek to transform teachers and their practice (here they represent the social actors or agents and their practice comprises of the interplay between socio-cultural contexts and subjective choices), critical realism provides the means to address the ways in which the accounts of social
actors (with regards to their experiences, dispositions and beliefs) are deeply embedded “within a wider complex of causal mechanisms” (Mills et al., 2010a, p. 2).

With a rejection of the two extremes of being either completely at the mercy of our situations or being completely powerful in our ability to affect our situations, the concept of the 'internal conversation', by which “agents reflexively deliberate upon the social circumstances that they confront” needs considerable unravelling.

Fundamentally, we cannot account for any outcome unless we understand the agent’s project in relation to her social context. And we cannot understand her project without entering into her reflexive deliberations about her personal concerns in conjunction with the objective social context that she confronts. (Archer, 2003, p. 131)

This approach reframed my understanding of ‘transforming teacher practice’: morphogenetic cycles track changes over periods, not discrete years. As a purveyor of ‘grassroots’ change, how did this fit into my values about the organic nature of emancipatory change? As an essential ‘middle person’ in my organisation, I am uniquely placed between the senior leadership and the majority group of teachers. Whilst limited, I am able to create and change structures on a small enough level that they do not clash directly the overall organisation’s modus operandi, but still support person-by-person change. This requires, first and foremost, the adoption of an emancipatory style of leadership: giving the teachers in my department the space (and time) to be able to reflect upon and modify their practice as they see fit. Capitalising on my “position-based agency” (Porpora, 2013), my stance as a middle leader can play a major role in advancing lesson study in an implicitly motivated fashion.

Methodologically, the use of critical realism in case study research emphasises “explicit theorizing, identification of causal processes, appropriate contextualisation, attention to temporal sequencing and interaction effects, and critical contextualization of actors’ accounts” (Mills et al., 2010a, p. 3). In particular, interviews should be “‘theory-driven’, [and] designed to explore, refine and test the character of proposed mechanisms and contexts and the ways they link to
Alongside case study, the action research paradigm is also implicitly favoured by critical realists (Layder, 1998). Lesson study is almost synonymous with action research and acknowledging the implications and limitations of the latter strengthens the overall research design.

In sync with the exploratory nature of case studies, Pawson and Tilley (1997) provide a practical break-down of ‘realist evaluation’ highlighting the importance of causal mechanisms, contexts and multiple outcomes, all approached with ontological depth and an appreciation of the personal choices required of participants to effectuate change at an organisational/structural level. When developing an account of possible mechanisms at play, the authors offer the option between ‘retroduction’ (using outcomes to explain mechanisms) as well as its inverse ‘retrodiction’ (using contextual mechanisms to explain outcomes) (Brönnimann, 2022). This critical realist analytical method enables an evaluation of the lesson study implementation strategy (as a particular configurational instance of a professional development programme), which can then be further abstracted to form more general models.

Drawing mostly from Archer, but also borrowing from other theorists such as Mouzelis (2008), Pawson & Tilley (1997) and Sayer (1992), I am now able to construct my own personal critical realist toolkit, which applied to my context, will enable me to take my research beyond a simple explanatory narrative and into the realm of theory generation.

5.2. Conceptualising Teacher Change

I began my social exploration of contextual challenges in Chapter 2 and now attempt to draw the parallels to Archer’s concepts of structure, agency, and culture as the three distinct ontological features of social reality. With structure and culture as distinctly objective and agency as subjective, Archer reinforces interdependence between structure and agency through the mediating powers of reflexivity. This provides a useful starting point to explore the aforementioned disconnect between teacher knowledge and teacher practice in a meaningful manner: exercising their beliefs and dispositions within their powers of reflexivity, teachers
design their classroom practice within the constraints of the structures they operate under.

Whilst the data will determine the final model of teacher change, this section begins to form the conceptualisations necessary to inform the methodological choices required to acquire the empirical evidence to begin with.

**Internalised Dispositional Structures**

The minutiae of the tangled web of activities as a result of the uncountable actions and projects which we are forever managing has led me to describe the climate of the Academy as ‘hectic’. In conjunction with this, the teachers and students are both ‘tough’ in their predominantly resilient approach to balancing continuous changes and demands. From the minute we enter the building until we leave, many teachers will choose to do things that are above and beyond our requirements, for our students. Ofsted and league tables are a major inconvenience we are accustomed to and hope to rise above; until then, those who choose to stay (as opposed to those who have no choice but to stay) in schools like the Academy despite the myriad of complications, mostly do so out of genuine desire to help our students, a noble demonstration of “internalized dispositional structures” (or Bourdieu’s habitus) (Mouzelis, 2008, p. 203).

An important guiding factor can be isolated within the reflexive processes which guide one’s agential choices, namely that of teachers’ dispositions, as the “internalized structures that present them with internal constraints and enablements” (Mouzelis, 2008, p. 212) (in response to Archer’s external structural constraints/enablements), with regards to the interactional dimensions affecting actions, as well as internal reflexive processes. If teacher change is recognised as a slow process of evolution, then the teachers’ internal deliberations over time lead to changes in their “knowledge-in-action” which eventually become embedded into their teaching practice, namely the “generally unconscious, automatic habits which intervene quickly and efficiently in the subsequent processes of perception, interpretation, decision making and action which will come about in the uncertain, new situations we face” (Peña Trapero & Pérez Gómez, 2017, p. 68). As part of this “gradual formation of new informed habits through a systematic process of progressive, constant incorporation of new ways of doing, perceiving, interpreting, taking
decisions and acting, all coherent with the new theories acquired”, “dispositions (emotions, attitudes, and values) appear as one of the most definitive components” (p. 68) in turning internal theories into actions and are now returned to as a key component of teacher change.

Personal dispositions are psychologically defined (American Psychological Association, 2023) based on their “degree of influence” on a person’s behaviour as: secondary, central or cardinal. “Secondary dispositions (or secondary traits), such as a tendency to keep a neat desk, are much more narrowly expressed and situation specific”, can be said to be empirically observable behaviours informing the subjectively defined “central dispositions (or central traits)”. Deeper, more ingrained, and harder to infer, are beliefs, which are referred to as “cardinal dispositions (or cardinal traits), such as a thirst for power, are so pervasive that they influence virtually every behavior of that person”. For example, a student who constantly minds their manners, can be described as possessing the secondary disposition of politeness by a distant observer, but this does not imply they display the central disposition of friendliness (perhaps their parents drilled the habits into them, and the student performs them purely instinctively). Friendliness implies a certain warmth of character and whether someone is ‘friendly’ or not, depends on how others perceive them. The student’s deep-seated beliefs about how to conduct oneself in social situations informs their cardinal disposition or personal conceptualisation of ‘friendliness’, which can be explored dialogically but is not as easily inferred. Thus, dispositions can be said to be internally possessed but socially formed and actualised, as such making them a socio-psychological construct.

For the purposes of this research, teacher dispositions are understood to be a set of individual traits to be inferred, in line with the second level “central dispositions”. Certain sets of empirically observable behaviours will be grouped together to form teacher dispositions which may or may not be congruent with changes to teacher practice. These dispositions will form part of the psychological make-up of an individual but will not necessarily actualise or lead to action. Ultimately, courses of action will still be reflexively deliberated, and this reflexive process will still be pursued as the means of enacting change. The purpose of denoting dispositions is therefore
to provide a helpful construct when analysing the qualitative data, forming generalisations, and informing the design of professional development programmes.

Figure 3.2. on Page 62 offers a psychological explanation for teacher change as a result of lesson study, which can re-interpreted sociologically, in line with the theoretical framework:

- Knowledge and skills are empirically observable markers of teacher change, actualised through teachers’ actions as they interact with students, colleagues and others within the school context.
- Emotions, attitudes, and values (forming Peña Trapero & Pérez Gómez’s definition of dispositions) cannot be directly observed and must instead be indirectly inferred. These may be verbalised by the teachers but can also be constituted based on sets of empirically observable behaviours.
- Self-efficacy is a specific internalised dispositional structure which may be particularly conducive to spurring changes to teacher practice (as explored in Section 4.2).
- Teacher beliefs are thus positioned as core aspects of a teacher’s identity which consciously or subconsciously inform their actions. These may only be rendered explicit through verbalisation as they are too abstract to infer from empirical events.

Similar aspects of teacher change can be observed in Figure 3.3 on Page 64, in addition to cultural aspects of change such as collegiality and structural aspects such as the curriculum. Thus, the subjective dimensions of teacher change are defined as pedagogic dispositions and beliefs and the objective elements of teacher change are defined as aspects of teacher practice such as resources, curricula, and collaborative enquiry. When teachers exercise their beliefs and dispositions, they are drawing upon them as part of their reflexive deliberations in relation to the construction of their practice, itself an observable set of routines and structures. Morphostasis is the reinforcement of such practice through repetition and morphogenesis is the alteration of some aspect. Morphogenesis is thus pursued following the teacher’s engagement with professional development activities.
Subjective dimensions are filtered through one’s previous experiences in relation to current emotive states and “constellations of concerns”. Thus, the constructs of teacher knowledge, dispositions, and self-efficacy, which were initially explored as key markers of lesson study’s effects on teaching (Section 3.2) can be interpreted as internalised belief systems (which, like personal dispositions, can be delineated based on their degree of influence). These are sets of principles which help people interpret the world and which help them inform their actions.

This interpretation is in line with multiple sociological paradigms, including Archer’s acknowledgement of identity (Archer, 2003, p. 139): “people with different identities will evaluate the same situations quite differently and their responses will vary accordingly”. Archer also refers to agents adopting “stances” or “basic orientations of subjects to society” (p. 343): “the ‘stance’ is ventured as a generative mechanism, at the personal level, with the tendential capacity to regulate relations between the person and her society. In short, they constitute the micro-macro link”, similarly to how Bourdieu posited “acquired dispositions of thought, behaviour, and taste” as the “link between social structures and social practice (or social action)” (Scott, 2015).

The term ‘internalised dispositional structures’ as coined by Mouzelis (2008), is an expansion of Bourdieu’s habitus which is used to explain “internalized social structures”. Harre’s differentiation of ‘personal and social identities’ (whereby “personal identity refers to ‘the basis of the individuality and uniqueness of existence of a single human being’, whereas social identity refers to ‘the type of role they (people, individuals) occupy or the job they do’” (p. 193)) and an attempt to re-emphasise ‘interaction’ or the “external conversation” among actors in relation to “intra-action”, the “internal conversation” of actors (p. 201). Here, “social causation as a unitary process entails the articulation via mediating mechanisms of intra- and interaction of the causal powers of agents (discernment, deliberation and dedication) and those of structures (internal and external constraints/enablements)” (p. 213).

Thus, this interactive dimension could be construed as a major mediating link between agency and structure (whose causal powers are distinct from each other). How do teachers resolve their
(possibly inter- and intra-conflicting) beliefs and dispositions within the structural constraints of their contexts to execute their perceived notions of ‘excellent teaching’? From experience, I know that this internal debate can be carried out multiple times within a single lesson to guide short-term actions (e.g., John is being too disruptive, I need to remove him from the lesson) and in greater depth to guide long-term projects (e.g., I need to speak to John and maybe his parents too, to understand why he was being so disruptive this lesson). Within this, teachers must navigate the politics of the “hierarchized social spaces” they occupy as each teacher possesses “different amounts of economics, political, social or symbolic capital” (Mouzelis, 2008, p. 212).

In exploring the reflexive sub-processes of discernment, deliberation and dedication, the hierarchical dimension and conflicting nature of overlapping structures, cultures cannot be neglected in their influence on the ultimate outcomes of actions, and therefore the causal powers of actors. To improve these outcomes, we should therefore be less concerned with attempts to correlate instances of lesson study with ‘instances of learning’, thereby making a concerted effort to rid ourselves of the obsession with outcome-based measures of success (such as performance-related pay or external exam pass rates) the education sector is crippled by. Instead, a reform visionary might have much more to learn from tracing how the learnings of lesson study are getting translated into actions, with the hope of being able to counter some of the constraints to further support the structures of lesson study or other forms of effective professional development.

**The Emergent Causal Properties of Lesson Study**

A critical realist approach enables us to accept the existence of ‘a thing called lesson study’. As this ‘thing’ interacts with the social world, it materialises in different ways. There is the theory of lesson study, what we may think of as ‘lesson study on paper’; then there is ‘lesson study in the real world’, constrained and potentially tainted by a myriad of agendas and realities. If we assume that the theory is unlikely to be realised in practice, only instances of interpretations of lesson study will therefore exist; there is no paragon, not even the Japanese case, as is often hailed,
because that is only one application in the specific context of the current Japanese educational, socio-economic, and political climate. On the other hand, lesson study is driven by a philosophy, therefore, despite any logistical or organisational shortcomings, it will continue to thrive and be practised by those who are inspired by some aspects of that philosophy, regardless of circumstances.

What can we observe from this disconnect between the theory and application? There is a distinct lack of synthesis amidst the current body of academic research and case study applications worldwide; the EdD presents the perfect platform to elucidate on my unique vantage point as lesson study participant–teacher–researcher to address this gap. As a practitioner of lesson study, I want to create a version that will work for my context and that will address the shortcomings I have experienced. In so doing, my intention is to address this research-practice gap pragmatically, and I have come to conceptualise this as the sociology of change, as opposed to the psychology of change. The difference is that former encapsulates the social, external elements which factor into teacher development such as groups or organisations and attempts to map these to pre-determined internal elements such as dispositions, knowledge, beliefs, and self-efficacy.

By positing lesson study as a method, I am acknowledging its output as knowledge as well as encompassing the range of tools which can be used to achieve this. Whilst this clarifies the lexicon for this thesis, it does not quite do justice to the social elements within the method. Like teaching itself, participation in lesson study is a socially defined act, it is not a mere passing of information but a series of complex interactions and relationships, defined and influenced by a myriad of external factors.

Contrary to the evaluations explored in Chapter 3, I wish to specifically reject the focus on “objects of learning”, desired “learning outcomes” or summative test scores, all of which are subject to uncountable factors and therefore potentially misleading. This enables me to be less concerned with tracing how the learnings of lesson study are getting directly translated into
actions. Instead, I propose to dive head-first into the dark and shallow pool that is the social reality of lesson study.

Like lesson study itself, my approach to theorisation has been cyclical, or a “continuous process which accompanies the research at all ‘stages’” (Layder, 1998, p. 4). This is in line with the modus operandi of professional doctorates, viewing social research as a middle ground between orthodox/established sociological theories and the collection and analysis of data with the ultimate purpose of developing “ever more powerful explanations of social phenomena” and to produce “ever more adequate knowledge” (p. 8).

The term ‘theory’ in this context is not meant in the academic sense of an established social science theory, but rather a set of ideas proposed (to be tested), to “make connections between situations not before related or research data not previously seen as fitting together” (Brewer, 2011, p. 3). The first act of theorisation I committed was in providing an explanation for lesson study itself, beginning with “studying the emergence, its advocates and purposes” for the purpose of explaining “how that method came to be constituted in the way we find it” (Carrigan, 2014, para. 15). Now I attempt to synthesise the constitution of lesson study, factoring in the sociological elements explored in this chapter.

In their attempt to get to the crux of the transformative potential of lesson study, Stepanek et al. (2006, p. 78) have underpinned the processes (what I referred to as “phases” in Table 5.1 on Page 113) by "Big Ideas and Habits of Mind" (see Figure 5.3 below). The authors’ powerful point here is that the core of lesson study lies behind the physical processes which can be observed; it is posited that the physical processes are merely the means to help participants grapple with “Big Ideas” and ultimately developing self-efficacy through collaborative research-based practice (“Habits of Mind”).
Secondly, considering lesson study as a method rather than the sum of its discrete elements enables its evaluation in a different way. A methodology, denoting a “set of rules and procedures to guide research and against which its claims can be evaluated” (Daly, 2011, p. 2), is fitting as a structure from which teacher knowledge can be generated as it is also built upon the premise of opening up the curriculum and empowerning teachers as agents of change. And whilst various types of teacher knowledge are enhanced from participation in lesson study (Lewis et al., 2003; Meyer & Wilkerson, 2011; Tepylo & Moss, 2011), lesson study goes beyond this to develop new pedagogic dispositions (Lewis, 2016; Peña Trapero & Pérez Gómez, 2017) or kizuki, paradigm shifts which cause one to see the world from a new perspective (Inoue, 2012, p. 17).

From a critical realist perspective, this can be thought of as the emergent causal properties of lesson study: “properties of the collective are not reducible to the properties of the parts that constitute it—that is, the sum is different to the parts—although knowing the parts and how they tend to associate helps develop a better understanding of emergence at the hierarchical level that takes our interest” (Edwards et al., 2014, p. 7). Whilst informed by literature and experience, these properties are clearly assumptions. Indeed, they are necessary assumptions for analytical purposes: what would we do with the concept of lesson study if we did not also develop a relational understanding of the overall entity to the social world?
Thus, building from the concrete elements and phases, I seek to establish the sociological aspects of lesson study which truly make it successful and propose that applying the lesson study methodology will develop elements of teaching (research-based teaching strategies and solutions developed through collaborative design) and will enable teachers to refine existing or to develop new pedagogic dispositions. Applying Anfara and Mertz’s framework (2006, p. xv), this expands on Stepanek et alia’s model to further formalise these “habits, ideas and processes” into my conceptualisation of lesson study for the purpose of professional development, starting with the most concrete aspects, onto the abstract:

<table>
<thead>
<tr>
<th>Component</th>
<th>Meaning</th>
<th>Application to lesson study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensation</td>
<td>Concrete experiences</td>
<td>Lesson study elements (pre-lesson discussions, producing a lesson plan, interviewing students, etc.)</td>
</tr>
<tr>
<td>Concept</td>
<td>Words associated to events to distinguish them</td>
<td>Lesson study phases of putting the team together, framing the research focus, the teaching and observation cycle, the research lesson and reflection and dissemination of findings</td>
</tr>
<tr>
<td>Construct</td>
<td>Clusters of concepts</td>
<td>A lesson study cycle involving all five phases, resulting in the development of aspects of teacher knowledge</td>
</tr>
<tr>
<td>Proposition12</td>
<td>Expression of relationships among several constructs</td>
<td>Applying the lesson study methodology develops elements of teaching (research-based teaching strategies and solutions developed through collaborative design) and enables teachers to refine existing or to develop new pedagogic dispositions</td>
</tr>
</tbody>
</table>

Table 5.1. The emergent causal properties of lesson study for professional development

The construct above establishes my definition of lesson study as a method which necessarily involves teachers teaching students in their social contexts, and engaging in collaborative planning, teaching, observation, and reflection. The subsequent proposition will now frame the empirical focus to enable this thesis to culminate in a “theory” (the final abstraction of the relationship amongst propositions) based on its findings.

12 the proposition is treated as a “newly invented” construct which must be clearly defined and explained
6. Methodology

Having established some key ontological underpinnings and contextual constraints, I now finalise the research questions, which in turn define the empirical approach as an action research case study. A critical realist conceptual framework summarises the research design paradigm, to ultimately inform the data collection and data analysis plans. Thus, this chapter provides the maps which will help me navigate the data to find the answers I seek.

6.1. Dual Research Questions

In keeping with the professional doctorate duality, this research pursues two distinct threads which interlink to make practical theorised claims about lesson study.

The practical research question of “How can lesson study be adapted to meet professional development needs?” aims to:

1. Inform a more generalised definition of lesson study (for all participants in lesson study),
2. Provide a template for the implementation of lesson study (for school-based leaders of lesson study), and
3. Evaluate this account of lesson study in terms of its contribution to the professional development of the participating teachers (for educational policymakers).

Complementing personal experiences with literature, I have also formulated a theoretical research question of “How do teachers adapt their practice as a result of professional development activities?” which can be broken down into sub-questions:

A. What are the transformational powers of lesson study?
B. How should we conduct impactful lesson study in varying contexts?
C. How do teachers enact change to their practice?

Like two faces of the same coin, A-C ask the more theoretical questions which accompany the practical concerns of 1-3. This dualistic approach satisfies the practitioner intent on improving the effectiveness of lesson study implementation, whilst also answering deeper questions about the
nature of teacher learning and development through more abstract theory-imbued models. These questions are thus separated by their target audience. These are essentially the same questions, formulated from different perspectives, to address the different “habitus” of the practitioner and the academic. In hybrid research projects such as these, this is an actualisation of hybridity.

The practical aims are also in line with McIntyre’s (2005, p. 370) research principles to reduce the gap between research and practice in schools:

(i) the research should generate valid new understandings of realities of classroom teaching and learning; (ii) these new understandings should provide a basis for clear indications to classroom teachers of how they might be able to improve their practice; (iii) the new understandings, and the suggestions for improvement to which they lead, should make sufficient sense to teachers to persuade them to take the suggestions seriously and so to engage in dialogue about them.

6.2. The Conceptual Framework

Unlike the general body of research on lesson study, I do not seek to simply embed the process, but to grow a more organic version around my contextual needs. If one wishes to activate the emergent causal properties of lesson study (the development of objective elements of teaching and the refinement of subjective pedagogic dispositions), then the teachers themselves must be central to these efforts. Thus, it is my intention to study the teachers in their participation in lesson study, in the context of their day-to-day teaching and with a particular eye on their perceptions of professional development.

The assumption built into the research questions is that lesson study possesses some inherent powers to generate change in teachers (emergent causal properties) and therefore the answer to its success lies in addressing contextual inhibitors and unlocking this potential.

This can be formalised as two key ‘presumed causal links’ established in Section 5.2 in applying critical realism to conceptualise teacher change:
(1) **Lesson study possesses emergent causal properties which are actualised through engagement with its mechanisms**

Applying the lesson study methodology develops elements of teaching (research-based teaching strategies and solutions developed through collaborative design) and enables teachers to refine existing, or to develop new, pedagogic dispositions.

(2) **Teachers exercise their agential powers to enact change to their teaching practices**

By engaging with professional development practices, teachers are actively making decisions about how and what to teach, within their contextual constraints (structures and cultures) and as informed by their existing beliefs and dispositions (which are not necessarily fixed).

These causal links will inform the procedures for each phase of the research, particularly the case study questions, propositions and anticipated outcomes (Sections 6.5 and 7.2.3).

My interpretation of a conceptual framework is one which links the research purpose and questions with the data collection, analysis, and presentation, as supported by the theoretical framework (Ravitch & Riggan, 2017). Applying the ontological stratification of social realism, I seek data at the empirical level to indicate (actual) causal mechanisms underpinning lesson study’s causal properties, as summarised in the figure below:

![Figure 6.1. The conceptual framework](image)

The empirical elements will contribute qualitative data which will be ‘retrodicted’ to infer causal mechanisms. For example, I will infer the teachers’ espoused beliefs and reflexive processes from their responses in interviews and this will be cross-referenced with their actual practice, which can be observed. These inferences will enable me to construct theoretical models
in response to my research questions, which are rooted in empirical evidence. These methods and processes are now explained in full detail.

6.3. An Action Research Case Study

The theoretical framework has begun the act of unravelling the sociological complexities of lesson study, the school environment and the processes through which teachers enact change to their practice. A methodology is now required which does not reduce these factors, rather incorporates these ‘messy realities’ to produce something which is helpful to both practitioners and academics.

This difficult task has called for a unique approach to research methodology, in line with what Law (2004) defines as “method assemblage”:

*an episteme with technologies added but that connotes the ad hoc contingency of a collage in its capacity to embrace a wide variety of incompatible components. It also has the virtue of connoting active and evolving practices rather than a passive and static structure. (p41)*

Rather than rigid sets of procedures seeking to produce set of neat and tidy summaries and generalisations:

*There is a need for tools that allow us to enact and depict the shape shifting implied in the interactions and interferences between different realities. There is need for assemblages that mediate and produce entities that cannot be refracted into words. There is need for procedures which re-entangle the social and the technical. There is need for the coherences (or the noncoherences) of allegory. There is a need for gathering. (p. 131)*

Whilst this does not eliminate the need for classical research methodologies, it encourages an approach to methods which is more open-minded and diverse, in acknowledgement of how much of the world is unknown and unknowable. To take a non-imperialist approach to method assemblage is to engage in the underlying politics as well as ontologies. As such, the methodologies and methods which follow in this chapter have all been collated for their potential to evidence the real and actual causal properties of lesson study, as per the conceptual framework.
With my continuous references to the context (the ‘woven narrative’) in my capacity as an insider-researcher as well as my intention to deeply embed specific notions of professional development, this work can be thought of as an immersive action research case study. It is immersed in its context(s), action-driven, open to adaptation following new information and a case study of one context, which can be used to inform others. The nature of the research is evaluative because it seeks to figure out a means (‘how’) of achieving its purpose. As well as evaluating the multiple instances of lesson study implementation as part of the action research aspect of the case study, lesson study is also evaluated more broadly, as a methodology for professional development.

Case Study

Many researchers have identified instances of lesson study success or failure in their specific contexts, arguably without much rigour and certainly without accounting for the uncountable variables involved in obtaining these ‘effects’. For example, Lewis and Perry (2017) sent teachers lesson study packs and tested the teachers and students before and after the lesson study. Through randomised controlled trials (RCTs), they found statistical evidence pertaining to the success of lesson study in improving students’ understanding of the specific mathematical topics tested. However, this completely fails to identify change outside of the lesson study cycle, which is precisely what lesson study purports to create. For example, having participated in a lesson study on teaching the area of rectangles to Year 5 students, this type of research would conclude that teachers who participated in the lesson study had a relatively better understanding of how to teach area compared to teachers who taught it through the traditional methods of consulting resources and/or using prior knowledge. This basic derivation does not acknowledge the multi-dimensionality of the effects of lesson study on teachers (and consequently students), whereas the case study format allows the full exploration of the latter. That is not to say that the researchers were incorrect in their use of RCTs, but that a quantitative study suited their research purpose (to decidedly correlate the use of lesson study with improved test scores) and absolutely does not suit mine.
Yin (2014) and Stake (1995) both explicate the purpose of evaluation for case studies, and my situation is particularly relevant to three out of Yin’s four criteria: (i) to explain the presumed causal links in real-life interventions that are too complex for survey or experimental strategies, (ii) to describe an intervention and the real-life context in which it occurred and (iii) to illustrate certain topics within an evaluation. I am interested in how lesson study’s emergent causal properties can be activated, against contextual constraints, for the specific purpose of professional development. The emergent causal properties are the “presumed causal links”. The descriptions and analyses of lesson study implementations meet the practical research objectives whilst the professional developmental merits of lesson study remain the key outcomes of focus.

A critical realist approach lends itself well to “small and deep” studies like mine: “its concern to explain social phenomena (events and experiences) in terms of the causal powers of particular social mechanisms and their complex interaction in specific contexts has important affinities with some traditions of case study research” (Mills et al., 2010a, p. 3). Furthermore, the choice to go with a single-case study was not entirely due to my limits on scope and feasibility (although this was a partial reason) but mostly because I wanted to create a rich and in-depth account. This case happens to be representative of many schools attempting to adopt not just lesson study, but other similar professional development programmes. Moreover, I would rather extend this work longitudinally than increase the number of cases at this stage. Multiple-case studies are present in the literature, but it is precisely because they lack depth that they are unable to contribute to the evaluative body of research on lesson study more significantly: getting hundreds of schools to implement lesson study does not explain anything about how lesson study achieves its purported outcomes.

Data will be obtained from a series of lesson study implementation cycles within one school involving the same set of teachers (as much as possible, given the high turnover of staff). Following Yin’s (2014, p. 29) five components of case study research design, I will be required to (1) formulate clear case study questions, broken down into (2) case study propositions to be answered directly by data collected to inform (3) the units of analysis, that is the teachers.
involved in lesson study. (4) A clear logical structure linking the data to the propositions, founded upon (5) criteria for interpreting the findings, will also form part of my case study methodology.

**Action Research**

To make lesson study successful in the school, the framework of action research enabled me to experiment with my implementation plan and adapt it in response to my data. In many ways, action research is the research methodological equivalent of lesson study: guided by the same action-reflection cycle, it empowers the researcher to reconceptualise design flaws as ‘learning points’. This has enabled me to take a refreshingly honest approach: I did not embark on this work as a fully formed, experienced social research expert, therefore make no claims to having done so. Every day I spent reflecting on my experiences and my data or reading about the experiences of others, I formed new ideas and new perspectives. This cumulative effect is brought to light in the final chapters, but with many mini paradigm-shifts along the way. I would also challenge any perspectives about the ‘sub-standard’ nature of action research as intellectualist and prejudiced against practitioner-researchers like myself. Our hybrid nature requires hybrid methods which should serve to enrich the existing doctoral research landscape; therefore, we should not be desisting from experimenting with and designing methods which could best serve our unique dual purposes.

Further to its suitability to my personal approach, Bassey (1999, p. 41) positions action research “as a subset of educational case study research: enquiry carried out in order to understand, evaluate and change”. Whilst evaluative and exploratory in the preliminary stages, this research intends to put forward an argument for the improvement of the current situation, in the form of models for implementation. It also resigns itself to the notion that any practical solution proposed can be infinitely ‘improved’ (in that improvements merely entail more streamlined contextual adaptations), therefore submitting to the cyclical nature of action research. Indeed, the cycle of lesson study itself can be categorised within action research, specifically intended to improving students’ learning outcomes. Altogether, action research provides a useful practical realisation of the critical realist ideal that it “is possible for social science to refine and
improve its knowledge of the real world over time” (Archer et al., 2016, para. 12). Action research for the purpose of generating theoretical knowledge is less developed compared to the purpose of generating practical knowledge; critical realism bridges this gap by providing a rigorous means of capturing and synthesising (theorising) the experiences of participants.

Most importantly, action research takes into account “the dialogical production of meaning within the research context” (Mills et al., 2010b, p. 323) in relation to the double hermeneutic of social science:

*The effect of the double hermeneutic means the research context is not “meaning neutral”; instead, the researcher [...] and the researched [...] are both active participants in the production of knowledge and the interpretation of meaning. Because of the historical and contingent production of meanings inherent in the multiple layers of the inquiry, the double hermeneutic engages both the researched and the researcher in a continuous interpretation of meanings within and through the discourses within which the research is embedded”* (p. 323)

The social researcher is already a part of their research under normal circumstances. In my situation, I am particularly entrenched in it, as I define and am defined by my context, and as I shape and am shaped by my actions in participating in lesson study. My use of the action research paradigm enables me “to examine the discursive effects of a given research context, within which discourse and meaning-making are produced by both the context and by the researcher’s interactions and interpretations of and with said context” (p. 324). Specifically, in ‘pausing’ in between phases of implementation of lesson study, I am able to explore the double hermeneutic with regards to my choice of methods and their micropolitical influences on the lesson study group. This enables a level of ‘meta-reflexivity’ which elevates the research beyond positivist ‘plan, do, evaluate’ templates of programme implementation, towards a more powerful analysis which encapsulates the sociological complexities of conceptualising teacher change.
The ‘phases’ within this work serve to delineate three major movements of the action research. The preliminary or pilot phase consists of the implementations of lesson study which took place at Midlands Secondary School. Being more exploratory in nature, these were able to reveal a plethora of contextual variations and issues, which took me many years to theorise for the purpose of creating a more rigorous research design. This first official phase of the research took place during the 2018-2019 academic year at the Academy, with the subsequent phase carried out the following academic year. This second phase also consisted of major revisions to the research design, after the data from Phase 1 had provided crucial learning points.

As per the action research rationale, the evaluation of the Phase 1 cycle revealed methodological inadequacies (although it did enable me to experiment with instruments and methods) and incongruences with the overall research context (my responsibilities, the make-up of the staff, the demands, and targets of the Academy, all were in a constant state of flux, which clouded the research with constant unpredictability). Had it not been for my action research stance, the difficulties I encountered would have forced me into a less ambitious research strategy, rather than enabling me to adapt to my environment as well as my increased understanding of the research matter. Indeed, action research is crucial in hectic environments like the Academy, arming the researcher with the tools to respond to constant contextual challenges.

The journey of my work best demonstrates how action research permeated its evolution. When submitted in March 2015, my doctorate proposal was intended to “evaluate the efficiency of lesson study for the purpose of mathematics curriculum development”. Whilst the current title and questions both retain some of these original research elements, they are both the result of a gradual evolution, as evident in the table below:

<table>
<thead>
<tr>
<th>Masters Research (August 2014)</th>
<th>What are the micro and macro benefits of engaging in Lesson Study?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral Proposal (March 2015)</td>
<td>(1) What are the medium to long-term benefits of engaging in Lesson Study?</td>
</tr>
<tr>
<td></td>
<td>(2) Is the long-term implementation of Lesson Study realistic and cost-efficient?</td>
</tr>
<tr>
<td></td>
<td>(3) What is the potential of Lesson Study within sustainable mathematics curriculum design and development?</td>
</tr>
</tbody>
</table>

*(table continues on next page)*
Writing 3
(December 2015)  How do variations in interpretations of Lesson Study affect its impact on teaching and learning?

Writing 4
(April 2016)  What are the effects of lesson study implementation on actors and organisations? Is lesson study another failed attempt at implementing meaningful change in the educational system?

Writing 5
(August 2016)  How does Lesson Study improve the teaching and learning of mathematics?

Writing 6
(October 2016)  (Building a theory of lesson study and developing an evaluative model for LS, with SCT as the answer to the theory-practice gap) Why do teachers not teach the way (theory dictates) they should?

Writing 7
(January 2017)  What are the after-effects of Lesson Study on teacher self-efficacy, in the medium to long term?

Registration Report
(February 2018)  What are the enablers and barriers to the development of pedagogic dispositions and self-efficacy when teachers participate in Lesson Study?

Phase 2 inception
(August 2019)  How can the philosophy of Lesson Study be extended to form the crux of a pro-active Professional Development programme?

Phase 2 conclusion
(August 2020)  (Lesson Study - a Realist Evaluation) How can Lesson Study be embedded into Professional Development practice?

<table>
<thead>
<tr>
<th>Table 6.1. The biography of the research question</th>
</tr>
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<tbody>
<tr>
<td>Each of these iterative developments of my work demonstrates the action research methodology in action and each one is a direct evolution of its predecessor, as well as giving rise to the two phases of the current form of this research, and inevitably birthing the next iteration. Significantly, the Registration Report can be conceptualised as the alpha version of this research, the improved but untested, ‘works on paper’ version. After much delay and attempts to increase rigour, I had moved away from my context; the methodology involving but a simple observatory case study was not appropriate as I was too entrenched in the empirical research and felt the need to react to the needs I observed. Therefore, this was a concerted effort to marry my purpose as a middle leader intent on bettering the mathematics education and attainment of the students at my school, and my purpose as a researcher seeking effective professional development solutions. Thus, Phase 1 of the research signified the beta version: the first iteration of this distinct action research cycle. Whilst the alpha test was methodologically conscious, the latter was context-focused, bringing the overall cycle into balance. Indeed, moving away from evaluating lesson study and focusing entirely on implementation enabled me to create a more suitable critical approach.</td>
</tr>
</tbody>
</table>

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evaluation. Under the umbrella of critical realism, I was able to synthesise these findings into various models which satisfied the complex hybrid of theoretical rigour and pragmatic applicability.

**Influence and Ethical Considerations**

Rather than fighting or evaluating my influence within this work, I have decided to fully embrace it. The team of teachers involved in this research is decidedly ‘my team’: I am their direct line manager and heavily involved in the evaluation and assessment of their practice. I conduct their performance management reviews, insofar as to recommend individuals for promotion and pay, as well as for capability procedures. The only way to deal with this unresolvable difference in power status between me and members of my team is to explicitly acknowledge it.

Secondly, there is very little student voice in the planning and post-lesson stages, therefore we are always constructing a very one-sided opinion of lesson study’s effectiveness as a teaching *and learning* tool. Moreover, if students are exposed to occasional one-off bursts of ‘proper teaching’ sandwiched into predominantly ‘normal teaching’, could this not pose a major disruption to the learning experience of students? Unfortunately, this is one aspect which I have been forced to neglect, due to limited scope, but which I hope I gave due consideration to (for example, through my explanation of a student-centric approach to teaching laid out in Phase 2).

As well as factually detailing my encounters with lesson study, I consider the reportage of these experiences as an important task of critical educational research in “bearing witness to negativity” (Apple et al., 2009) for they contribute an important yet frequently omitted view of the realities of teaching. The purpose of this type of critical pedagogy is to challenge assumptions considering the socio-economic inequality and power imbalances involved in education. Moreover, it must be part of the case for practitioner research that we report on the entirety of our practice (not just the nice parts) and that in questioning the appropriateness of the tools and principles we are handed, we seek to reform them to better suit their (true) purpose.
The individuals and schools involved have all been referred to through pseudonyms. For this unpublished work, this minimalistic anonymisation procedure was deemed adequate and would be reviewed should any aspect of the work be subsequently published more broadly. Consent was officially obtained from most, but not all lesson study members and assumptions about non-consenting members were carefully managed. Whilst I have attempted to keep the names of participants and locations out of this document, an internet search would reveal the names of the schools easily. Similarly, the participants might be recognisable from their job roles or titles, which were used as their anonymised handles. However, the decision to include these characteristics was considered a strict necessity of the research. If part of the aim of this research is to ‘report on the unreported’, then the reader must get a sense of the situation. The locations (Midlands and London) convey a historical background unique to those areas and essential to the identity of the schools, teachers, and students. Further details about the specific localities add strokes to the image of the community and finally, the culture and the climate of the school relay the finest details, in a way which attempts to stay true to the research’s purpose whilst respecting all of those it is reporting on. Importantly, the participants have been issued numbers as handles, to focus the reader on their professional characteristics and to avoid subconscious bias by keeping the teachers gender-less and race-less. My criterion for the inclusion of contextual details was concise: did they elucidate an aspect of the context which would ultimately serve the research purpose or objectives?

No doubt my personal prejudices and judgements permeate my words, more so than an average academic researcher, due to my insider perspective. I tried to reduce this as much as possible and wherever I have failed any participants, I can only apologise for this would have been entirely unintentional. Ideally, I would co-construct this doctorate, in harmony with the lesson study philosophy, with all the participants. Realistically however, I will only be articulating the opinions, perspectives, and beliefs of other teachers through my own voice, weaving together these personal accounts with academic literature and theories. To maintain the fidelity of all voices involved, I incorporated a more strategic reflexive framework for triangulated inquiry.
(Patton, 2015, p. 72), with three distinct vertices: the participants studied, myself as the qualitative enquirer and the audience receiving the study. I have attempted to and will continue to provide a semi-autobiographical thread during which I reveal my own opinions, perspectives and beliefs and elucidate my trains of thought to the reader, as I did verbally with the participants. Reciprocally, I have co-explored the opinions of participants, their perspectives and beliefs and allowed them full authorship over how they wish to share their voice with my audience.

The biggest threat to my research would have been multiple members of the lesson study group either no longer wishing to take part in the research (potentially due to time constraints or due to differences in opinions) or leaving the school. Whilst I did not wish to overstretch myself by trying to implement lesson study with more than one group, I did attempt to create additional lesson study groups which could serve as back-up options if the initial group were to dissolve. Due to my dependence on a few individuals, I also needed to exercise caution and be willing to compromise to ensure participants were comfortable with requests, considering their heavy existing workloads. Consent was sought in advance and in writing, ensuring all participants were briefed about the extent of their involvement within the project and once the research proposal was finalised, the Principal of the Academy was also briefed about the full nature of the research and its potential consequences, and a letter of approval obtained.

Being completely entrenched in the process of research, I had to take extreme care to avoid bias and/or control over participants. I participated in the lesson studies with my colleagues, thereby placing a degree of coercion through my role as their line manager and will ultimately be the final assessor and evaluator of this project, through my role as its sole author. These multiple roles were navigated carefully, and all participants were made explicitly aware of and given the options and opportunities to express themselves and/or remove themselves entirely from the project, without fear of explicit negative consequences.

Stake (1995, p. 103) highlights some key boundaries to define the role of the researcher and which I have adapted as follows:
(i) Participate fully in the activity of the case, in effect in the role of *kuishi* to coach members of the group about the process of lesson study itself and to model its components

(ii) Share my expertise on the subject, the research processes and lesson study itself in the true spirit of lesson study and teaching

(iii) Be unable to retain ultimate neutrality as an observer as I acknowledge to have personal/professional relationships with the subjects, whom I would consider friends, and must therefore factor this bias into my interpretations

(iv) Try to serve the needs of anticipated readers and attempt to professionally resolve my conflicts of interest

(v) Provide alternative interpretations by inviting all members of the lesson study group to contribute their own perspectives formally, in writing, as part of the final case study report as well as throughout intermediary interpretations

(vi) Attempt to curb my enthusiasm for I am already a strong advocate of lesson study

(vii) Form a narrative and attempt to tell a story in the end

Ultimately, a clear grain of ‘reporting the truth about lesson study’ was prioritised in this work, due to its initial limited publication range. This was balanced with ethical considerations and an understanding that digital copies of this work will be stored in the university databases therefore no opinions were stated, or observations made for any purpose other than to advance the research. Should I eventually extend upon or further publish aspects of this work, these would be reconsidered, and participants would be further informed.

6.4. Methods

This section establishes the techniques through which answers will be provided to the research question and sub-questions. The research is carried out in two distinct phases, with a case study question, plan and set of findings for Phase 1 informing the much more evolved Phase 2. This section only provides an overview of the methods chosen for this study, as each phase involved its own approach, as detailed in ‘Phase 1 Procedures’ and ‘Phase 2 Procedures’.
Based on the conceptualisation of teacher change from Section 5.2, Phase 1 answers the question “How does lesson study transform teacher practice?” by relying on a set of case study propositions (Yin, 2014):

1. Lesson study deepens teacher knowledge (subject, pedagogic and contextual)
2. Lesson study alters pedagogic dispositions
3. Lesson study develops teacher self-efficacy

The critical realist techniques of abduction and retroduction (Edwards et al., 2014), defined further down in this section, are used to form conjectures about the emergent causal powers of lesson study, based on these propositions.

This is then extensively evaluated to form the basis for Phase 2: **How can lesson study be adapted to meet the professional development needs of mathematics teachers in a tough school?**

- How can lesson study generate change in teaching practice?
  
  *Using the abductive techniques of retroduction and retrodiction to refine conjectures about the emergent causal powers of lesson study*

- How, if at all, can lesson study meet the developmental needs of teachers from a range of experiences and backgrounds?
  
  *Exploring the reflexive processes of teachers as they reflect on their experiences and backgrounds through interviews*

- How, if at all, can the practice of lesson study be integrated into a challenging under-resourced school serving a socio-economically deprived community?
  
  *Applying context-mechanism-outcome pattern configuration to identify instances of “what works for whom and when”*

**Timeline**

2018-2019 brought along its personal set of challenges for me (see Appendix B.2’s diary entry). Conducting academic research in this situation would not only have placed additional pressure on myself but also on the very team the research was supposed to be supporting, thereby
making professional development research a somewhat hypocritical act. There was no choice but to adapt the research design and delay actions and this led to the first learning point: **lesson study (and other such developmental activities) cannot be conducted when there are urgent non-negotiable pressures.** Every hour I spent sitting in an after-school meeting or ‘continuous professional development’ activity was an hour I could have spent planning work for cover teachers, mentoring new teachers, working with key students, or doing the countless other things I had to squeeze into my free time. With this in mind, the timeline had to be re-written so that fewer lesson studies would take place, without compromising on the final deadline.

<table>
<thead>
<tr>
<th>Term</th>
<th>Phase</th>
<th>Aims</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1 – Assessing the short-term effects of lesson study (on TSE)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EdD Years 3-4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spr2-2018</td>
<td>Registration</td>
<td>Prepare and submit the registration report</td>
</tr>
<tr>
<td>Sum1</td>
<td>Corrections</td>
<td>Implement corrections following assessment</td>
</tr>
<tr>
<td>2018-2019</td>
<td>Planning for the first LS</td>
<td></td>
</tr>
<tr>
<td>Aut1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Aut2</td>
<td>LS1</td>
<td>Conduct the first LS</td>
</tr>
<tr>
<td>Spr2</td>
<td>Assess changes in self-efficacy</td>
<td></td>
</tr>
<tr>
<td>Easter 2019</td>
<td>Write-up</td>
<td></td>
</tr>
<tr>
<td>Spr1</td>
<td>LS2</td>
<td>Conduct the second LS</td>
</tr>
<tr>
<td>Spr2</td>
<td>Assess changes in self-efficacy</td>
<td></td>
</tr>
<tr>
<td>Summer 2019</td>
<td>Write-up</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 2 – Final Study to assess the short/medium-term effects of lesson study on development</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EdD Year 5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-2020</td>
<td>LS3</td>
<td>Conduct the third LS</td>
</tr>
<tr>
<td>Aut2</td>
<td>Assess changes in self-efficacy</td>
<td></td>
</tr>
<tr>
<td>Christmas 2020</td>
<td>Write-up</td>
<td></td>
</tr>
<tr>
<td>Spr1</td>
<td>LS4</td>
<td>Conduct the fourth LS</td>
</tr>
<tr>
<td>Spr2</td>
<td>Assess changes in self-efficacy</td>
<td></td>
</tr>
<tr>
<td>Easter 2020</td>
<td>Final write-up of Phase 2 findings</td>
<td></td>
</tr>
</tbody>
</table>

*(table continues on next page)*
### Table 6.2. Draft doctorate timeline

Although other departments and nearby schools had shown an interest in taking part in the research, I was most qualified to make judgements on mathematics teaching and did not wish to overstretch myself by involving too many schools and/or departments. The validity of my study is therefore derived from the rich contextual data collected and well-triangulated analysis, rather than the number of participants or breadth of context.

**Data Collection and Analysis**

The diagram below demonstrates the means through which data will be collected and analysed to capture the developmental processes of teachers as they experience lesson study. As much of this case study revolves around context, the latter is incorporated at every level of the research, from a purpose-built lesson study implementation plan to narratively informed descriptions and context-mechanism-outcome configurations mapping contextual factors to specific outcomes. This is how the data will be followed from the initial (concrete) lesson studies to the generalised (abstracted) models of teacher professional development.

These methods remain consistent across the two phases, however the procedures used to implement them are necessarily adapted, as reviewed in Section 7.2. Methodology 2.0. Importantly, since lesson study itself constitutes a methodology, its implementation is also subject to procedural changes.

<table>
<thead>
<tr>
<th>Year</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum1-2</td>
<td>Literature Review</td>
<td>Update the Literature Review for the final dissertation</td>
</tr>
<tr>
<td>Summer 2020</td>
<td>Final write-up</td>
<td></td>
</tr>
<tr>
<td>2020-2021</td>
<td>Submission of dissertation</td>
<td>Christmas 2020 – initial first draft produced</td>
</tr>
<tr>
<td>Aut1-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson Study Implementation

As reviewed throughout Chapter 3, lesson study is a method that can take many forms and involve a range of mechanisms. As such, a particular type of lesson study programme will be designed, implemented, and evaluated, in each phase of the research. The design and evaluation aspects will also directly provide the answers to two of the practical research questions (a lesson study implementation template and its evaluation for the purpose of furthering the professional development of the participating teachers). These lesson studies will be experienced by the teachers through pre- and post-lesson meetings as well as the teaching and observation of lessons, both within and outside of the lesson study. Audio recordings, written notes and relevant lesson artifacts (e.g., copies of students’ work or resources used) will be collected, to serve as reference points for the descriptions and analyses to follow.

Interviews

In the critical realist search for mechanisms and causal powers, interviews provide an extremely important means of exploring the experiences of actors, as they navigate their ontologically layered (consisting of the empirical/experiential, actual and real domains) social realities. Since individuals are considered autonomous from structures, their experiences are
crucial in forming an accurate picture of the ‘real’ (social) world. By unpicking reflexive processes, one can begin to understand the inter-relational links between structures, cultures, and agency, and only the individual in question can explain this process.

The interviews which had been designed to glean the “internal conversations” of the participants as well as to get their input on the design of the professional development framework, were favoured above observations in Phase 2 as they gave insight into the teachers’ internalisations, which were considered as the first step towards transformative professional development, particularly suited for a critical realist study:

> Fundamentally, we cannot account for any outcome unless we understand the agent's project in relation to her social context. And we cannot understand her project without entering into her reflexive deliberations about her personal concerns in conjunction with the objective social context that she confronts. (Archer M. , 2003)

**Narrative Streak**

There is a considerable element of the personal imbued in the work of practitioner-researchers: this thesis is my story of lesson study. My voice is explicit in parts of the text such as the Context in Chapter 2 and the Diary Entries appended. Where the use of the first person is not explicit, it remains implicit: the ‘action’ in this action research project has been continuously guided by my own morals, purpose, and values, which I attempted to lay bare as often as possible. The ‘action’ was also non-stop and cannot be easily delineated from my day-to-day. Officially, I present my data as my research; unofficially, my entire practice constitutes my research. Both inextricably inform each other as the knowledge I develop permeates every aspect of my life: from my classroom and the leadership of my team to my personal relationships and reflections on world events.

Further to my narrative, that of two other members of staff was sought: the member of the Senior Leadership Team (SLT) managerially responsible for the maths department (my direct line manager) and the Principal (the SLT’s direct line manager). Both were included in the Context as
general commentary about the Academy and its current professional development provision. And whilst the views of my colleagues are being reported, they are being filtered through my perspective. A critically realist researcher views impartiality as insincere: it would be impossible to truly ‘do justice’ to the opinions, thoughts, and beliefs of these colleagues. Therefore, I abandon this fallacy and instead offer a more realistic alternative: to include these diverse perspectives in as much as they serve the aim of this research and to justify the decisions I have undertaken in my role as the ‘data qualifier’. Afterall, it is both the researcher’s prerogative and burden to differentiate between information and data, and to that end, to determine the integrity of the research.

Beyond a “talk about talk” and in true critical realist fashion, Sayer (1992, p. 266) suggests a “more self-aware form of talk about how we understand our world”, in light of our principal concern of elucidating the “causes of the social phenomena we study”. To deny the researcher the right to their narrative, is to rob social research of the personal psychologies which form the wider sociologies we wish to explore. These ‘personal psychologies’ are also explored more thoroughly in this phase, as the missing ingredient to getting one step closer to answering my research question.

Methodologically, some of my dilemmas and opportunities have been encapsulated by the literature on ‘insider research’, and rather pertinently for me, by my own EdD colleagues at Cambridge. Mine is akin to fellow EdD researcher, James Knowledge (Burnard et al., 2016, p. 96): “To me professional doctorate research is about changing thinking, about how we do things, thinking about who we are, who we want to become, how we can do things better and even how we can live more fulfilled lives”.

My analysis aims to draw causalities from interpreted observations, and it does so subjective to my unique perspective. There is therefore merit to narrative exposition in so much as we must accept the potential errors in our ontologies, theories, or chains of reasoning. Alone, a narrative would do very little in terms of answering my research questions. As an essential complement to
critical analyses, however, narratives acknowledge that “social phenomena have histories and geographies and their intrinsic meanings can be multiple and transient” (Sayer, 1992, p. 263).

**Abduction and Retroduction**

Informed by the general critical realist principles of social morphogenesis, the more practical tools of abduction and reduction are applied to make sense of the empirical data. The potential mechanisms of relevance were reduced to empirically realistic case study propositions prior to the each phase of data collection, and these are addressed abductively.

In the first instance of relaying the data, abduction is used to re-describe the observable everyday objects appraised (through the interview data, as well as observations) “in an abstracted and more general sense in order to describe the sequence of causation that gives rise to observed regularities in the pattern of events” (Edwards et al., 2014, p. 17). For example, an observation of teachers taking part in lesson study might generate a more generalised explanation such as ‘varying levels of participation due to over-work and varying levels of interest and self-efficacy’. These abductive explanations will draw upon relevant entities (such as the teachers, the department, the Academy, or lesson study itself) in relation to their potential mechanisms (such as power relations, teacher identities, beliefs, and pre-dispositions (including self-efficacy), communication, workload, and capacity). These abductive analyses are formed with the purpose of elucidating the effectiveness of professional development activities in hectic environments, focusing on features which either enhance or limit the capacities of teachers (e.g., lack of subject knowledge, lack of time, conflicting priorities).

Retroduction, which “seeks to ascertain what the world (i.e., the broader context) must be like in order for the mechanisms we observe to be as they are and not otherwise” (Edwards et al., 2014, p. 17), is used in the subsequent stage of data analysis. The deep and detailed retroductive analysis will involve the identification of patterns to identify (hidden) causal mechanisms, as well as the interpolation of different configurations of professional development activities as either limiting or enhancing to teacher practice. Retroduction acknowledges and incorporates cross-
operational mechanisms to “understand more about the relationship between the mechanisms we observed and the contexts in which it operates” (p. 18).

The abductive process begins in the findings in Chapter 7, by teasing out the concrete elements from the empirical data such that the retroductive discussion in Chapters 8 and 9 can draw together the conceptual and theoretical frameworks to conclude the overall thesis.

**Context-Mechanism-Outcome Configuration**

C-M-O configuration provides a means of conducting a retroductive analysis to form a clear evaluation of the lesson study implementation in context, and in so doing, to put forth possible explanations about the social realities of lesson study. This critically realist evaluation does not ask ‘does lesson study work?’ but “what works for whom in what circumstances and in what respects, and how?” (Pawson & Tilley, 2004, p. 2). It is therefore explanatory by nature.

Typically, the data analysis process erases the contextual details to form generalised abstractions. Contrary to this, my purpose is to create an analysis which makes use of these contextual details: this is what will make it a realist evaluation. Bringing together the wealth of sociological factors affecting these retroductively-informed outcomes, “the 'context-mechanism-outcome [pattern] configurations’ describe how different components of [the] programme need to be harmonised” (Pawson & Tilley, 2004, p. 10). “The best programmes are well-targeted programmes” (p. 8) which appreciate and work with and within the contexts, understanding its needs, nurturing desirable aspects, and diminishing the effects of negative ones. When faced with disparities between the programme processes/mechanisms and the contexts, one or the other must be adapted. “The logic utilises a ‘configurational’ approach to causality, in which outcomes are considered to follow from the alignment, within a case, of a specific combination of attributes” (p. 10). This type of logic and rationale is distinctly lacking in the highly contextualised environments of schools but demonstrates high potential for the design of successful strategies, programmes, and processes to deal with the wealth of diversity we encounter.
This technique can be applied to “sophisticated social interactions set amidst a complex social reality” (p. 6) and applies four lenses to explain and understand programmes on a granular level:

- mechanisms are identified as having some sort of causal properties on the programme participants,
- outcomes, based on observations, are taxonomised as positive or negative, short-term, or long-term and,
- contexts are defined in terms of their inhibiting or assisting powers to the mechanisms so that
- patterns can be formed from the contexts, mechanisms, and outcomes in the form of scenarios mapping the mechanisms and contexts to the outcomes.

Rather than a focus on measurable performance indicators (e.g., test results or teaching performance grading, both of which are fallacious), outcome patterns “allow for a more sensitive evaluation of complex programmes” (p. 9) and allow for a multitude of variations at every level of the analysis (“implementation variations, impact variations, socio-demographic sub-group variations, temporal outcome variations, personal attribute outcome variations, regional outcome variations, biological make-up variations and so on” (p. 9)). These patterns are of course subjectively formed and non-exhaustive, but they incorporate more aspects of the context.

Most importantly, these **C-M-O configurations are used to elaborate morphostatic and morphogenetic cycles of teacher change**, following their participation in lesson study and/or other professional development activities.

**6.5. Phase 1 Procedures**

This phase of the case study has been designed following Yin’s (2014, p. 29) five components of case study research design (in bold and underlined font).

**Case study question** (the core interest): How does lesson study transform teacher practice?
Case study propositions (in line with the research question and within the scope of the case study):

1. Lesson study deepens teacher knowledge (subject, pedagogic and contextual)
2. Lesson study alters pedagogic dispositions
3. Lesson study develops teacher self-efficacy

These propositions constitute the explanatory element of the case study as the anticipated outcomes of participation in lesson study, which might vary based on the levels of engagement lesson study, pre-existing beliefs, and dispositions, as well as various other contextual factors.

Figure 6.3. Anticipated outcomes of participation in lesson studies

The data will then be abducted and retroducted for markers indicating one of the above anticipated outcomes (the logical structure linking the data to the propositions). Increased self-efficacy and altered dispositions would be notable from interviews with the teachers but evidence of the modification of teaching methods would be sought from lesson observations or scrutiny of lesson resources (thus triangulating self-reported changes with observable ones). The data collection aims to capture the actions, comments and perspectives of teachers enriched with a running commentary to add the contextual backdrop (culture and climate of the department, the Academy, the trust, the local community, and the educational system). Each lesson study cycle consists of two to three research lessons and data will be collected on the teachers before, during and after their participation in the lesson studies, over the course of one academic year, with predicted outcomes outlined in Figure 6.3.
The **units of analysis** are the six teachers participating in the lesson study, numbered Teachers 1 to 6. Whilst a much smaller sample was required, I was concerned about the high staff turnover which would mean that maybe half of these teachers would no longer be present the following academic year for Phase 2 of the research. Six teachers were manageable and also enabled me to mitigate against this risk.

The **criteria for interpreting the findings** (Yin, 2014) was pre-empted through anticipated scenarios. I anticipated that one (in-depth) lesson study would produce noticeable shallow or improved outcomes but was unlikely to transform the teaching/learning experience overall. The following unsuccessful or semi-successful scenarios were considered likely to occur regardless of the outcomes observed within the timeline of the case study:

1. Teachers might fully regress into teaching the explored topics using (perhaps more familiar) methods known to be less effective.
2. Teachers will innovate for a short while following the lesson study but this will not be sustained.

Sustained lesson study over a longer period of time was predicted to be much more powerful but would be very difficult to maintain in the face of major contextual inhibitors. Teachers would need real buy-in to the idea to be convinced to dedicate their precious time to it. For example, Dudley’s (2014) was a “lighter” more pragmatic solution but a lack of depth might hinder the transformative potential, a process which could generate infinite capacity for improvement in teaching/learning:

![Diagram](image)

**Figure 6.4. Transformative potential of lesson study**

Considering this necessity for a lighter model and the foreseen disappointment, I was still ultimately searching for an even more well-adapted lesson study programme which would be
geared towards realising the transformative potential above. Most suited to this purpose, was the explanatory single-case study approach to answer the question “How does lesson study transform teaching?”, deep within the context of the establishment it was being implemented in. This research would be an empirical enquiry into a dynamic situation which is hard to distinguish from its environment/context, and as such, this broader question was considered more suitable for this phase.

As elaborated in the ‘Biography of the research question’ (Table 6.1), this phase of the research had the transformation of teacher practice pegged to the development of pedagogic dispositions and teacher self-efficacy, and was therefore answering the initial research question:

**What are the enablers and barriers to the development of pedagogic dispositions and self-efficacy when teachers participate in lesson study?**

The case study aimed to answer this question, in discussion with my colleagues, the lesson study participants. This involved data collection before, during and after participation in lesson study, mostly in the form of recorded meetings, lesson observations and semi-structured interviews. As much as possible, I wished to shift the researcher-participant dynamic in favour of the participants and co-construct the data analysis phase, to make for a less autocratic experience. This also enabled me to address some wider educational goal enablers, which lesson study demonstrated potential for:

<table>
<thead>
<tr>
<th>Education Goal Enabler</th>
<th>Discussion Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson study allows the continuous development of teaching</td>
<td>Do teachers become effective researchers of their practice through lesson study, hence developing their subject, pedagogic and contextual knowledge?</td>
</tr>
<tr>
<td>Lesson study facilitates the implementation of a dynamic curriculum</td>
<td>Does lesson study alter teachers’ pedagogic dispositions and/or enable them to change and adapt their teaching strategies to better meet the needs of their students?</td>
</tr>
<tr>
<td>Lesson study develops teachers as agents of change, beyond their classrooms</td>
<td>Does lesson study increase teacher self-efficacy enough to transcend contextual barriers to change?</td>
</tr>
</tbody>
</table>

**Table 6.3. Discussion points for research findings**
**Lesson Study Implementation Plan**

Having experienced the damaging effects of poorly implemented lesson study, as also evidenced by Bjuland and Mosvold (2015) and Mynott (2017), I created a Lesson Study Journal (see Appendix C.1) to facilitate the processes for new participants and to begin the process of explaining its benefits to colleagues, in order to get them to meaningfully engage with it. This was designed to give some structure to the lesson study implementation plan as well as providing another means of capturing the thoughts and notes of the participants.

**Interview Guide**

My intention was to interview colleagues at various points of the lesson study implementation, which constituted of scheduled meetings for pre- and post-lesson discussions, following the timeline in Table 6.2, using the Interview Guide in Appendix D.1. These interviews were a crucial means of complementing and interpreting my observations of the teachers’ practice. The semi-structured interviews were based on the concept of an ‘interview guide’ (Patton, 2015, p. 439), consisting of fewer than five questions each session and were designed to encourage participants to draw their answers from reflections on their experiences. The pre-lesson study interview was conducted as soon as the team was put together and the topic identified for the lesson study. The post-lesson study interview was scheduled as soon as possible after the research lesson had been taught. The first set of questions had been designed to glean the beliefs and self-efficacy of the participating teachers, as well as to gauge their interpretation of the lesson study process (which would have been already introduced to them during multiple whole-school training workshops on ‘Teaching Trios’). The remainder interview questions were designed to guide the teachers along the reflection process of their recent lesson study experiences.

**TSES Questionnaire**

The Teachers’ Sense of Efficacy Scale or TSES (Tschannen-Moran & Hoy, 2001) is a well-tested self-efficacy measurement tool consisting of 24 items (see Appendix D.2), assessed along a 9-point continuum with anchors at 1-Nothing, 3-Very Little, 5-Some Influence, 7-Quite A Bit, and 9-A Great Deal. The instructions directed the teachers to “Please respond to each of the
questions by considering the combination of your current ability, resources, and opportunity to do each of the following in your present position” and the questions are all broadly relevant to any teaching context, thereby making it easily implemented yet rigorous.

By focusing on TSE during the data collection and analysis, I created concrete points of reference for ‘teacher change’, determining the effect of lesson study in enhancing beliefs amongst teachers of their power to make a difference to their pupils’ learning. Furthermore, the four components of TSE can be associated with different aspects of lesson study:

<table>
<thead>
<tr>
<th>Self-efficacy component</th>
<th>Potential manifestation in lesson study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enactive mastery experience</td>
<td>Experiencing successful lesson study</td>
</tr>
<tr>
<td>Vicarious experience</td>
<td>Lesson observation</td>
</tr>
<tr>
<td>Verbal persuasion</td>
<td>Lesson study group discussions</td>
</tr>
<tr>
<td>Physiological &amp; affective states</td>
<td>Affirming lesson study group dynamics</td>
</tr>
</tbody>
</table>

Table 6.4. Manifestations of self-efficacy in lesson study

In evaluating ‘deep’ or ‘advanced’ lesson study in its more abstract sense, it was considered useful to examine its effects on self-efficacy and pedagogic disposition, as indicators of teacher transformation (see Figure 6.3), to create rich contextual accounts. Interwoven into my case study, I also continued to develop the concept of lesson study as a methodology and allowed this to both shape and be shaped by my implementations of lesson study.
PART IV.
FINDINGS
7. Action Research Case Study

This work began with my experiences of lesson study, and after much re-thinking, we now return to practice. Specifically, the five lesson studies experienced between 2013 and 2016 were explored in Chapter 2, then complemented with literature, theory, and contextual understanding to be refined into a methodology (Chapter 6) which laid out an epistemological plan for this action research case study. Conducted in two distinct phases over two academic years, from 2018 to 2020, empirical data was sought to support the presumed causal links:

- Lesson study possesses emergent causal properties which are actualised through engagement with its mechanisms
- Teachers exercise their agential powers to enact change to their teaching practices

In this chapter, the findings from Phase 1 are abducted to inform procedural changes to the methodology, including the implementation of lesson study, which is scaffolded by broader professional development practices in Phase 2, to better support the contextual needs identified. This adaptation brings us a step closer to the morphogenetic teacher development cycle (Figure 5.1), through which the emergent causal properties of lesson study (Table 5.1) can be actualised.

7.1. Phase 1

This phase was focused on mapping aspects of lesson study implementation which could be regarded as enablers as well as identifying key structural barriers, to pedagogic dispositions and self-efficacy, both of which were considered key drivers of change to teacher practice, which itself was ultimately sought as the outcome of participation in lesson study.

It took place over the 2018-2019 academic year and constituted of two lesson study cycles carried out by the same group of six teachers. The most notable outcome of this phase was the ‘teacher profiles’ (included in Appendix E and detailed in the next section) which were abducted from their interview responses and resulted in key methodological changes in the subsequent phase of action research.
7.1.1. The Teachers

The information below was obtained from interview data. It begins with the teachers to give a sense of the persons around whom the subsequent analysis is centred. Whilst I was responsible for hiring most of the teachers, it wasn’t until I interviewed them as part of this research that I truly appreciated the breadth of experiences (and possible reasons behind some of the difficulties some of them faced). To begin to get an idea of the diversity of the teachers in the sample, the following table provides a useful ‘go-to’ summary of some of their main characteristics:

<table>
<thead>
<tr>
<th>Teacher #1</th>
<th>Teacher #2</th>
<th>Teacher #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching experience</strong></td>
<td>13 years – 2rs FE college 4yrs prison 4yrs college 3yrs secondary (inc. 1yr as supply)</td>
<td>9 years – secondary</td>
</tr>
<tr>
<td><strong>Specialist subjects taught (not specialised)</strong></td>
<td>Adult education Business IT (Maths)</td>
<td>Maths</td>
</tr>
<tr>
<td><strong>Strengths</strong></td>
<td>Working with students with behavioural challenges Cross-curricular knowledge Well-established within the Academy</td>
<td>Strong curriculum knowledge Experienced teacher</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td>Non-specialist subject knowledge of maths</td>
<td>Some difficulty with challenging students/parents</td>
</tr>
<tr>
<td><strong>Current responsibilities</strong></td>
<td>Teacher of maths, business, and IT</td>
<td>Teacher of maths</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teacher #4</th>
<th>Teacher #5</th>
<th>Teacher #6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching experience</strong></td>
<td>3 years – College</td>
<td>10 years – Secondary</td>
</tr>
<tr>
<td><strong>Specialist subjects taught (not specialised)</strong></td>
<td>Maths Maths A-Level</td>
<td>Maths Physics A-Level</td>
</tr>
<tr>
<td><strong>Strengths</strong></td>
<td>Strong subject knowledge</td>
<td>Curriculum and exam knowledge</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td>KS3 teaching Exam preparation of Year 10-13</td>
<td>Is still settling into the new post Behaviour management</td>
</tr>
<tr>
<td><strong>Current responsibilities</strong></td>
<td>Teacher of maths</td>
<td>Maths KS4 coordinator</td>
</tr>
</tbody>
</table>

Table 7.1. Phase 1 teachers
Teacher #1 started off the year new to the teaching of mathematics, despite 15 years of experience teaching mostly vocational subjects (predominantly Business Studies) in various educational settings. They viewed education as the means to acquire qualifications, which they perceived as key to securing financial independence. Their main developmental points had been their subject knowledge of mathematics, but they faced deteriorating relationships with students due to an increased workload, both in terms of the quantity and the level of challenge of the content, amplified by multiple bouts of absence throughout the year. By the end of the academic year, they were not in a good position with regards to the perceived quality of their teaching of maths, as well as the achievement of their students in Business Studies. A versatile and broadly experienced teacher, #1 was certainly finding themselves over-stretched.

Teacher #2 joined the Academy in September 2018 and experienced their first lesson study then. They also perceived education as a gateway to a career and better life. Their start at the Academy was a relatively smoother one, whereby they mostly kept to themselves and got on with their teaching. They also made good contributions to the lesson study meetings, notably spurring the idea for the main lesson study. Their main developmental point had been communication with parents and managing challenging student behaviour, but their subject knowledge was also found erroneous during multiple lesson observations. By the end of the year, Teacher #2 had established themselves well, although they were unable to quite progress to the next step (successfully taking up additional departmental responsibility). Unlike Teacher #1, #2 was officially considered a ‘Maths specialist’ (they had been professionally trained as one), despite the questions raised about their subject knowledge.

Teacher #3 joined the Academy in September 2018, having taught in a Special Needs School for a year prior to this. They had emigrated from Greece having been unable to secure a full-time teaching post there, despite their degree in Mathematics. With strong subject knowledge and generally academically able, they demonstrated potential for teaching, but experienced major difficulties adjusting to the teaching workload and the school’s demands, from the start. Their
main developmental points had been behaviour management and they left the Academy (and the UK) at the end of the academic year.

Teacher #4 joined the Academy in September 2018, having taught A-Level Maths in a Further Education college the year before. As an NQT (Newly Qualified Teacher), they were teaching on a slightly decreased timetable, with additional support from the Early Careers Framework (The Department for Education, 2019) initiated by the government for newly qualified teachers (to reduce turnover during this key formative stage). They started the year off slightly overwhelmed but adjusted well and were considered a good teacher by the end of the academic year, ready to take on higher ability as well as A-Level classes. Their main developmental points had been to focus on exam preparation for Years 10-13 (a key skill to elevating one’s status in a school like the Academy) and to develop their teaching of younger students, both of which they were making good progress towards.

Teacher #5 joined the Academy in January 2019 as Key Stage 4 Maths Coordinator, having been teaching for 10 years. Despite this experience (which was not at a comparably challenging school), Teacher #5 did not adjust well to the Academy. Their curriculum knowledge was a strength, and they did contribute to the overall department. Their main development point was behaviour management, which they made some progress towards. They left the Academy at the end of the academic year to teach abroad.

Teacher #6 joined the Academy in September 2017, after having worked in a Pupil Referral Unit13 (PRU) for a year, and prior to that, a grammar school for 10 years. They were the most experienced teacher in the department, having been teaching for 20 years. As well as teaching Maths, they were also a Head of Year when they left their position at Christmas 2018, after four terms at the Academy, to start a new PRU. They returned to the Academy in April 2019 after the PRU was closed, just as a Teacher of Maths. They were content to resume in this capacity the

13 Pupil Referral Units are “educational settings providing alternative provision” for students who have been excluded from their mainstream school https://www.gov.uk/government/publications/alternative-provision
following year and were hoping to extend themselves to teach more A-Level the following academic year.

As I had anticipated, two of the six teachers left the Academy at the end of that academic year, meaning that if I had stuck to a lesson study group of three teachers, I could have lost most of the group after just one year.

Teacher Profiles

The Teacher Profiles (see Appendix E) for Phase 1 included:

- A very short co-written bio
- A summary of strengths and weaknesses based on lesson observations
- TSES averages, strengths, and weaknesses
- Interview responses
- Lesson observations
- Summaries of the teacher’s contributions to meetings and lessons
- An end-of-year update on the teacher’s position

Since I was particularly looking for the translation of knowledge, beliefs, and self-efficacy into action, I traced the learning journey for each teacher individually, according to their self-identified learning moments from the post-lesson study interviews. Within these profiles, the interviews were particularly enlightening in my dual capacity as a Team Leader and researcher of professional development/lesson study. They gave me an almost intimate look into the mindsets of the teachers with whom I worked closely and gave me true pause to consider their perspective (as opposed to imposing mine). These reflections did not just make me aware of their opinions, dispositions, and beliefs, they made me appreciate the importance of incorporating them into the process I was developing. The triangulation of lesson observations, TSES and interview responses produced some glaring incongruences for some teachers, which I was ultimately unable to resolve. This is explored more deeply in Section 7.1.3, following a brief description of the lesson studies conducted.
7.1.2. The Lesson Study

The two lesson studies took place in the spring and summer terms of the 2018-2019 academic year respectively, and both involved Year 7 students. The first lesson study was centred around ‘AO3 Equations’, meaning Assessment Objective 3 or the application of high-order skills to solving mathematical problems and was taught by Teacher #4 to their Year 7 class and then repeated by myself on my Year 7 class. It concluded with the need to provide adapted scaffolded resources when introducing difficult problems to students, to help them maximise their progress through the tasks as well as the introduction of these resources into the official scheme of work.

The second lesson study was a learning study on the topic of tessellations. The planning was highly efficient and resulted in a very good lesson including all the geometric knowledge required for students to access the main concepts and extending to the real-life applications of tessellations. Rather than observing one teacher teaching the lesson, every teacher of Year 7 delivered the lesson to their own class, such that the entire year group experienced it. Every teacher designed a small aspect of the lesson, including Teacher #6 who impressively used the Technology department’s laser cutting machines to make wooden cut-out shapes for students to tessellate. I also ran a competition across the year group for students to submit a poster on the topic and win an Amazon voucher, which created a great level of engagement with students following their participation in the lesson (as well as some nice displays for our corridor). The post-lesson discussion mostly focused on improvements to the resources, which were attached to the relevant section of the scheme of work for future use. Teacher #2 commented that they had had fun planning this lesson, and there was certainly more of a buzz around it, despite the lack of broader educational goal.

All pre- and post-lesson meetings were kept as short as possible as they took place after school. This meant that discussions were not as deep or philosophical but tightly focused on

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14 A ‘scheme of work’ is common English teacher parlance for the organisation of the school’s curriculum for a specific course of study, normally an adaptation of the prescribed national curriculum, in association with specific resources.
producing a lesson by a certain date, for a certain class/teacher. This was a very different experience to the in-depth studies from Chapter 2.

**Lesson Study Meetings**

These were heavily guided by myself, with a mind to strictly adhere to my time limits, as meetings were being conducted in teachers’ own time. Listening back to the audio files, I can hear the exasperation in my voice and the silence/lack of contribution of certain teachers make it apparent that they did not wish to participate and/or did not feel they could. It is hard to say what effect my ‘heavy hand’ had on the effects of the lesson study (in an ideal world, every suggestion/idea would have been fully debated and explored, but this would have led to extremely long meetings which some of the teachers would have no doubt resented), but it is evident throughout each meeting.

For example, during a particular hour-long pre-lesson study meeting involving six of the seven teachers, Teacher #2 successfully pitches an idea about a statistics project at the very start of the meeting, but as a group, we only circle back around to this at the very end, with Teacher #2 themselves tangentialising to an investigation about property prices (although it is possible that they were confusing the nature of a statistics data collection project). Teacher #5 makes a point (which they subsequently admit is irrelevant to the choice of topic for the lesson study) about questionnaire design being removed from the GCSE curriculum, Teacher #5 suggests the use of a step-by-step for problem-solving (which I refute and ardently oppose), Teacher #1 makes many comments about the inability of students to commit information to their long-term memory and to societal issues, Teacher #4 makes reference to the understanding of finance and “maths for banking” (dismissed by me as simple arithmetic for the most part). Consequently, only Teacher #2 and myself end up contributing to the decision to base the lesson study on a statistics project: the others create more diversions than contributions, indicating misalignments of the goal of the lesson study, which I was unwilling to debate at length (knowing that our time in meetings was severely limited). Without the luxury of endless hours of debate, the lesson planning meetings were kept snappy at the expense of the pursuit of deeper professional development opportunities.
Lesson Observations

Lesson observations proved to be an extremely time-consuming aspect of the data collection and were sometimes conducted under a dual purpose. For example, Teacher #3 had to be observed within my capacity as their line manager due to being on a ‘teacher improvement plan’ and we simply could not squeeze any more observations into their lessons around my teaching timetable (all lessons were observed during my free time, which was limited around my teaching load, lessons to be covered and meetings I had to attend). Observations were focused on the same three categories as the TSES questionnaire (efficacy for instructional strategies, student management and classroom management) for the purpose of triangulating the teachers’ self-assessed scores, as well as looking for markers of implementation of aspects of teaching and learning discussed during lesson study meetings. The former found a range of incongruences discussed within the general issued encountered with the TSES questionnaire and the latter found absolutely no indication that teachers were making any changes to their practice at all (not even in terms of the language they were using or when students’ books were consulted for evidence of general problem-solving tasks). That said, two disjoint lesson studies might not have been enough to create such changes and a few lesson observations might not have been enough to pick up on any changes in habit. Perhaps, these observations would have been more useful had they been pre-announced to enable the teacher to fully demonstrate their ability to plan an excellent lesson, but this would have of course unnecessarily contributed to their workload.

7.1.3. Findings

The nature of the findings from this phase were two-fold: methodological and action research outcomes. The former highlighted issues with the research design, and the latter resulted in a reworking of the lesson study implementation plan, both presented in Section 7.2.

Finding 1 – The TSES were incongruent with the observations

Despite having tested the TSES questionnaire on myself, the first issue I encountered was that the participants found the questions ambiguous. For example, question 6 “how well can you respond to difficult questions from your students?” was met with “well, does this mean how am I
able to do this given infinite time or how I actually end up doing this because I don’t have much
time in the lesson?” by Teacher #1. In the end, every participant had at least one question about
the questions themselves, indicating that they were not as well constructed as I had initially
assumed they were.

More importantly, after the very first collection of scores, obtained in January/February 2019,
I observed some glaring incongruences between the teachers’ practice and their self-rated traits.
For example, Teacher #2, who had rated themselves quite highly (7.75 on average) on all aspects
of Factor 3 (efficacy for student engagement) was having such difficulties engaging certain
individually challenging students, these students were having to be re-allocated to different
classes (after failed attempts to work with the teacher and the student/parents to repair the
relationship). This teacher was also observed to ignore ‘problem students’, resulting in these
students’ complete disengagement from maths lessons. These observations did of course not
negate their espoused beliefs or perception of themselves, but it did prove a real problem in
informing the profile of the teacher. In this case, it might have indicated Teacher #2’s inability to
reflect on their own practice or perhaps their denial about their own areas for improvement. Either
way, this was not going to help me on my quest of tracking the development of this teacher.

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Average (out of 9)</th>
<th>Total (%)</th>
<th>High-rated Traits</th>
<th>Low-rated Traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7.21</td>
<td>80%</td>
<td>(9) Q5, Q24</td>
<td>(6) Q4, Q6, Q15, Q16, Q18, Q21</td>
</tr>
<tr>
<td>1</td>
<td>6.00</td>
<td>67%</td>
<td>(7) Q2, Q5, Q6, Q12, Q13, Q14, Q16, Q21</td>
<td>(5) Q3, Q4, Q8, Q17, Q20, Q21, Q24</td>
</tr>
<tr>
<td>2</td>
<td>7.50</td>
<td>83%</td>
<td>(9) Q17</td>
<td>(6) Q4</td>
</tr>
<tr>
<td>3</td>
<td>4.75</td>
<td>53%</td>
<td>(7) Q1, Q7, Q11</td>
<td>(3) Q13, Q14, Q24</td>
</tr>
<tr>
<td>4</td>
<td>7.46</td>
<td>83%</td>
<td>(8) Q1, Q3, Q5, Q6, Q8, Q9, Q11, Q14, Q17, Q21, Q22, Q23, Q24</td>
<td>(5) Q20</td>
</tr>
<tr>
<td>5</td>
<td>6.04</td>
<td>67%</td>
<td>(7) Q2, Q3, Q5, Q6, Q17, Q18, Q19, Q22</td>
<td>(5) Q9, Q10, Q12, Q13, Q14, Q16, Q24</td>
</tr>
<tr>
<td>6</td>
<td>7.71</td>
<td>86%</td>
<td>(9) Q8, Q9, Q10, Q15, Q16</td>
<td>(6) Q19, Q23</td>
</tr>
</tbody>
</table>

Table 7.2. Summary of pre-LS1 TSES scores

Following my plan of summarising the TSES scores and comparing them at various points of
engagement with LS, the table above indicates the first such summary. The total score was a sum
of all the ratings as a percentage from the maximum possible total score (24 questions, each with a maximum score of 9). Following the trait incongruences observed, the ranking of the teachers according to their total scores and averages also identified Teacher #4 as an anomaly, prompting me to consider whether the TSES ‘high-scorers’ might in fact just be very confident teachers and/or not as deeply reflective as some of the other teachers. To that end, I began to question what exactly the TSES was contributing to my research purpose.

Finally, Tschannen-Moran and Hoy’s disregard of contextual positioning, in terms of teacher self-efficacy’s “relation to other beliefs, orientations, affective and physiological states” (Wyatt, 2016, p. 133), as originally noted by Bandura, was evident in the possible fluctuating nature of these self-assessments. I personally found my self-evaluated scores to vary depending on the type of day I had had, not just at work, but also at home. My original plan to evade this issue by complementing the use of the scale with other, richer contextual data, seemed inadequate if the scale contributed nothing of value at all to the data profiles.

These evaluative points were not simply ‘things to bear in mind’ about the data: they rendered this data completely useless for my purpose and spurred my decision to abandon the use of the TSES following just one round of data collection. I was driven by my purpose to create a more effective model of lesson study and to contribute to its evaluation as a method of professional development; if the TSES could not help me achieve these aims, it was not worth mine or the teachers’ precious time or attention.

**Finding 2 – The interview process did not invoke deep reflections**

The Pre-LS1 interviews revealed an interesting variation in the levels of sophistication in the teachers’ reflexive processes and therefore their opinions about what constituted the aims of teaching. In order, from Teacher 1 to Teacher 6, these are the first things the teachers said:

1: “The aim is to enable the student to succeed [by getting qualifications]”
2: “Education is a gateway, like a passport, to get into something (career/life)”
3: “The aim of teaching is to educate the students so that they can become independent adults, people with a critical way of thinking, and able to act on their own to be able to be supportive to other people, not just in an individualist way, to be productive members of society, not only from an economic point of view, but in a more social manner.”

4: “The general aim of teaching is to exemplify how students need to be as adults – societal rules, etc. But for me, the aim of teaching is to share my knowledge.”

5: “The aim of teaching is to help students understand the universe.”

6: “Teaching is to pass knowledge and to ensure young people develop not just cognitively but physically and emotionally as well, developing them into young adults to make correct decisions.”

The opinions ranged from perceiving teaching as a means to an end (getting a job), forming good citizens, passing knowledge to the next generation and intellectual enlightenment. Whilst this was not explored in more detail (in favour of focusing on practice-evaluation), these deep-seated beliefs would certainly influence pedagogical dispositions and therefore translations of these into teaching practice.

The post-lesson study interviews indicated little reflection on the pedagogical implications of the lesson study on teaching practices but rather general over-arching ‘take-aways’, e.g., “we should do more groupwork”. In hindsight, this is an unsurprising echo of the approach to general professional development. A typical INSET (In-Service Training) session involves someone making an exposition about an often seemingly random topic (perhaps whatever is trending in the ‘edusphere’ or with policymakers), teachers being asked to grapple with the idea in a superficial manner and concludes with teachers being asked “how will you apply this to your teaching?”.

Although I had explicitly referred to amendments in the schemes of work which would mean teachers would be repeating the project-style groupwork activities we had planned, no independent efforts were made by the teachers themselves to further adopt this disposition.
Simply put, they appeared to be not only ‘doing as they were told’ but also ‘saying what I wanted to hear’ so that I could leave them to do things as they saw fit, as usual.

**Finding 3 – The teachers were not engaging with lesson study fully**

Whilst the first two findings indicated changes were necessary to the data collection procedures, this one proved more pertinent to the main research purpose (of asking “How does lesson study transform teacher practice?”). This series of lesson study presented no evidence to support any of the anticipated outcomes of Figure 6.3 in full, nor the case study propositions regarding pedagogic dispositions or self-efficacy. However, the discussions and meetings certainly demonstrated a clarification of certain mathematical terms (e.g., the definition of a tessellation and sub-categorisation into regular and semi-regular tessellations discussed as the subject of LS2), which could be interpreted as “deepened teacher knowledge” (proposition 1). Participants voiced an inclinaiton to include more groupwork and open-ended tasks in their lessons, but this was not demonstrably carried out that same academic year. Thus, the ambitiously phrased “transformations to teacher practice” cannot be empirically substantiated. Indeed, in no instance was the lesson study identified as a major developmental point during the reflective interviews, although the teachers could all identify specific learning points for themselves throughout the academic year. They were not particularly prompted towards reflection on the lesson study, and this was a surprising indication that, in the medium/long run, the lesson study was not valued.

**7.1.4. Evaluation**

As well as facing certain social realities, I also encountered situations which pointed to issues within my methodology. The errors in the research design include too many participants in the lesson study, and therefore a mismatch in pedagogical dispositions, personal beliefs, or perceived priorities, which was harder to resolve through discussions. As mentioned, this was felt to be a necessity; I could not run the risk of losing the entire sample as I progressed into the second phase.
Often, the answers to the interview questions felt rehearsed or regurgitated, not necessarily with the purpose of deceiving the interviewer but perhaps because the teachers (myself included) had been trained to give ‘the right answers’ almost subconsciously. The research process itself is likely to have introduced confirmation bias and interference to the pattern matching process (by encouraging teachers to reflect on their practice/outcomes, I likely catalysed the effects of the lesson study). However, by weaving in the contextual factors and triangulating self-reported claims with observations, I had hoped to be able to reduce these instances.

The main outcome of the case study was the production of a Teacher Profile on each participant (see Appendix E). This was co-constructed by synthesising a range of multi-media data (written, audio-recorded, video-recorded and photographed) to form a cohesive picture of the development of each teacher in terms of their knowledge, beliefs, and self-efficacy, as detailed in Table 7.3. Alongside the initial purpose of the data collected, the third column summarises the issues encountered with this data.

<table>
<thead>
<tr>
<th>Data Collected</th>
<th>Purpose</th>
<th>Summary (issues)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSES Questionnaires</td>
<td>Providing a simple quantitative means of tracking the self-reported self-efficacy levels of participants</td>
<td>Uncorroborated self-reported scores (collection ceased following the first-round analysis)</td>
</tr>
<tr>
<td>Semi-structured teacher interviews</td>
<td>Mapping the changes in participants’ knowledge and beliefs</td>
<td>Teachers demonstrating a range of dispositions and beliefs (questions focusing on practice did not get to the depth of these)</td>
</tr>
<tr>
<td>Lesson Study Journals from each</td>
<td>Collecting participants’ written accounts and reflections from each lesson study</td>
<td>Many teachers chose not to fill these out and when they did, it was to record facts about the lesson decisions (Not designed to capture the personal reflections/opinions of teachers)</td>
</tr>
<tr>
<td>participating teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussions and fieldnotes from</td>
<td>Ensuring the capture of any potential critical moments in evaluating the overall effectiveness of LS</td>
<td>Often ‘deviating off-topic’ indicating teachers’ breadth of ideas/beliefs not easily conflated (heavily influenced and led by myself)</td>
</tr>
<tr>
<td>meetings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations of lessons</td>
<td>Triangulating interpretations of participants’ actions</td>
<td>Heavy focus on the main teacher executing the teaching plan/adapting to students’ needs (not enough time spent planning the lessons/anticipating student responses)</td>
</tr>
</tbody>
</table>

*(table continues on next page)*
Comparison of pre-lesson study and post-lesson study lesson plans, resources, and student work. Analysing the aftermath of participation in lesson study to identify actual changes in teaching strategies and a basis for comparisons between espoused and enacted beliefs. Teachers not transferring wider skills/pedagogic ‘gleanings’ across topics – no evidence of enacting espoused ‘changes’ (lack of post-lesson discussion to explore the transferability).

<table>
<thead>
<tr>
<th>Table 7.3. Issues with the data collection procedures of Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>This case study was successful in enacting the broader aims of the research: informing a comprehensive picture of how lesson study is being implemented, focusing on the effects on teaching (and learning), reporting on lesson study from the unique perspective of an insider teacher-researcher within a socio-economically deprived English urban secondary school and adding to existing commentary on the challenges of implementing educational change. To be able to make greater strides towards informing an overall evaluative model of lesson study, the next phase would need to address the general disparities encountered across the data, as per Table 7.3.</td>
</tr>
<tr>
<td>With regards to the iteration of the research question at the time of Phase 1 (‘What are the enablers and barriers to the development of pedagogic dispositions and self-efficacy when teachers participate in lesson study?’), time, space and energy seemed to be the major enablers/constraints, but this conclusion could have easily been reached without any actual research. This indicates the phrasing of the case study question itself was faulty: a refocus was required away from the identification of enablers and barriers and towards the implementation of possible solution models, to these overcome barriers without compromising the primary work of teachers.</td>
</tr>
<tr>
<td>Ultimately, an issue of shallow data was aggravated by an inadequate theoretical framework. Social Cognitive Theory’s concept of self-efficacy had not really informed the methodology as much as it was inserted to satisfy the doctoral requirements of a theoretical framework. Firstly, I was not getting a detailed picture of teachers’ dispositions and beliefs because these were more ingrained and not as easily discernible, and I was likely asking questions which did not delve deep enough into the historical and societal aspects of these sociological constructs. Secondly, the</td>
</tr>
</tbody>
</table>

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process of change to one’s practice was rooted in equally complex reflexive processes as well as both subjective and objective barriers, which also needed further elaboration. These will all be addressed in Section 7.2. Methodology 2.0

Reflection

Lesson study (and other such ‘add-on’ developmental activities) cannot be conducted when there are urgent non-negotiable pressures to be met. Lesson study is essential in a stable situation but can be cumbersome in a hectic environment. Denying the latter is denying the efforts of teachers in these environments and insinuating that there is more they could be doing. This sort of performance-driven or ‘not good enough’ attitude is perhaps the cause of much burnout, especially for teachers new to the profession. We do not expect our students to be able to sit the GCSE exams as soon as they enter secondary schools in Year 7 but in many schools, a newly graduated university student is expected to be able to handle the same responsibilities and tasks as a teacher who has been teaching decades. Without the appropriate support structures, this comes at a very unfair price to the teacher’s mental health and general well-being. This attitude is rather exploitative in a profession which claims to support and nurture young people.

Furthermore, lesson study is undemocratic by nature of its implementation. Every teacher has their own perception and ideas about pedagogic priorities, either developmental ones for themselves or for their students, based on their own deeply formed ideas about the purpose of teaching and the purpose of teaching mathematics, both of which are completely imbued in their personal experiences, including their own schooling, family, background, and reflexive processes. These differences cannot necessarily be resolved democratically so it takes one with authority (in this case lesson study leader) to impose their views as the dominant one which informs the lesson study. This also does not negate such contributions: a dominant voice does not necessarily need to be silenced, especially when the value of each contribution cannot be quantified. However, the more participants there are, the more likely it is for one of the voices to get lost in the mix. A group of 2-4 remains ideal for ensuring opinions are heard, however, this does not necessarily
result in a more democratic process, as I have exemplified in the Context. The agenda of the ‘leader’ of the lesson study group remains the decisive factor.

Using Yin’s (2014) “analytic techniques” specific to case study data, I had predicted the outcomes as:

1. Teachers will develop their subject knowledge and innovate their teaching of the unit, strand or skill at the heart of the lesson study research question (e.g., algebra, problem-solving through the use of diagrams or finding the area of rectangles). This will be apparent in their use of language pertaining to the topic and in the adaptation of their resources when teaching relevant topics.

2. Teachers’ self-efficacy will increase as a result of taking part in lesson study. This will be evidenced with the TSES as well as the Teaching Profiles.

3. Teachers will modify their teaching strategies for topics perceived to be related to the lesson study focus but unrelated topics will be taught as they previously were. This will be explored in the observations and evidenced through post-lesson study teaching materials.

However, these were predicated on major assumptions about lesson study, the teachers, and their development: we assumed it definitely had an observable impact on teaching practice or indeed that an external process is able to spur such a fundamental change or further indeed, that such a change in teaching practice is possible to begin with. Freedom from exam criteria was assumed to enable teachers to ponder the intrinsic purpose of their subject, but do teachers want to do this?

Specifically, each of my initial questions (in italics) was loaded with assumptions:

- Do teachers become effective researchers of their practice through lesson study, hence developing their subject, pedagogic and contextual knowledge? Do teachers consider it necessary to develop these different aspects of their knowledge and do they appreciate the research element this ought to entail?
• Does lesson study alter teachers’ pedagogic dispositions and/or enable them to change and adapt their teaching strategies to better meet the needs of their students? Again, do teachers consider it necessary to change any aspects of their teaching practice? Even if they know parts of their practice need to be adapted/changed, do they wish to undertake the processes required to practically implement such changes?

• Does lesson study increase teacher self-efficacy enough to transcend organisational barriers to change? Is self-efficacy the only requirement for change? Do teachers wish to “go against the grain” or would they consider the societal consequences not worth it?

In general, there was an assumption of elasticity of teacher development. This must actually vary from teacher to teacher and tie into various other factors including beliefs and dispositions, as well as self-efficacy. In particular, in an area where the students experience disadvantage due to their socioeconomic status, will the teachers experience this too (both personally and organisationally)? Unless genuinely motivated to tackle educational disadvantage, are the teachers in disadvantaged areas under-qualified (in comparison to state schools in more middle-class areas) or over-ambitious (big fish in small ponds who will climb the ranks quickly, not necessarily by nurturing their practice but possibly mostly through ‘career-enhancing’ moves)? The beliefs, desires, and ambitions of the teachers, in the context of their own personal problems, would certainly affect such an elasticity.

**Phase 2 Requirements**

If the upgrade report and viva were the Alpha Test, then this phase 1 was the Beta Test, and each iteration henceforth would be an improvement on the previous one, in true action research evolutionary fashion. Indeed, each of the problems highlighted above is addressed in the Phase 2 research design (Section 7.2. Methodology 2.0) and the key application of a critical realist framework can be seen to enable the exploration of these underlying concepts and issues in a more satisfactory manner. Despite the issues, there were some findings to take forward to Phase 2. Thus, this phase concludes with key learning points regarding both the context and the
methodology adopted, which will rightfully form the starting point for the design of the subsequent phase.

There is a difficult balance to strike between scope and ambition within (professional) doctoral research. After five years of this endeavour, I have found that introspection takes precedence over academic guidelines. Stepping back and looking back, at the end of Phase 1, was a powerful experience and enabled me to build on the wealth of knowledge and experience I had gathered to take a confident step forward. In this moment of clarity, I knew that my guiding force was the development of the teachers in my team, with the same self-assurance ‘doing what’s best for my students’ guides much of my day-to-day at school. In academic parlance, this could be considered a distinct re-prioritisation of ontology over epistemology.

To be clear, the first phase has established that lesson study cannot meet the professional development needs of the mathematics teachers at the Academy. Without risking further dilution of the process, no adaption of lesson study is offered. Instead, the question of the professional development needs is given more consideration in the subsequent phase of the research.

With reinforced conviction, the research naturally evolved towards considering lesson study within the overall professional development spectrum of the maths teachers at the Academy. If the defining purpose of lesson study is to provide teachers the space to collaboratively explore and innovate, then the intended outcome is the development of these teachers in terms of strengthened resolve to put co-validated pedagogic dispositions into practice. Whether these are perceived to be successful or not is almost irrelevant: the reflective and reflexive processes serve to cultivate the self-efficacy of the teachers and in so doing, ultimately make them better teachers as per whatever dimensions the teachers choose to define ‘better’ teaching. Measurements of self-efficacy and demonstrations of ‘better teacher-ship’ in lessons, were no longer sought. Instead, the focus shifted entirely onto the improvement process itself.

This concept of ‘spaces’ required for lesson study it turns out, were much more contested and complex than previously assumed, thereby presenting an ideal springboard for
further exploratory research. Such a space is already occupied by the teachers’ plethora of subjective concerns as well as the objective structural constraints they find themselves within. These are complex, omnipresent, and ever evolving, forming a unique base for the knowledge, dispositions and beliefs generated by lesson study to attach themselves onto. An understanding of these factors would therefore make for a ‘better’ model of lesson study, or even more broadly, for a better understanding of teacher professional development.

The methods and framework for this Phase 2 research needed to enable the evaluation of this model of lesson study, with the latter required to be malleable to the unique contexts of the heterogenous teachers. This model might consequently not be directly applicable to a different context; there might be more to learn from the design process itself than the presented (unfinalised) product. Altogether, the next phase applies a different lens to the same initial research goal, broadening the conceptual umbrella but retaining the focus on the practical applications of lesson study to the development of teachers and of their teaching.
7.2. Methodology 2.0

As a result of the findings from Phase 1, two aspects of the research needed re-designing: the methodological tools used to capture empirical data relevant to the research purpose/questions and the lesson study implementation plan to maximise professional development opportunities for teachers. In true action research fashion, the essence and goal of the research were retained, and every other aspect of the research was allowed to evolve.

7.2.1. Enabling Positive Lesson Study Outcomes

In ‘Figure 6.3. Anticipated outcomes of participation in lesson studies’, I had explored the potential outcomes of lesson study and my case study was designed to capture the barriers and enablers to the ‘potential realisations’ of the causal powers of lesson study. As I was about to design my second phase of action research, another practitioner-researcher published a powerful conceptualisation of lesson study outcomes in the form of an improved model of his previous work (see Figure 3.4. Mynott’s (2017) outcomes of lesson study). Mynott (2019) posited that ‘realisations’ would lead to different configurations and outcomes of lesson study, which he pinned down specifically to “dissonance” (expanding on what Dudley (2013) had referred to as “moments of learning”):

![Diagram](image)

Figure 7.1. Mynott’s (2019) model of potential lesson study outcomes

In so doing, he began to define a taxonomy of lesson study outcomes in terms of the learning capacity of the participating teachers, which he astutely pinned down to the presence of “dissonance”, allowing for a more nuanced discussion of the group dynamics and collaborative
development processes. For example, a lesson study group could be perfectly civil, organised and produce just the right documents and resources. However, if the discussions did not create any cognitive dissonance, then ‘true learning’ did not occur for this group did not deeply engage with the ulterior motives of lesson study: going through the motions of lesson study without engaging with the deeper mechanisms does not make for a good or successful lesson study.

This dissonance could also metamorphose internally as an incongruence between practice and beliefs, as shown by Peña Trapero & Pérez Gómez (2017, p. 71) in their case study of a teacher whose lesson study experience “bolstered or supplemented the dispositions, rather than transforming them, leading to practice which is much more in line with a series of beliefs which, in this case, are in a process of continual (re)-construction”.

Mynott further positioned these four outcomes within the four dimensions of time, collaboration, expertise and facilitation (see Figure 7.2 below), with effects measured as “potential learning opportunities” arising due to the aforementioned dissonance, which may or may not be actualised into changes in practice or structures (e.g., organisational changes or changes to schemes of work):

![Figure 7.2. Mynott’s (2019) expansion of Outcome 3 (as per his model of potential lesson study outcomes)](image-url)
Parallel to Mynott’s model of outcomes and based on the interactions between the critical realist concepts of ‘the empirical’, ‘the actual’ and ‘the real’, Elger (2010a) also produces a useful categorisation of outcomes as:

- Causal powers exist unexercised (none of the potential is triggered – Outcomes 1 or 2 from Figure 7.1)
- Causal powers are exercised unactualised (the potential is disrupted so it is only exercised in modified form – Outcome 3)
- Causal powers are actualised unperceived (the potential is realised but is not empirically observed – Outcome 4 takes place but is not recorded by the researcher) and of course,
- Causal powers actualised (the potential is realised and observed – a recorded case of Outcome 4 by the researcher).

Elger’s categorisation therefore lends itself to an axiomatic principle: (from a critical realist perspective) regardless of whether they are actualised or perceived, the causal powers of lesson study exist. Their capture and study through empirical research therefore become less concerned with their establishment as facts and more oriented towards their exploration and conceptualisation. To unpick these causal powers, interviews designed to explore the reflexive processes of teachers with regards to their development, and within this, their perceptions about lesson study, become the main informative tool of this methodology and conceptualisations based upon observations and interview data become the main evaluative tool to inform and develop the model of lesson study presented.

In line with the emergent causal properties (Section 5.2. Conceptualising Teacher Change), Mynott’s model links the overarching structural properties of lesson study (time, collaboration, expertise, and facilitation) to the general idea of a “potential learning opportunity”. This is what I termed ‘aspects of teacher knowledge’ (as defined by Shulman (1987)). Whereas Mynott’s model is intended to terminate with what it deems as learning outcomes, my proposition follows these outcomes to their realisations as concrete elements of teaching (‘strategies and solutions’), which can simply be the lesson resources produced as a result of the lesson study or the ‘refinement of
existing or development of new pedagogic dispositions’ which are drip-fed into practice through self-efficacious adaptations. Importantly, I do not go about recreating Mynott or Egel’s outcomes, but particularly attempt to subvert these taxonomies to enable the ‘best case scenario’.

This necessity to purposefully meddle with the practical ‘spaces’ arises out of my distinct dual role, primarily as a leader of the team of mathematics teachers at the Academy and secondarily as a researcher. The former dictates that I take every opportunity available to develop and nurture the talents of my team in order to best serve the students. Therefore, when I find myself better able to direct support or design supportive structures which enable the causal powers of lesson study, I must do this, rather than merely noting or recording such instances. The Action Research paradigm proves itself invaluable to resolving this particular dilemma of the professional doctoral researcher, without compromising on the rigour of the research.

Indeed, having established the constructs of lesson study and as an extension to the Mynott model, my aim in this phase is therefore to design particular ‘enablers’ to support the attainment of lesson study outcomes and effects, thereby counteracting the constraints I had discovered. This aim can be visualised in Figure 7.3 below:

![Figure 7.3. Enabling high-level lesson study outcomes for long-term change](image)

As per the Structure-Agency-Culture triad of Archer (Brock et al., 2017), this model seeks to be: informed by the culture of the school/department (constrained by its policies and workload demands), structure-giving through the design of enablers (processes to counter these contextual constraints), and agency-affirming (evaluated in terms of its success in giving teachers agency to
re-frame their practice). More importantly, evidence of morphogenesis is sought to aspects of teacher practice.

Having addressed the many ways in which teacher agency is constrained by structures, I wish to delve into an “analysis of actors’ accounts of their experiences and orientations, as the location of such accounts within a wider complex of causal mechanisms provides the basis for assessing both their motivational efficacy and their cognitive adequacy” (Mills et al., 2010a, p. 2). Thus, this “intensive, tightly focused, single case [study] provide[s] the basis for fuller understanding of the operation of [this] specific causal mechanism” (p. 3), with critical realism offering a distinct approach to interviews that is “theory driven” and evaluative of the action-research-built implementation model of lesson study: “to explore, refine, and test the character of proposed mechanisms and contexts and the ways they link to outcomes”. Interviews are also cumulative, rather than discrete datasets, hence validating the continued use of a ‘woven narrative’, using the Teacher Profiles and my overarching narrative voice.

At its core, this thesis is still chasing the ideal of lesson study: the manifestation of the emergent causal properties through an emancipatory experience for the participating teachers. Following a lack of evidence to support this in Phase 1, I did not find it disproven, rather, I concluded that that the social conditions were not suitable for the implementation of lesson study, which itself had not been properly deconstructed and conceptualised in relation to its social realities. The observation of a multitude of complex interlocking structural constraints were observed and a purpose was formed to provide the participants with the tools and space to actually take part in lesson study. To meet this purpose, I had to begin with the design of enablers, powerful enough to counter the negative impact of the structural constraints.

Case study question

Remaining within the action research case and study frameworks but more broadly overarched by a critical realist meta-theoretical approach, the final iteration of this research takes the form of a critical realist evaluation of lesson study for professional development, thereby
dropping its observational focus on ‘teacher practice’. This leads to a case study question which is intent on acting in the interest of lesson study, namely: How can lesson study be adapted to meet the professional development needs of mathematics teachers in a tough school?

Having re-conceptualised lesson study beyond a step-by-step process and towards a methodology essential to the professional development of teachers, professional development itself is similarly re-positioned, as a guiding thread to teaching and part of the core strategy, not merely an optional extra.

The previous question ‘What are the enablers and barriers to the development of pedagogic dispositions and self-efficacy when teachers participate in lesson study?’ produced a much more complex answer than was anticipated. A range of structural, cultural, and agential constraints were encountered, requiring further unpacking in this phase. Moreover, the swapping of the interrogative particle ‘what’ to ‘how’ reflects the action research resolve: no longer merely satisfied with analysing lesson study in a context, the objective is to insert it more firmly into the context.

As a beginner researcher, the step-by-step case study methodology provided a comforting sense of planning and purpose, which was very easy for me to follow and implement. Supplemented by critical realist techniques, this methodology will be given the depth I required to seek genuine answers to the ambitious questions I truly wished to pose. Armed with a critical realist mindset (and its accompanying toolbox of analytical devices), I make the necessary methodological amendments, reinforcing the overall integrity of the research purpose. The result focuses less on practice and becomes more exploratory of the general reactions of the teachers, as they grasp the realities around them.

7.2.2. Lesson Study/Professional Development Implementation Framework

Rather than further attempting to modify aspects of lesson study, this section establishes a broader professional development programme, within which lesson study is positioned. This is
felt to address more of the contextual issues, in order to ultimately bolster the implementation of lesson study.

The challenges in implementing lesson study in Phase 1 (somewhat, but not entirely separate from the challenges in academically evaluating it) could be thematically arranged as logistical (time constraints at the Academy mean that lesson study is doomed to remain an ‘after-school activity’ for the foreseeable future), motivational (interviews demonstrated that the teachers do not count it as a key development point) and unintegrated (it remained a separate non-integral activity to the core of our practice, just an ‘add-on’).

The logistical issues, whilst the simplest to understand, were the most difficult to combat. This is because of the hectic nature of our work (as explored in depth on Page 36): several unplanned activities crop up on a daily basis which require immediate attention, as well as the omnipresent umbrella of ‘admin’ tasks which must be completed regularly, on top of actual teaching. Care had been taken to avoid scheduling lesson study meetings close to late working evenings (such as parents’ evenings) or during pressure points (such as exam preparation season which runs from April to May prior to the major external GCSE and A-Level exams, which require most teachers to run additional preparatory classes or even the first few weeks of September, during which there are always teething problems with starting the academic year). Personal consideration was also afforded to individuals who needed to leave work early due to childcare arrangements, those who ran after-school classes or ran after-school detentions. This left very few potential meeting dates and once scheduled, these could easily be upset by unplanned absences or teachers with additional responsibilities being required to attend to other matters urgently (for example, a Head of Year might have to deal with a major incident which took place that day). This version of lesson study had (no choice but) to operate as effectively as possible, with as little time investment as possible.

The unintegrated nature of lesson study required a more creative solution. There was something distinctly lacking in every lesson study implementation strategy I had encountered to
date: glue. Many of them are designed as stand-alone programmes involving three stages: introduction, facilitation, and evaluation. In the hectic environment I operate in, this is not enough to make anything stick. To rectify this issue, I saw an opportunity to position lesson study within the existing performance management and professional development structures at the Academy. This was informed by my experience in my current school, in response to its staffing and management needs, and as an attempt to turn an existing imposing protocol like performance management into something genuinely constructive. With a high turnover of staff and many young, inexperienced, and non-specialist teachers within the department, I also needed a means of helping the teachers to manage their practice which would therein enable me to deliver targeted support as early as possible.

Pertinent to the Academy is the mismatch of requirements and teachers’ ability (knowledge, skills, and self-efficacy) to fulfil these requirements: what they have to do does not align with what they can do. There often exists multiple ‘ability-practice gaps’ and no time or structures are provided to support the teacher in surmounting them. These are manifested in the inexperienced non-specialist teachers in the maths department and the constant allusions to a ‘hectic’ environment. If a chaotic environment is taken to be antonymous to a structured environment, a hectic one would be somewhere in the middle of this spectrum. A high volume of tasks require completion at a fast pace, due to low capacity (not enough or not ‘good enough’ resources, including teachers), which then leads to high workloads constantly draining the workforce of time and energy, which ironically also need to be channelled towards improving these workflows. This model of professional development would therefore need to address these ‘ability-practice gaps’ whilst simultaneously carving time and energy out of the teachers’ packed workloads.

Proactive Professional Development

In order for the reader to better appreciate my model of professional development, I make a third ‘diary entry’ (see Appendix B.4. The secret life of a middle leader). This one differs from the previous ones in that it is a summary of my specific journey as a middle leader at the Academy and covers the specific set of challenges I was hoping to meet. This is supplemented
with ‘My teaching style’ (Appendix B.5), which exposes the attitudes which have influenced my leadership style and the type of teaching I exemplify to my team. These reflections enabled me to pinpoint three guiding values around which I surmise any professional development programme needs to be encased:

- **Teamwork** – working in collaboration with each other both within the team and across different teams, to achieve the best outcomes for students.

- **Empathy** – recalling the socio-economic and personal contexts of students and remembering the workload of colleagues.

- **Ambition** – driven by the need to make a change to the lives of our students.

Phase 1 had established that managing the Maths team at the Academy is no small feat: **the needs of the teachers are almost as diverse as those of the students.** Firstly, I needed to carefully balance the skillset of the teachers with the requirements of their classes, whilst also providing the teachers with appropriate, but not overwhelming, challenge. Secondly, I needed to delegate and monitor specific targets, with the intention of increasing standards overall. This was most difficult in situations where the teachers were faced with too much challenge or when we did not have the capacity to support their specific needs. For example, the maths/economics teacher was completely new to teaching when they found themselves the sole A-Level economics teacher at the Academy. There was no-one in the Academy from whom they could seek subject-specific support and they had sole responsibility for the A-level results, putting them under tremendous pressure in a so-called ‘baptism of fire’.

If these two criteria (of sufficient support and challenge) were met, I would be able to focus my energy on broader constraints to teaching and learning which were being poorly managed at the organisational level. By creating my own successful structures and systems to deal with these issues, I would also be able to shield the teachers from additional workload drains and enable them to focus more effectively on their teaching and their development.
I had already had some success with such initiatives, for example in my creation of an internal behaviour management. This started with the observation that too many students were being given too many detentions by the same few teachers, resulting in the teacher and student involved entering a negative cycle of constant punitive measures which had no effect on rectifying the behaviour and ultimately led to the demise of the student in the subject. In my opinion, these incidents mainly occurred because of student-teacher unfamiliarity and/or poor teacher preparation. I first developed a means of monitoring all detentions issued by the department and identifying these ‘repeat-offender’ situations. The teacher would then have to organise a parental meeting involving themselves, me, the student, and a parent/guardian, during which we would collaboratively agree to some action points for both the student and the teacher. Importantly, I would reinforce a message of support for the student: we did not wish to punish them further and want to know what we can do to support them. From this perspective, the parents and students are not defensive and rather than focusing on negative past behaviour, the conversation is directed towards future positive possibilities. These plans would be logged, and the teacher would update me on the progress a few weeks down the line. Using this strategy, the Maths department eliminated the use of sanctions for non-serious behavioural issues. This approach was only developed once I understood the extent of the frustrations of some of the students (essentially by getting to know them better and by working more closely with pastoral managers who were clued into personal histories) and was able to synthesise this with a wider knowledge of the teachers’ skillsets and their personal histories too.

As well as the creation of such broader structures and systems, I also identified a range of useful management and mentoring strategies, similar to the techniques listed by Villegas-Reymer (2003) in her international review of professional development and akin to the elements of lesson study listed on Page 57 and referred to in Table 5.1 (the emergent causal properties of lesson study for professional development):

- Modelling teaching by co-planning and delivering a lesson to a particularly challenging class for a teacher. This teacher would observe my behaviour and reactions and I would get first-
hand experience of teaching the class in question and therefore be better informed to further advise the teacher with regards to strategies and tips for managing behaviour or engaging students.

- Observing lessons and co-developing strategies for improvement (e.g., the lesson was not challenging enough for students of that calibre, use a different type of starter from this bank of resources).
- Teaching the teachers by breaking down subject-specific or pedagogic concepts, pointing out potential misconceptions along the way (more relevant to new or non-subject specialist teachers).
- Mentoring/coaching conversations with teachers to ensure they are reflecting on and developing their practice. Ideally, I would have liked to do this with everyone in the department regularly, but often had to prioritise less experienced or struggling teachers.
- Departmental-wide consultation meetings involving all members of the department to discuss systemic issues and potential solutions. Such a meeting spurred the behaviour management system discussed above.
- Leading a student-centric approach to teaching in terms of re-evaluating situations from the student’s perspective, factoring in the student’s history and social relationships (with peers/teachers/adults) and family context (parents disengaged, unable to cope with the student, overly strict, etc). This involved sharing my own experiences of teaching difficult classes and my approaches, with teachers as well as modelling positive reinforcement strategies.
- Coordinating student-teacher-parent meetings for the purpose of spurring academic performance (especially for older exam-age students), and not just to discuss behavioural issues.
- All members of the team taking on tasks in addition to their normal teaching to support the goals of the department (organising trips, clubs, special events and supporting all students regardless of whether they teach them or not).
• Developing team spirit through social events and creating a climate of support amongst everyone in the department (where all teachers support each other in whatever way possible and we are all aware of the issues some teachers are having and are ready to step in and support when/as required).

• Offering all teachers opportunities to take on additional projects through which they can develop leadership skills to pursue future career enhancing opportunities. For example, supporting applications for paid external courses or training, fulfilling requests to teach particular classes and informal cross-teacher mentoring.

Many of these strategies were reactive as opposed to pre-emptive: when an issue was observed, an active solution was conceived. Whilst effective, this was not efficient. My intention was to evolve this disjoint set of strategies into a more organised model which would propel every teacher to assess the needs of their classes and apply necessary interventions in a more systematic and timely manner. To inform this model, the subsequent types of professional development (Kennedy, 2005) take a step away from prescriptive forms of knowledge or skill-sharing, towards more collaborative approaches which encompass broader values. These are also similar to the broader ‘phases of lesson study’ from Table 5.1 (the emergent causal properties of lesson study for professional development).

• Coaching is separated from mentoring in that the former is more skills-focused whereas the latter involves “an element of counselling and professional friendship” (Rhodes & Beneicke, 2002, p. 301). Regardless, this is a one-to-one relationship with a defined mentor and mentee, which given the right purpose can be transformational, but also bears the danger of being purely transmissive. At the Academy, the use of coaches was promoted by one senior member who was passionate about the concept and all new teachers (to the profession) were allocated mentors within their departments.

• A community of practice can be similar to the coaching/mentoring model but would involve more people and be devoid of confidentiality. Whilst every teacher is likely to be a member of multiple communities of practice, this does not constitute a transformative
means of professional development, unless given a clear purpose and/or not dominated by social hierarchy which can “perpetuate dominant discourses in an uncritical manner”.

- Action research (or situated enquiry), conducted in a community of practice, is exactly what lesson study advocates.

The last model discussed by Kennedy (2005) is the one I employ in this phase. This “transformative model” involves “the combination of a number of processes and conditions” with “effective integration of the range of models described above, together with a real sense of awareness of issues of power” (p. 247). She also called for “greater interrogation of both the purpose and the potential outcomes of CPD structures” (p. 235), as this purpose can re-position the later approaches as transformational as opposed to transmissive.

Whilst it was essential that lesson study was central to a professional development model, it was no longer viewed as the key driver of professional development. This followed the realisation that **whilst lesson study is extremely useful to the development of teachers, it is not necessarily the most efficient component of professional development for every teacher**. The discovery of these more efficient components required an assessment of the teacher’s needs and context.

The model also needed to be all-encompassing, like Leithwood’s (2002, p. 89) which focuses on: “developing survival skills; becoming competent in the basic skills of teaching; expanding one’s instructional flexibility; acquiring instructional expertise; contributing to the professional growth of colleagues; and exercising leadership and participating in decision-making”.

Thus, **Proactive Professional Development**’s constitution was defined within three strands (only one of which was lesson study), broadly inspired by the Teach First Leadership Development Programme I experienced as a trainee teacher (Teach First, 2011), or three core developmental purposes:

- **Developing self** – All teachers continuously seeking to further their own professional development, by identifying areas for improvement or expansion, of specific teacher
content knowledge, in relation to the challenges posed by their current classes and/or their career trajectory, as informed by Diamond’s (1991) “personalistic teacher education”.

- **Developing teaching** – Using lesson study to develop and embed teaching practices and elevate teacher knowledge, refining and co-defining sound pedagogical dispositions and developing self-efficacy to enact these meaningful changes.

- **Developing people** – Mentoring and coaching others (teachers and students) to develop their skills, knowledge, and self-efficacy, as exemplified by many of the aforementioned strategies.

Admittedly, this model completely ignored most of the elements of ‘official’ professional development which the Academy had imposed on us (INSET days and the weekly after-school sessions). These were considered poorly informed and poorly executed, with no real objectives other than fulfilling the school’s requirement to be shown to deliver training to its staff. It was an accepted 2-hour punishment we had to submit to every week in order to enjoy a two-week October half-term break. In stark contrast to these ineffective procedures was the term ‘proactive’: taking back control of our teaching and ultimately restoring order to our hectic environment. Like lesson study, this encouraged a bottom-up problem-solving approach: teachers could not sit and wait for leadership to solve issues for them, we had to band together and combine our capacity to develop our own solutions.
Around the three strands, stood the three guiding principles of ambition, teamwork, and empathy. Although these did not directly form part of PPD, they were unique to the skillset I deemed essential for success at the Academy. Ideally, such values would be co-defined by the entire department or organisation applying PPD, to guide teachers through tough decisions.

The three core implementation strategies of PPD aligned with its three strands to form an updated version of the framework (see Figure 7.5 below):

- Developing Teaching would be mainly achieved through engagement in lesson study,
- Developing Self would be guided through Personal Development Plans and
- Developing People would primarily involve mentoring.
The benefits of lesson study to the development of teaching have already been explained in great depth. In line with Kennedy’s (2005) suggestions and within my limited set of resources, mentoring, was considered the next most useful framework for professional development. The purpose of such mentoring could fluctuate between training-based (to close any crucial knowledge gaps for non-specialist maths teachers, for example) or coaching-style (to encourage teachers to reflect upon their own practice in the spirit of ‘critical friendship’).

To link this new system with the Academy’s existing standards-based structures, the Personal Development Plan (see Appendix C.3. Personal Development Plan template) was created as a simple document which enables teachers to get a clear overview of their targets, within the faculty targets and Academy targets and in line with their performance management requirements. This may seem like a counter-developmental structure; after all, weren’t performance management targets artificial constructs completely disjoint from true developmental targets? Not necessarily.
Since its introduction in 2014, performance-related pay had been a bone of contention amongst teachers. Like Ofsted and League Tables, I was unimpressed with debates which did not change the position teachers find themselves in. An entire essay on why these measures are ineffective is great; how does it actually help a teacher deal with them? Until they are abolished, my aim was to provide a practical solution for dealing with them. Encouraging staff to write more strategy-based and non-quantitative targets, I guided these targets to being more developmental. So rather than ‘attaining 50% Grade A’ in a class, I proposed ‘implementing effective intervention to support students in attaining their target grades’. These more open objectives would also give teachers more room to justify their attainment.

The most important aspects of the PDP were the Performance Management Action Plan and the Teaching Plan to help break down these larger targets into more personalised objectives, down to single students. This was designed to spur teachers to conduct a ‘SWOT’ analysis (a business strategy technique used to assess internal Strengths and Weaknesses and external Opportunities and Threats) of their class, which would be used to inform discussions with myself during performance management reviews or meetings in general. As well as an Additional Responsibility Plan, records of meetings and evidence logs were included to enable the teacher to keep track of all other significant events to their professional development.

Proactive Professional Development coalesced the well-established idea of lesson study with teacher Personal Development Plans and was bolstered by underlying personalised support structures, as demonstrated in the figure below:
Lesson study had not been sticking as well as its proponents had hoped because there has been a lack of clarity on long-term implementation strategies. By trying to get lesson study to work for me, my teachers, and my school, I was hoping to contribute to the glue which might ultimately enable us to embed lesson study more effectively into UK schools, and perhaps generally outside of Japan. Rather than forcing lesson study through the door and scrambling to find the hours to conduct a lesson study, I was suggesting we re-think the framework within which we are trying to make it fit. By abandoning time-wasting passive professional development practices and embracing a more Proactive Professional Development, we could place the philosophy of lesson study at the heart of our teaching and finally start moving towards a more effective model of professional development, fit for the schools we work in.

As a ‘middle leader’ in a challenging school, I wasn’t offered any frameworks, toolkits, or strategies to help me navigate this role when I took it on. It was understood that I would develop my own in response to my situation and be resourceful enough to continuously respond to such
demands. Therefore, my intention in creating such a framework was also partly to support other middle leaders in similar situations, hence my creation of ‘A middle leader’s guide to nurturing excellence’ (Appendix C.2), guiding them through the elements of PPD. This provides an overview of the approach, in the format of practical step-by-step prompts and links to the Personal Development Plan and Lesson Study Journal. This document makes specific reference to various strands of professional development, such as mentoring. It also draws attention to the balance between support and challenge, using SWOT (Strength Weaknesses Opportunities and Threats) analyses, as a tool for self-reflection.

7.2.3. Phase 2 Procedures

The case study question (the core interest this phase of the case study seeks to address empirically) is: **How can lesson study be adapted to meet the professional development needs of mathematics teachers in a tough school?**

As per a critical realist conceptualisation, a successful implementation of lesson study is posited to lead to the development of (objective) elements of teaching and the refinement of (subjective) pedagogic dispositions. The concrete elements of lesson study (distinct processes such as pre-lesson discussions, producing a lesson plan or interviewing students) form the five phases (putting the team together, framing the research focus, the teaching and observation cycle, the research lesson and reflection and dissemination of findings). The ‘essence’ of what uniquely constitutes the construct of lesson study remains collaborative planning, observation, and reflection. Thus, this proposition identifies potential causal mechanisms in that ‘properties’ such as teamwork and enquiry may activate causal powers such as collaboration and innovation. How then, does one measure or observe innovation or collaboration? Teamwork, being a simple act of ‘working together’ can be simply achieved through the delegation of tasks whereas collaboration is the true subjective adoption of a different perspective. Similarly, someone who is asking questions can be observed to be ‘enquiring’, even if they have no real intention of listening to the answers or assimilating these views with their own pre-existing dispositions.
The renewed *case study propositions* (and *anticipated scenarios*), formed in line with the case study question but within the scope of the empirical study, now placed a greater importance on the professional development structures which support teachers and therein enable them to engage with lesson study more actively:

1. Suitable support structures are required to bolster teaching in challenging environments first and foremost – *teachers who feel supported will be best able to engage with development practices.*

2. Lesson study is only as effective as the teacher is willing and able to engage with it – *teachers require pre-requisite knowledge and self-efficacy to be able to engage with lesson study.*

3. Lesson study is able to affect practice without a deep and meaningful impact on teachers’ dispositions or beliefs – *teachers might not express changes to their dispositions or beliefs, but might still modify elements of their practice (indicating previously neglected incongruences between practice-beliefs)*

Thus, unlike ‘Figure 6.3. Anticipated outcomes of participation in lesson studies’ and ‘Figure 6.4. Transformative potential of lesson study’, there were no pre-emptive attempts to directly quantify or correlate the level of engagement with the instructional outcomes of lesson study in Phase 2. Instead, a method of realist evaluation (Pawson & Tilley, 2004) will be applied to derive potential configurations of mechanisms which can be linked to types of outcomes.

The *units of analysis* were now only four teachers participating in the lesson study, namely Teachers #1, #4, #6 and newly introduced #7. This provided three teachers over a period of 2 academic years, as well as an equally interesting case of a teacher ‘converting’ to maths.

As before, the data collection aims to capture the actions, comments and perspectives of teachers enriched with a running commentary to add the contextual backdrop, as they engaged in professional development and lesson study.

The following constitute the data corpus of this phase of the research:
1. Semi-structured teacher interviews
2. Recorded discussions and notes from meetings
3. Lesson observations, lesson plans, lesson resources and student work
4. Personal Development Plans of teachers (described in Section 7.2.2. Lesson Study/Professional Development Implementation Framework)

This was purposefully decreased in range, to suit the deeper analysis required by the new critical realist methodological stance.

In their recommendations for the realist evaluation of policy programmes, Pawson and Tilley (2004, p. 3) explore some facets which are key to “understanding and probing [a programme’s] apparatus of change”. Many of these concepts have already been explored in terms of lesson study in this work. They were therefore applied to the PPD programme, within which lesson study was positioned.

(i) Programmes are theories

The theoretical grounding for lesson study centres around collaborative enquiry as a means of furthering teacher development. PDP, on the other hand, suggests that lesson study alone cannot address the breadth of developmental needs encountered in (hectic) schools. PDP therefore draws from the broader values around the emergent causal properties of lesson study to attend to more urgent needs. With lesson study at the core, it is merely the explicit attachment of reflective tools and further collaborative practices to ‘turbo-charge’ aspects of teacher development requiring immediate attention (e.g., sub-standard teacher subject knowledge).

(ii) Programmes are embedded

The social realities which influence teacher change have been much discussed in terms of the individual capacities of teachers, interpersonal relationships between them, institutional constraints and enablers and the wider infra-structural systems which support or undermine teacher autonomy in the classroom.
A particular issue resolved by PPD about lesson study was that the latter is not an easy fit with the performance-measured systems the Department for Education is most keen to promote: lesson study takes far too long to take root and results might not indicate any measurable impact within the four-year election cycle. Through the Personal Development Plans, a handle is kept on performance management targets, whilst the proven technique of lesson study is engaged to develop teaching, teachers, and curricula.

(iii) **Programmes are active**

As a grassroots-level activity, the effectiveness of lesson study is based upon the attitudes of the participating teachers. Their buy-in is informed by their reflexive processes and it is key to the ultimate outcomes of lesson study. The most knowledgeable and self-efficacious teacher could take part in a programme but still not benefit from it if they do not wish to or if they find fault with it. Secondly, the social realities of the teachers involved in lesson study can complement or hinder the process, based on cross-teacher relationships, culture in the department, organisational position and teacher beliefs and dispositions. PPD is no less variable: it is very reliant on the leader implementing it and this person’s values with regards to education and teacher education, would affect the way it takes shape. This flexibility to be moulded to individuals and individual contexts, is what makes programmes like lesson study and PPD powerful, but also leaves them at the mercy of individual agendas.

(iv) **Programmes are open systems**

There is a myriad of external factors which affect and shape lesson study. Whilst lesson study has been used successfully in Japan to influence these externalities, the picture in England is nowhere near that of the Japanese. And indeed, it is doubtful that the Japanese case is indeed as homogeneous as it is generalised to be. In terms of national policy, England does not demonstrate the intention to invest into long-term professional development programmes like lesson study, let alone beginning on the path of deep imbedded implementation. Indeed, until the current educational culture shifts from accountability for results towards respect for the teaching
profession and safeguarding of teacher autonomy, lesson study, PPD and programmes like them will be limited in terms of their success.

**Interview Guide**

Although these were not intended to be the final interviews, due to the unexpected COVID-19 school closure, they ended up becoming so. These interviews were intended to explore the ‘discernment, deliberation and dedication’ processes of the teachers, particularly probing three themes:

- How does the teacher conceptualise their problems right now?
- How did this feed into their ability to visualise possible courses of action?
- How does the teacher view themselves?

<table>
<thead>
<tr>
<th><strong>Interview Questions</strong></th>
<th><strong>Rationale and Purpose of the Interviewer</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In terms of your priorities, issues, and concerns, can you talk me through how things are for you: (a) in life right now? (b) in school right now? (c) with your most difficult class right now?</td>
<td>What are the concerns of this individual right now? The assumption is that these major “life concerns” permeate many aspects of one’s reflexive processes, the so-called “back of the mind” which affects the front. Working up from life to school and then drilling down into a particular class, the intention is to de-layer the concerns.</td>
</tr>
<tr>
<td>2. Expanding on this most “difficult” class: (a) What are the problems you are experiencing? (b) What are you trying to achieve with this class? (c) What did you do with them last lesson? (d) What solutions are you proposing to deal with these problems?</td>
<td>As an example of a project the individual is working on, this will enable me to determine what type of reflexive thinker they are.</td>
</tr>
<tr>
<td>3. How did you craft these solutions? (a) Why do you think this might work?</td>
<td>From a practical perspective, this will enable me to consider the types of solutions I am trying to deliver to the individual/the department, with regards to their developmental needs.</td>
</tr>
<tr>
<td>4. How would you assess the quality of your teaching right now? (a) Good or bad? (b) What are some aspects of your teaching which you would like to keep? (c) What are some aspects of your teaching which you would like to change?</td>
<td>A self-evaluation of the “quality” of their teaching – perhaps the only evaluation that really matters!</td>
</tr>
<tr>
<td>5. Have you experienced anything (external) since September which has developed your teaching? (new knowledge, skills, tools, strategies or resources)</td>
<td>A repeat of the same question posed in Term 1 – another snapshot of how the individual views professional development and how they apply these.</td>
</tr>
<tr>
<td>6. How do you see yourself as a teacher?</td>
<td>A snapshot of how the individual views themselves – has this changed since Term 1?</td>
</tr>
</tbody>
</table>

*Table 7.4. Interview guide and rationale*
7.3. Phase 2

Whilst this phase was cut short by the global COVID-19 pandemic, the data gathered here (through an additional lesson study and two sets of interviews over the first two terms of the 2019-2020 academic year) was considered adequate for the purpose of drawing clear conclusions about the research question. This section begins the abductive analysis, drawing from ‘interesting’ aspects of the data to begin to inform tentative generalisations. These findings provide the foundations for Chapters 7 and 8, which return to the original dual research questions to clarify the definitions, implementation plan and process evaluation required for lesson study practitioners as well as constructing more generalised models of teacher development.

7.3.1. The Teachers

The previous phase incorporated 6 teachers (#1 to #6), only three of which are included in this phase. #3 and #5 left at the end of the academic year and #2 indicated they no longer wished to participate in the research (although they were happily still taking part in the lesson study itself). A new teacher, #7 was also introduced.

Thus, an update of the table presented in Phase 1 gives a new snapshot of the conditions of the teachers now involved.

<table>
<thead>
<tr>
<th>Teacher #1</th>
<th>Teacher #4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching experience</strong></td>
<td><strong>Teaching experience</strong></td>
</tr>
<tr>
<td>14 years – 2rs FE college, 4yrs Prison, 4yrs college, 4yrs current secondary (inc. 1yr supply)</td>
<td>4 years – 3yrs college, 1yr current secondary</td>
</tr>
<tr>
<td><strong>Specialist subjects taught (not specialised)</strong></td>
<td><strong>Specialist subjects taught (not specialised)</strong></td>
</tr>
<tr>
<td>Adult Education Business IT (Maths)</td>
<td>Maths Maths A-Level</td>
</tr>
<tr>
<td><strong>Strengths</strong></td>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td>Working with difficult students Well-established within the Academy</td>
<td>Non-specialist subject knowledge of maths Does not stretch themselves</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td><strong>Strengths</strong></td>
</tr>
<tr>
<td>Non-specialist subject knowledge of maths</td>
<td>Teacher of maths</td>
</tr>
<tr>
<td><strong>Current responsibilities</strong></td>
<td><strong>Current responsibilities</strong></td>
</tr>
<tr>
<td>Teacher of maths, business, and IT Head of Year 10</td>
<td>Teacher of maths</td>
</tr>
</tbody>
</table>

*(table continues on next page)*
<table>
<thead>
<tr>
<th></th>
<th>Teacher #6</th>
<th>Teacher #7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching experience</td>
<td>22 years – 5yrs secondary in South Africa, 2 terms supply in London, 10yrs grammar, 5-6yrs Pupil Referral Unit, 2yrs current secondary</td>
<td>1 year – Current secondary only</td>
</tr>
<tr>
<td>Specialist subjects taught (not specialised)</td>
<td>Graphics Design Maths (Maths A-Level)</td>
<td>Economics Business Maths</td>
</tr>
<tr>
<td>Strengths</td>
<td>Subject knowledge (up to GCSE) Strong disciplinarian</td>
<td>Subject knowledge (inc. Maths)</td>
</tr>
<tr>
<td>Weaknesses</td>
<td>Old-fashioned teaching style</td>
<td>KS3 teaching</td>
</tr>
<tr>
<td>Current responsibilities</td>
<td>Teacher of maths</td>
<td>Teacher of economics and maths</td>
</tr>
</tbody>
</table>

Table 7.5. Phase 2 teachers

The final reflective interview demonstrated the most variation in the teachers and encapsulated their current situations quite well. A useful way to generalise their types of thinking would be through Archer’s (2007) four modes of reflexivity: the meta reflexive who is critical and evaluative of their own inner dialogue, the autonomous reflexive who is self-assured and acts upon their inner deliberations, the communicative reflexive who requires affirmation from others before taking action and the fractured reflexive whose internal conversations further aggravate their inability to act.

#6 was the most assertive in their answers: concise and confident, they could explain their problems and strategies with ease. Their task-oriented approaches gave an indication of autonomous reflexivity.

#7 demonstrated autonomous reflexivity differently, with plenty of examples from their practice but they were a bit at a loss regarding their personal choices at that point in time. They had by now secured a new post at a “less stressful” school, perhaps as their final consideration to stay in teaching, but certainly as an attempt to explore the career as a suitable long-term option for themselves. With regards to that difficult decision, they were reticent and keen to discuss the consequences, as a communicative reflexive would.

#1 was unable to complete this interview due to a long period of absence due to sickness. However, quite a few of their lessons had been deemed ‘unsatisfactory’ by various senior
members of staff and they had been facing some difficulties in improving this. From their previous interviews, they could deem to be a communicative reflexive (deeply embedded in (extensions of) their natal social context). Similarly, #4’s constant communication with and self-admitted reliance on others, were also indicative of communicative reflexivity.

These reflexivity ‘judgements’ were not particularly clear-cut: all teachers interviewed certainly seemed to be communicative or autonomous, as would be expected given their profession and (similar) backgrounds. Importantly, these judgements did not necessarily contribute anything to my professional development plans for them or their own plans for themselves. Since none were meta-reflexives, it was difficult for them to ‘think their way around’ the constraints they found themselves within, or even to necessarily conceptualise them in a way which meant they could effectuate meaningful change.

The Teacher Profiles (see Appendix E) were updated based on the teachers’ interview responses:

<table>
<thead>
<tr>
<th>Parental background</th>
<th>Teacher #1</th>
<th>Teacher #4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Both professionals: senior NHS dietician and accountant</td>
<td>Father senior manager at large Kuwaiti company</td>
</tr>
<tr>
<td>Entry to teaching</td>
<td>Needed a job, was good at it and teaching came with childcare and flexibility</td>
<td>By chance, enjoyed tutoring and did not want to be an accountant anymore</td>
</tr>
<tr>
<td>Support received</td>
<td>No formal training, very little support over the years, learnt on the job</td>
<td>Semi-formal training for Qualified Status, mentored and formally trained at the Academy as a Newly Qualified Teacher</td>
</tr>
<tr>
<td>Immediate career ambition</td>
<td>“Falling into” pastoral responsibility as Head of Year</td>
<td>Additional responsibility in maths (being encouraged by mentors)</td>
</tr>
<tr>
<td>Progress on developmental priorities</td>
<td>Maths subject knowledge still not developed enough</td>
<td>Teaching younger students and behaviour management – made good progress towards these</td>
</tr>
<tr>
<td>Concluding state</td>
<td>In need of support with maths</td>
<td>Picking up more responsibility in the department</td>
</tr>
</tbody>
</table>

*(table continues on next page)*
Table 7.6. Summary of final interview

<table>
<thead>
<tr>
<th>Teacher #6</th>
<th>Teacher #7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parental background</strong></td>
<td></td>
</tr>
<tr>
<td>Father a teacher</td>
<td>Father a partner lawyer in a large firm</td>
</tr>
<tr>
<td><strong>Entry to teaching</strong></td>
<td></td>
</tr>
<tr>
<td>Restricted entry into engineering in post-Apartheid South Africa, teaching was a “safe and known” path</td>
<td>Joined Teach First as was unsure what to do after graduating</td>
</tr>
<tr>
<td><strong>Support received</strong></td>
<td></td>
</tr>
<tr>
<td>Formally trained in South Africa</td>
<td>Formally trained through Teach First (extensive mentoring)</td>
</tr>
<tr>
<td><strong>Immediate career ambition</strong></td>
<td></td>
</tr>
<tr>
<td>None for now! Was the Head of a Pupil Referral Unit for a while and Head of Year 10 at the Academy over a short period of time</td>
<td>Moving to a “less hectic” school and still considering a career in finance</td>
</tr>
<tr>
<td><strong>Initial developmental priorities</strong></td>
<td></td>
</tr>
<tr>
<td>Self-described as “old fashioned” this is an eternal development point, but not a priority</td>
<td>Developing well as a Maths teacher but would require more support with managing younger students</td>
</tr>
<tr>
<td><strong>Concluding state</strong></td>
<td></td>
</tr>
<tr>
<td>Picking up more responsibility in the department</td>
<td>Leaving the Academy at the end of the year to teach just Economics</td>
</tr>
</tbody>
</table>

7.3.2. Proactive Professional Development

Broadly speaking, and in terms of the “spirit of lesson study” (Wood & Sithamparam, 2015, p. 44), the supportive and ‘bond-building’ elements were more evident in the way the interviewees generally spoke about the department, rather than with specific reference to lesson study itself. Similarly, the notion of ‘evolving’ one’s teaching practice might be getting confused with transmuting it. Evolution suggests a slower, more subtle process of change which might occur over a very long period. The former is certainly a necessity as the students and the climate we teach in is constantly evolving itself. The latter feels more like the regular policy-driven changes we get submitted to on a regular basis. Changing fixed mindsets about the nature of non-conforming student behaviour (or ‘misbehaviour’) and teacher development as an evolutionary, non-rapid process presented the broader leadership challenge I experienced as a practitioner during this phase.

Further to this, the three strands of the Proactive Professional Development model, alongside its three guiding principles, are now reviewed.

(i) Developing self

The Personal Development Plans were the main guide towards this strand, and this was supplemented with regular conversations and meetings geared towards the goals and issues.
experienced by specific classes. Teachers did not make independent use of these documents, as they seldom sat back and reflected upon the strategic long-term goals of their classes, focusing their finite efforts on the day-to-day requirements of their jobs instead. These should have been reviewed at least once a half-term and in all likelihood, teachers would place greater importance on these if they were referred to by myself, more regularly. This suggests that simply issuing someone with tools, without training them on their use or giving them the time to experiment with them, is not sufficient to ensure the efficient use of these tools.

(ii) Developing teaching

By taking part in lesson study, teachers had the opportunity to grapple with a range of pedagogical issues, applying various aspects of their teacher knowledge. The diversity of thoughts and dispositions teachers brought to this process cannot really be appreciated because they didn’t all get an equal chance to assert these opinions (mostly due to the lack of time). Whether through perceived expertise or eloquence, some opinions get enforced over others, and with a larger group of participants, this leads to a shallower lesson study. Ironically, the desire to create a more democratic lesson study by enabling every teacher involved in the delivery of the lessons to participate, can create an environment where more assertive teachers simply get their way and others must submit to this. This reinforces the necessity for lesson study groups to consist of 3-4 individuals during the (decision-making) planning stages, then broadening and sharing discussions in the later delivery and evaluation post-lesson study stages.

(iii) Developing people

With strong interpersonal relationships between and amongst most members of the department, there was no lack of informal support structures. I was mentoring #4 and #7, #6 was formally mentoring another member of the department but also informally providing guidance and support to #4 and #7. In a similar vein, I was regularly advised, guided, and coached by both my line manager and another senior member of the Academy. Therefore, the mentoring and coaching element of the PPD strategy was probably the most successful in that it existed both formally and informally and was easily regularly scheduled.
Therefore, the guiding principle of teamwork was the most evident, with more explicit reference required towards empathy and ambition. From a leadership perspective, I tried to juggle the priorities of the department, which at that point were being balanced with my overall priority of securing good grades for the Year 11 and Year 13 students due to sit their external exams at the end of the academic year. These secondary priorities were: the creation and implementation of effective BTEC\textsuperscript{15} procedures (part of my responsibility for the business and IT departments, which I led alongside maths), the management and rectification of behavioural issues (which had been mounting to unmanageable levels across the department in previous years, partly due to fluctuating staff) and non-specialist teachers (there were three in a team of 12, as well as non-specialist cover teachers who were regularly required). These did not align well with the use of lesson study and required specific strategies and structures as well as much micro-management. As often mentioned already in this text, the necessity of urgent priorities redirected focus away from the more progressive developmental processes, and I would challenge anyone who thinks otherwise to put this into practice in my context before preaching as such.

**Personal Development Plans**

The intention, with the creation of the Personal Development Plan, was to create a structure which would support the reflection of colleagues, about their practice and their development, as well as to provide them with a meaningful way of engaging with the goal-oriented nature of the new age of ‘performance managed’ teaching. These were issued at the start of the Academy’s Performance Management cycle, in September 2019, and teachers were only encouraged to use them to guide their objectives and teaching strategies.

The exemplar PDP which I shared, demonstrates the level of reflective depth possible through the ‘Teaching Plan’ section of this document:

\textsuperscript{15} BTECs are qualifications in vocational subjects, assessed through mixed methods including practical tasks and coursework as well as externally assessed written examinations.
### Y13 A-Level Maths

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Profile</th>
<th>Strengths and Weaknesses</th>
<th>Plan of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 students</td>
<td>6 lessons a week</td>
<td>(i) Student X G&amp;T (ii) Consistent U-grade students: Student X and Student X (iii) E/U-grade students: Student X, Student X and Student X (iv) Homework and additional work always completed (quality varies) (v) Early SOW targets for increased revision time: Pure2 by Dec and full coverage by Feb.</td>
<td>* Boundaries are under-estimates, grades should be better * Regular assessment and feedback + shared with parents * 6th lesson has been added on by the teacher + extra holiday sessions * Extra resources obtained (Resourceaholic, Practice Papers+ and Pearson/CGP workbooks) and papers constructed for Mocks (i) Extension using MAT/STEP + applied to Cambridge (ii) Parental meetings Aut1 + action plan – Student X is completely demotivated and has been trying to drop Maths since last year. (iii) Parental meetings Aut1/2 (iv) Quantity decreased so that quality would increase (v) Additional (Pearson) workbooks and re-teach period from Feb-May</td>
</tr>
</tbody>
</table>

* Current Grades = 5U, 3E, 4D, 2C, 1B
* Target = All E+, 8 C+, 3 A+ 
* New Spec = lack of resources and few assessments

---

**Table 7.7. Exemplar Professional Development Plan**

A lack of depth was visible in Teacher 4’s plan for their Year 11 class at the start of the research cycle:

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Profile</th>
<th>Strengths and Weaknesses</th>
<th>Plan of Action</th>
</tr>
</thead>
</table>
| 26 students | 6 lessons a week | Strengths:  
- Motivated  
- Predicted grades 5+ for the whole class. Weaknesses:  
- Lack of basics.  
- Too energetic sometimes to complete the tasks properly.  
- Lack of revision  
- Lack of confidence | Maths intervention from November 2019 onwards. |
| 6 G4, 5 G3 | All G7 May  
All G6+ Mar  
All G5/6 Jan  
All G5 Nov | |

---

**Table 7.8. Teacher #4 Professional Development Plan extract**
Similar, teacher #7’s Year 13 Economics class plan is basic:

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Profile</th>
<th>Strengths and Weaknesses</th>
<th>Plan of Action</th>
</tr>
</thead>
</table>
| Y13 Economics A-Level | 7 students 5 lessons a week (+Wed P7 for catch-up)  
Current Grades = 2C, 1D, 2E, 2U  
TARGET = Student T - A  
Student U - B  
Student V - C  
Student W / Student X / Student Y / Student Z - D | Literacy skills – essay writing 5/7 EAL | (i) Speak with Teachers X & Y about essay writing for EAL students |

**Table 7.9. Teacher #7 Professional Development Plan extract**

But Teacher #6’s is much more reflective:

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Profile</th>
<th>Strengths and Weaknesses</th>
<th>Plan of Action</th>
</tr>
</thead>
</table>
| Year 11 Class Y | 29 students 6 lessons per week  
Target grades for all students is 6+  
Three students have achieved a grade 4 in the last years exam and my intention is to ensure these grades go up | All students are potentially a grade 6+ students, however, there are some that lack effort and focus  
All students work at a good pace and getting through the topics much quicker including the grade 7-9 topics | *Envisage on implementing intervention classes on Wednesday for targeted learner who are under performing.  
* Interventions for those students who intend on improving from grade 7 to 8/9  
*Also, covering the more AO2 and AO3 type questions |

**Table 7.10. Teacher #6 Professional Development Plan extract**

Teacher #1 chose to not engage with the PDPs, and this was not further imposed on them.

Whilst this cannot be the sole determinant of the teachers’ reflective capabilities, their ability to articulate their objectives and to commit them onto paper was somewhat reflective of their ability to unravel the barriers to learning experienced by their students and hence to develop strategies to bolster these students’ attainment (as defined by performance in exams). Both Teachers #4 and #7 (the two least experienced members of the department) were coached to reflect more deeply on the specific classes in the extracts above, particularly considering these were exam classes (students due to take their external GCSE or A-Level exams that academic year and therefore seen to be important in terms of their contribution to the Academy’s metrics of performance).
Educative Mentoring

Whilst it wasn’t a core aspect of the research, nor was it particularly theory-imbued, the role of mentoring as part of PPD could not be understated. Unlike traditional expert-novice views of mentoring, what was implemented was akin to “educative mentoring” practices. As originally defined by Feiman-Nemser in 1998, Mackintosh (2019) pens this as: situated enquiry, joint work, “thinking aloud”, foregrounding pupil learning and “bi-focal” (addressing long-term goals as well as short-term concerns).

Specifically, I was formally mentoring #4 and #7, using some of the techniques mentioned above and this was resulting in much increased confidence in both teachers, both of whom were judged to be ‘performing well’ by senior leaders. This was reflected in both being offered promotions with additional responsibility alongside financial renumeration. Whilst a direct causation between the mentoring they received cannot be drawn and these external judgements do not necessarily indicate ‘good teaching’, it is unlikely that the mentoring did not contribute to their development as teachers.

Meetings and observations

With 15 meetings in the 2018-2019 academic year alone, meetings proved to be a key means of driving this project forward as well as collecting data. Looking back at notes, materials, and transcripts however, these clearly varied hugely in terms of quality of outcomes. The shortest meeting was 20-minutes long (the de-brief following the second lesson study cycle) but most of them lasted around one hour, and unfortunately, were heavily led by myself. This was something which I had not intended when initiating the meetings, however time and energy constraints made it a necessity; had I not intervened to deviate focus during the meetings, they would have lasted far longer and possibly been considered a waste of time by colleagues. Undeniably, a lack of initiative on my behalf would have resulted in the lesson studies not taking place at all.

Teachers contributed well: with virtually everyone present contributing at least one opinion or recommendation, but these were probably not deeply negotiated. With the excuse of time again,
opinions were judged against each other, leading to the clear dismissal and promotion of some ideas over others: these decisions were decidedly made by me, as I rushed to carve the path. To fully relinquish control would have been ideal in terms of driving up the ‘purity’ of the lesson study (an implicit agenda of this researcher) but also a major risk in terms of completing the cycles of lesson study: investing 20 hours into one single lesson study (as I had done when first introduced to lesson study) might have been transformational for the participants or it could have given them lesson study fatigue and jeopardised future cycles. Participants had also been given explicit reassurance against such a lengthy time commitment in the initial research contract: keeping meetings to an hour was a necessary obligation to this promise.

As an illustration, consider this pre-lesson study meeting during which teachers are planning a lesson on tessellations for a Year 7 class, to encourage geometric problem-solving. 15 minutes into the 1-hour meeting, I had quickly established the content covered by every Year 7 teacher, to be able to establish common knowledge bases of students, upon which this lesson study could then be planned, as well as defining a timeline for delivering the lessons through logistics of teachers’ timetables and ensuring no clash between events taking place the following week:

(15:00) #0 comes back in and starts accelerating the progress by deviating away from debates about the topic of the lesson (they’d moved to debating fractions again!)

#0 points out the maths of the tessellations – this is to do with whether their angles can be summed to 360. Focusing on triangles and maybe extending to quadrilaterals.
The definition of tessellations is narrowed down to “semi-regular” and “regular” tessellations.

(#2 and #6 talking under the breath the whole time – #6 obsessing about footballs as an example and #2 mentioning other examples, but neither of them sharing their ideas)

(20:00) #0 explaining how to prove whether something tessellates.

#1 is looking for physical items. #0 pushing through with the plan of the lesson. #1 suggests circles. #4/#2 mention polygons, #0 tries to keep focus on the simple shapes.

#2 suggest (90, 45, 45) – #0 asking for a non-right angle that still tessellates?
#1 suggests 50p coins. #6 points out that the coins are slightly rounded, which means we can’t actually get them to tessellate.

(28:00) #2 and #6 discussing how to use food tech laser machines to cut shapes. #6 knows how to use the laser cutter. They are discussing between the 2 of them how to cut on acrylic or wood.

#0 trying to calculate the angles. #6 distracting others.

(30:00) #6 thinks they’ve found one but #2 questioning #6’s work. #4 mentions parallelograms.

(78,78,24) suggested by #0. Everyone still working on this for a few minutes.

(#)2 mentioning a picture of the chemical structure of graphite – which is a good hexagonal one)

(72,72,36) by #6 and #6/#0 debate which types of numbers the isosceles triangle needs as angles (factors of 360)

(35:00) Practical elements of cutting things out pointed out by #1 so #6 suggests cutting the shapes using the laser cutter.

(120, 30, 30) #0 points out a good example due to obtuse angle. Seeking out a triangle where one angle only tessellates and the other 2 angles don’t.

#6 asking when we’re doing pentagons and hexagons? #0 says not to, to begin with.

#0 keeps the focus on the mathematics of the angles and the resources get made.

#0 delegates out the tasks to the teachers and pens the activities for everything.

Much of this extract involves #0 (myself) coaching the teachers to plan this lesson, as a result of which, many decisions are made in the short period of time which allows the lesson to take place the following week, with resources fully planned and even manufactured (#6 proceeds to cutting pieces of wood into accurate shapes using the laser-cutter in the technology department).

This lesson ends up being replicated by seven different Year 7 teachers, with varying subject knowledge expertise, across the entire year group and culminates in a poster competition the following week which results in three students winning vouchers as well as creating a lovely
display of their work for the Maths corridor. From an academic or lesson study purist perspective, the professional development of the teachers could be perceived as having been shallow or stunted. From the perspective of a teacher, such an ambitious feat is rarely accomplished in the busy environment we work in: groupwork, mathematical exploration, project work, the making of displays and independent student research are all the talk of daydreams (“we should really do more of…”). These are desirable tasks and activities which can rarely be prioritised over necessary/mandatory ones and the drive of a teacher with a leadership role affords the opportunity to dabble in these desirable tasks.

In retrospect, I would also consider this essential training for my team on how to accomplish mathematically ambitious tasks and would hope to be able to fully delegate the leadership of the next cycle (assuming a sturdy teaching structure whereby teachers were not being overly burdened by their workload).

7.3.3. Findings

As per its critical realist conceptualisation, the overall purpose of this phase was to assess the success of lesson study to the development of (objective) elements of teaching and the refinement of (subjective) pedagogic dispositions possible through engagement with the lesson study methodology.

The case study propositions (and anticipated scenarios) are now addressed.

(1) Suitable support structures are required to bolster teaching in challenging environments

first and foremost – teachers who feel supported will be best able to engage with development practices.

There is empirical data to support this. As with the cases of #4 and #7, the two youngest and most inexperienced teachers received the most support in terms of the protection of their teaching workload (reduced hours, with #4 and #7 teaching 80% of the normal teaching timetable, as well as being exempt from pastoral responsibilities and the need to perform lunch/break-time duties or cover lessons) and the regular meetings with mentors and coaches (#4 was mentored by myself
and coached by a member of the Senior Leadership Team and #7 was mentored by myself, a member of the Senior Leadership Team, a lecturer from their PGDE course as well as their training provider, Teach First). The engagement with mentors, meant their prioritised personal developmental goals were being addressed regularly, namely #4 was being supported with behaviour management and exam-preparation strategies and #7 was developing their subject and curricular knowledge of mathematics as well as their general KS3 to KS5 teaching strategies.

In comparison, #1 received almost no formal support, besides a few meetings to discuss the content of their lessons and #6 received decidedly no support. In terms of engagement with development practices, #1 was unable to do so, very possibly due to the lack of support and continuously changing teaching conditions of their teaching responsibilities.

All teachers readily engaged with the lesson study cycles, in whatever capacity they could, but the teacher who demonstrated the most reflective aptitude with regards to their wider development was decidedly #7. This might be correlated with the fact that they were in receipt of the most support, or it could merely be due to their own innate ability to reflect on their practice and apply these changes, in collaboration with other teachers. In contrast, #4 and #6 were more passive in their contributions and engagement, indicating they did not necessarily see the inherent value of the overall process or perhaps just generally did not enjoy it.

(2) Lesson study is only as effective as the teacher is willing and able to engage with it – teachers require pre-requisite knowledge and self-efficacy to be able to engage with lesson study.

With varying amounts of teacher knowledge and arguably unquantifiable and constantly evolving capacity for self-efficacy, the teachers in this sample were diverse in their backgrounds and outlooks. However, even the teacher with the least subject knowledge was able to effectively contribute to lesson study at all stages: pre-planning, delivery, and evaluation. Therefore, the data seems to contradict the pre-requisite knowledge aspect of this anticipated scenario. In terms of self-efficacy, specifically in terms of its dimensions of the ability or capacity to learn from the
observation of others, the role of agency in allowing knowledge to affect behavioural change and
the role of one’s environment and social context(s), the matter is more complex. Teacher #6 for
example, espoused the developmental need to observe others and adopt more “modern” teaching
strategies but they never made any concerted efforts to enact this simple task. Observation of their
teaching revealed a very much “settled” way of teaching each class: once #6 felt they had
designed an appropriate approach for a particular class, they merely followed this approach
consistently, and thereby delivered effective results. That is, #6 exercised their agency in the
sense that they did not truly see the benefits of behavioural change (a perfectly reasonable attitude
of “if my way works, then why should I change?”), but perhaps felt the need to say otherwise, so
as to not appear close-minded. They could also genuinely have wanted to adapt their behaviour
but were unable to do so due to the demands imposed onto them: lack of time and lack of focused
reflective practice could all contribute to a lack of self-efficacy.

(3) Lesson study is able to affect practice without a deep and meaningful impact on
teachers’ dispositions or beliefs – teachers might not express changes to their dispositions
or beliefs, but might still modify elements of their practice (indicating previously neglected
incongruences between practice-beliefs)

Previously, it was assumed that teachers have much more autonomy over their practice, and
even that they wish to be autonomous in the classroom. However, it may very well be that
teachers would more happily enact a set of well-designed strategies and resources, without these
encroaching upon their autonomy. Not only does the data support the existence of incongruences
between practice and beliefs, but it also suggests that practice is formed through habits which
teachers might be willing to modify with varying levels of contention. Then again, a lack of belief
formation also affects the long-term survival of a teaching strategy. For example, following the
first lesson study, a decision was made to introduce more problem-solving, specifically at the end
of each unit of work delivered. There was unanimous agreement to do this in the meetings but
literally no follow-through afterwards, from any of the participating teachers. This would be
indicative of this goal having been de-prioritised in favour of other projects, or that the true
importance of problem-solving skills was not fully internalised by participants. Either way, beliefs and practice remained unaffected in this regard. On the other hand, the structural changes to the scheme of work to include tessellations (the subject of the final lesson study) as the specific problem-solving project at the end of the unit of work on angles, meant that teachers were happy to simply deliver the pre-designed set of resources and had been equipped with the knowledge to do so confidently. This could be classified as a ‘shallow’ effect on practice, perhaps more out of convenience than perceived necessity, but then again, the very beliefs and dispositions which shape one’s practice may have all been put together out of such convenience or informal learning, rather than the extensively constructed sets of dispositions they had been assumed to be. This would also lend more credence to the toolkit used by Lewis and Perry (2017), and would indicate that the use of pre-existing resources might be just as useful as their creation within the lesson study process.

So, whilst lesson study can be deemed successful in developing (objective) elements of teaching, its ability to refine (subjective) pedagogic dispositions, remains contested, more as a virtue of such dispositions being hard to define as well as to empirically observe/record.

Equally, each teacher’s developmental journey is very much unique to their particular circumstances: #1 had found themselves immensely challenged when they had to teach Maths or risk slowly being made redundant, #4 was challenged by the behaviour management demands of younger students, having only previously worked with those aged 16 or older, #6 pursued two promotion opportunities which did not work out for external reasons and #7 was a recent graduate thrown straight into the deep end and no doubt exhausted by their own efforts to keep up with the demands of the job.

The mentoring aspects of the professional development was a means of offering direct support but could not be made available to all teachers due to the limited availability of teachers with the capacity to mentor. The Personal Development Plans were a means to keep teachers focused on their primary goals of enhancing the learning of their students by considering the
needs of each class as well as specific sub-groups of students, but time needed to be carved out specifically to step back and reflect on these more deeply. Of course, every teacher was constantly reacting to the needs of their classes, but they were arguably still predominantly doing this in a re-active as opposed to pro-active manner. This is what is to be expected given the ‘hecticness’ of the Academy and could also be down to a lack of ambition regarding the abilities of their students (i.e., lack of self-efficacy).

7.3.4. Emerging Themes

The initial Interview Schedule (see Appendix D.3) demonstrates the new exploratory nature of the interviews and unveiled interesting realisations.

Of course, there is no claim to ‘sameness’ amongst the teachers: they are unique individuals with unique “internal conversations” or reflexive processes. Thus, pertinent emergent themes are explored, before being more rigorously retroductively analysed in the subsequent chapter. These themes indicate certain professional dispositions, in terms of the values, beliefs and attitudes espoused or enacted.

Becoming a teacher

Despite their cultural and ethnic diversity, all four teachers interviewed came from middle class backgrounds, with parents in professional job roles, and all had explored some radically different career paths prior to teaching (accountancy, fashion procurement, management consultancy and semi-skilled engineering). Following barriers to their initial careers of choice, every teacher ‘fell’ into the profession out of convenience, after identifying a subject-specific strength in themselves (#1 had the “IT skills”, #4 and #6 were good at maths and #7 was recruited through Teach First, which is particularly geared towards ‘exceptional graduates’).

Teachers were frank about their reasons for becoming teachers. #6 admitted becoming a teacher because they were good at maths, their parents were teachers and they had been unable to fully qualify as an engineer due to restrictive race-based selection and recruitment policies in South Africa. #7 also gave a genuine “good question” response to this, echoing the ‘usual Teach
First reason’ of not really knowing what to do after graduating. #1 became a teacher in Further Education (a sector which previously benefited from considerable government investment, and which had been drastically stripped of funding since) because they had the skills and needed a steady job as a single parent. #4 did not want to pursue accounting as their specialism was “too boring” and since they did not want to take up unpaid work experience, they taught older students in a private tuition centre and enjoyed it.

Although all four teachers were also predominantly teaching mathematics, pure mathematics was not an explicit academic specialism for any of them, and this subject specialism varied considerably. In order of ‘most mathematically proficient’, their highest qualifications were their undergraduate degrees except for #4. #4 had a bachelor’s in accounting and a master’s in finance and investment, #6 studied the ‘Industrial Arts’ (practical applications of engineering and graphics design), #7 studied Business Economics and #1 studied Fashion and Business. #1, who would not be considered proficient in mathematics, would probably struggle to secure a pass (Grade 4 now, Grade C previously) in the GCSE Maths Foundation paper, and had almost found themselves teaching the subject by decree.

With #4 having grown up in Kuwait and #6 in South Africa, both of their general schooling was ‘more mathematically inclined’ in that the level of content they studied in school was higher and more challenging. Considering their migratory status, they might also have been more attracted to schools as a familiar milieu in which they already considered themselves highly skilled. Again, this might have also applied to the ‘exceptional graduate’, #7.

Future in teaching

None of the teachers revealed any specific future career ambitions nor were they taking any steps to actively pursue any lines of promotion, with #4 and #6 both stating they wanted to carry on with their current level of responsibility as they were comfortable just teaching. #1 similarly wanted to maintain their current position as Head of Year but articulated that they were “at the mercy” of the school’s needs, despite not having taken many steps to upskill themselves in a
while and knowing that they should be doing so. #7 was still undecided about teaching and gave a very unclear view of their future: attracted to the “city lifestyle” led by their friends but likely to take a job at a “less stressful school”. Despite their non-demonstration of ambition, I had had discussions with each of these teachers regarding additional responsibility and promotions at the Academy: #6 was considered experienced and with potential leadership qualities, #1 was recommended to their Head of Year role and continuously supported with additional responsibilities, #7 was recommended for an additional responsibility both as a retention incentive and in recognition of their skills and #4 was being trained to take up additional responsibility in the department, as the second most experienced A-Level maths teacher. These were considered the best teachers in the department, with potential to take up additional responsibilities, but they did not seem overly enthusiastic to do so. This is something a particularly talented teacher expressed to me before: “I wouldn’t want to do what you do because you do too much”. Perhaps the level of additional stress brought on by the additional responsibilities was not deemed to be proportional with the renumeration or recognition.

Support

Three of the teachers could also mention specific individuals who supported them during their formative years, with #6 wishing they had had such an individual at the Academy. #4 drew inspiration from their mentor that academic year, and this person was said to have also played a large role in getting them to stay in teaching.

All teachers expressed their initial teaching experiences (#1, #4 and #7 were specifically commenting about the Academy and #6 meant their first English school, with similar socio-economic demographics) were “intense”, regardless of prior experience (all of them had already taught by this point, in different educational settings). This is in line with my own experience and that of the SLT member also interviewed, who further commented that this was due to “having to learn too many systems”.

Put by #6 [when they were a Head of Year] as:
What put me off was the inconsistency in terms of senior leadership. One SLT will say one thing, someone else will say another. When you have conflicting feedback, it’s more of a challenge. Everything was pushed onto me and I did it, but you need to have that support. And I didn’t have it. It becomes frustrating after a while and I felt undermined, and if it’s not there, you feel the lack of support and not heard.

Support was given and received in a personal manner: people were supporting each other because they did not feel supported by the broader structures and systems.

The culture of the department

As well as being supported by individuals, there were clear allusions to a feeling of being supported by the mathematics department. Summarised by #1 as: “we discuss things as a faculty—we’re very faculty-led and very supportive. When I listen to others’ stories, you can see why they’re envious and jealous of our department.”

Described by #4 as:

It was a ‘make or break’ situation [when they joined] – if it weren’t for the way our department works, especially how people judge you and how nasty they can behave [#4 was shouted at by a member of SLT in front of their class and supported by this author through the emotional hurt and official lines of complaint], it hurt my ego… If it weren’t for you guys, I feel I would never have been able to achieve the things I have achieved now. The department never made me feel dumb, only as a joke! You guys never actually put anyone down and there is someone there to help. If I was doing something wrong, no-one is going to make you feel bad or tell you off (that would have affected me emotionally because I tend to carry things around with me). The family support is there in the department, and I really appreciate it. I tried to remind myself of this when I felt there were things I wasn’t able to do. When I was missing a deadline, people were there to help. I have asked [the author] and [#6] for lessons which I felt were good and I wanted to use the resources with my students.
You step into a classroom, they’re just looking at you, you’re a stranger, they [the students] don’t know you, they don’t have any respect for you, so what can you expect? But now, I am known in the school, either the students know me or through their friends.

#6 also mentioned “liking” the department and feeling consulted within it. These two teachers’ friendship groups within the Academy were within the department whereas those of #1 and #7 were more cross-departmental and this perhaps affected this feeling of collegiality which #4 and #6 identified with. Most importantly, the implicit support provided through the freedom to make mistakes was valued, perhaps even more than the explicit support provided through advice and guidance.

**Freedom, collaboration, and influence**

None of the teachers felt they were able to influence general policy and practice within the school more broadly, although #1 could recall specific instances when their recommendations were taken on board, with regards to logistical or administrative matters. Whilst #1, #4 and #7 all mentioned #6 and myself as sources of support and people they regularly collaborated with and I was mentioned as someone who would allow influence on wider policies and strategies, although this was not specific to maths teaching and learning structures. Indeed, the deviation of the conversations away from the development of their pedagogic and subject knowledges in general, indicated that these were not necessarily priorities for the teachers.

A clear line was drawn at this point in that teachers clearly did not perceive the broader school or leadership team (outside of the department) as a source of support. In terms of communities of practice, they did not identify with the Academy’s broader teaching team, which could not be defined in terms of common values or practices.

**Useful professional development**

Everyone mentioned this was generally “not useful”, that they did not use the teaching and learning ‘theories’ in their teaching but appreciated the more practical session. For #1, this was interpreted as learning how things work at the Academy (admin, IT, etc) and for #7 this was
specific behaviour management or subject-specific strategies. As expected, ‘general pedagogy’ was not found useful and #4 would prefer “something practical that actually helps me deal with my day-to-day teaching”. #6 summarised the shortcomings as: “I think it should be more focused on what the needs are. A lot of training is what Ofsted wants, not what the actual teacher wants [...] They should consider the strengths and weaknesses.”

As a new teacher, #7 also benefited from exam-specific training delivered by exam boards, designed to enhance curriculum knowledge, and was particularly inspired by a ‘cognitive science’-led maths subject training which enabled them to develop their student perspective. Casual references were made to books and websites by other teachers, but nothing substantial in terms of professional development. From mentoring them, I know that #7 was particularly proactive with regards to pursuing external developmental opportunities, which they mostly sought out themselves but were also enthusiastic to be signed up to.

**Developing practice**

#1, #6 and #7 all indicated they mostly evolved their teaching from ‘learning from personal experience’; as highly reflective practitioners, #6 and #7 had both been observed to have considerably adapted their practice for particular classes. Similarly, #4 “tried many different things” based on advice and feedback from other teachers, until they found things which worked for their challenging classes/students. #1 was less able to give examples of specific strategies they had developed and based on observation, their teaching had been found to lack a general cohesion towards broader goals, across both maths and business (their actual subject of expertise).

The approach to developing teaching was less focused on broader beliefs and values and more geared towards the adoption of specific strategies. The notable difference was #7 who was still developing their belief system for their teaching of mathematics, which they were basing around “a cognitive/memory approach to teaching”. I recall experiencing something similar when I first started teaching, in relation to “mathematics mastery”. Certainly, some teachers will be more open
to these (vaguely theoretically informed) pedagogic approaches, perhaps based on their deeper perceptions about academia and its relation to their practice.
PART V.
DISCUSSION
8. How can Lesson Study be Adapted to Meet Professional Development Needs?

The action research cycles elaborated in the previous chapter required a clear interpretation of lesson study, which then had to be contextually appropriated and critically evaluated. These three aspects of the practical research question (the title of this chapter) are now explored, to contribute to the improved practice of lesson study.

8.1. The Emergent Causal Properties of Lesson Study

Lesson study was initially defined in terms of its causal properties, in Section 5.2.

Conceptualising Teacher Change. The definition from Table 5.1 is now extended to posit a “theory” of lesson study, based on the empirical findings:

<table>
<thead>
<tr>
<th>Component</th>
<th>Meaning</th>
<th>Application to lesson study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensation</td>
<td>Concrete experiences</td>
<td>Lesson study elements (e.g., pre-lesson discussions, producing a lesson plan, interviewing students, etc.)</td>
</tr>
<tr>
<td>Concept</td>
<td>Words associated to events to distinguish them</td>
<td>Lesson study phases of putting the team together, framing the research focus, the teaching and observation cycle, the research lesson and reflection and dissemination of findings.</td>
</tr>
<tr>
<td>Construct</td>
<td>Clusters of concepts</td>
<td>A lesson study cycle involving all five phases, resulting in the development of aspects of teacher knowledge.</td>
</tr>
<tr>
<td>Proposition</td>
<td>Expression of relationships among several constructs</td>
<td>Applying the lesson study methodology develops elements of teaching (research-based teaching strategies and solutions developed through collaborative design) and enables teachers to refine existing or to develop new pedagogic dispositions.</td>
</tr>
<tr>
<td>Theory</td>
<td>Final abstraction: a statement of the relationship amongst propositions</td>
<td>The lesson study disposition: teachers apply self-efficacy to modify operational procedures or organisational structures, within a culture of collaborative enquiry.</td>
</tr>
</tbody>
</table>

Table 8.1. The emergent causal properties of lesson study (finalised)

In support of the proposition above, it was found that teachers can develop their teaching through lesson study in both phases of the research. This type of change was personal to the teacher: internal in terms of their thoughts and dispositions and external in terms of empirically observable aspects of their practice. Further to this, a broader “culture of collaboration” was often
referenced in terms of a collegial and supportive climate within the mathematics department (and
by contrast, not necessarily outside of this team). The teachers’ ‘spheres of influence’ were also
limited to this team, such that teachers felt they could only influence structures or operational
procedures within the department. Thus, this final abstraction captures the so-called “spirit of
lesson study” in action, as the ultimate desired outcome on the group of lesson study participants.

If culture is an objective phenomenon, or a “cultural system”, then it consists of normalised
behaviours and tacit knowledges, reinforced verbally and through actions. Changes to the
“cultural domain” also form part of the social morphostatic/morphogenetic cycles. This has been
framed as a disposition, as a mediating link between structure and agency (as defined in Section
5.2), i.e., as a means of conceptualising the means through which actors internalise the external.

Having previously struggled to conceptualise teacher change solely through self-efficacy
(explained in Section 7.1.4. Evaluation), the latter can now be conceptualised as the main
psychological disposition which propels teachers to act following their engagement in thought-
provoking professional development activities. Whilst this could not be quantified through the
TSES, it may explain the lack of initiative of the older teachers who may have found their self-
efficacy eroded just as much as the younger teachers found theirs reinforced through a more
intense professional development programme.

Similarly, the supportive individuals and cultures referenced by most of the teachers cannot
be linked to the practice of lesson study directly. Instead, a more ethereal “lesson study
philosophy”, here referred to as a “lesson study disposition” is used to capture the overall
approach which enables teacher development in an emancipatory, collaborative, or internally
transformational manner. The term ‘disposition’ is used in reference to the underlying values,
principles and attitudes which underpin a particular (broad) set of empirically observable
behaviours. For example, a self-efficacious teacher might be reflective of their mistakes and
reactive to student behaviours or responses. Depending on their level of authority, they might also
be able to influence broader structures or the practice of other teachers within a school. However,
none of the above would be the ‘lesson study disposition’ if not enacted within a culture of
collaboration and practice-based enquiry. Such a teacher would therefore also consider and/or consult their colleagues. Such change would therefore materialise as modified operational procedures (routines, ways of teaching and other day-to-day instructional practice towards students) and/or organisational structures (policies, schemes of work, lesson plans and other resources used to support teaching). This lesson study disposition has been referred to by others (“the spirit of lesson study is supporting each other as professionals and building bonds with hearts and minds – finding excellence of each child and each teacher” (Wood & Sithamparam, 2015, p. 44)) but it can now be specifically mapped to objective elements in schools.

8.2. Leading Professional Development from the Middle

Critical realist requires us to accept that entities hold various sources of power and that these powers may be intrinsically possessed, exercised, or actualised (in this instance, the ‘emergent causal powers’ of lesson study). The actualisation of these powers is dependent upon the counter-acting powers within the open systems in which the lesson study is situated. Much has already been laid bare about the systems and pressures within the school in question, as well as the mechanisms through which the powers of lesson study could be actualised. Crucial to this definition of power, is its intrinsic empowerment of the researcher of sociological phenomena to elevate their methods of analyses beyond the most positivist or constructionist approaches whereby “things either are, or are not”. Thus, we do not simply detail the ‘outcomes’ of an event, but seek “a better and causally accurate, correct, or reliable explanation for these patterns of events via the development of more adequate accounts of the powers, entities, and mechanisms which created them” (Vincent & Wapshott, 2014, p. 9).

The power and authority of the government (exercised through organisations like Ofsted and the Department for Education through structures like exams and league tables) on the Academy is wide-reaching and has been much discussed in the Context. The structures the Academy puts in place can be perceived as means of yielding to or mediating the effects of these powers onto teachers and students. Similarly, within the social strata lesson study finds itself in, the mathematics department, with myself at the helm, can further yield to or mediate these effects.
Ultimately, each one of the entities finds themselves constrained within this system (even the government, through the feedback loop of democratic practices, finds itself back at the mercy of its people). Thus, I attempted to enhance the mechanisms which actualise the powers of lesson study, both in response to the demands of the complex and interlinked socio-cultural systems and for the purpose of professional development.

Lesson study in its predominant or ‘classical’ form, could not surmount the barriers it faced; it needed serious adaptation to my context to enable it to fully realise its emergent causal powers. In response to this finding, an extension was designed, rather than changing elements of lesson study implementation, other professional development mechanisms were introduced to combat contextual constraints. The resulting Proactive Professional Development programme was also meant to counter the grossly ineffective existing forms of ‘Continuous Professional Development’ existent in most English schools: a passive form of arbitrary knowledge transmission followed by shallow and inconsistent intentions of implementation. In contrast, PPD is constructed symbiotically with the context, and applies lesson study’s core principle of collaborative enquiry whilst formally acknowledging the other equally important professional development practices required for truly effective continuous teacher development.

Unlike most transplants of lesson study outside of Japan, I did not seek to make any modifications to its constructs but to extend the ‘philosophy’ (or ‘lesson study disposition defined in Section 8.1) to broader professional development practices to enable lesson study to take place more effectively. This was also a response to the more urgent professional development needs uncovered which had to be met first and foremost, in the spirit of collaborative enquiry of lesson study, and in so doing, provide the teachers greater autonomy over the evolution of their practice.
Structural and cultural factors were re-classified as constraints or enablers relative to their powers on the “human project” (any series or course of action someone decides to undertake for any purpose they define) of professional development at hand. Enablers are congruent with the project, constraints are incongruent. Most importantly, since “agents have to respond to these influences” and these factors become constraints or enablers by virtue of their relationship with the agent’s “personal emergent properties”, then they are defined as such in that particular context for that particular person (Archer, 2003). It was not enough to account for the organisational constraints encountered in Chapter 2; the individual needs of the teachers also had to be considered. Having identified some constraints in Phase 1, a series of enablers were intended to counter them, through the broader approach of PPD. By the same logic as the
emergent causal properties of lesson study, aspects of Proactive Professional Development can also be delineated into layers to form a similar extension of the framework from Table 8.1:

<table>
<thead>
<tr>
<th>Component</th>
<th>Application to lesson study</th>
<th>Application to PPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensation (Concrete experiences)</td>
<td>Lesson study elements (e.g., pre-lesson discussions, producing a lesson plan, interviewing students, etc.)</td>
<td>PPD implementation strategies: (i) Personal Development Plans (ii) Lesson Study (iii) Mentoring</td>
</tr>
<tr>
<td>Concept (Words associated to events to distinguish them)</td>
<td>Lesson study phases of putting the team together, framing the research focus, the teaching and observation cycle, the research lesson and reflection and dissemination of findings.</td>
<td>PPD strands of Professional Development: (i) Developing self (ii) Developing teaching (iii) Developing people</td>
</tr>
<tr>
<td>Construct (Clusters of concepts)</td>
<td>A lesson study cycle involving all five phases, applying collaborative enquiry to improve aspects of teaching.</td>
<td>The Proactive Professional Development framework constituting of the three strands, to support teacher development.</td>
</tr>
<tr>
<td>Proposition (Expression of relationships among several constructs)</td>
<td>Applying the lesson study methodology develops elements of teaching (research-based teaching strategies and solutions developed through collaborative design) and enables teachers to refine existing or to develop new pedagogic dispositions.</td>
<td>The Pro-active Professional Development framework provides the structures to support teachers to: (i) formulate their objectives and evaluate their practice (ii) apply the Lesson Study methodology to the co-development of elements of teaching and the refinement/development of pedagogic dispositions (iii) refine specific skillsets or aspects of their knowledge</td>
</tr>
<tr>
<td>Theory (Final abstraction: a statement of the relationship amongst propositions)</td>
<td>The lesson study disposition: teachers apply self-efficacy to modify operational procedures or organisational structures, within a culture of collaborative enquiry.</td>
<td>The PPD framework: teachers are supported in designing and implementing solutions in response to their specific sets of challenges and goals, and in continuous pursuit of professional evolution.</td>
</tr>
</tbody>
</table>

Table 8.2. Unified frameworks of Lesson Study and Proactive Professional Development

To support the thinking process of other middle leaders wishing to develop their own version of PPD, a ‘Middle leader’s guide to nurturing excellence’ (see Appendix C.2) provides some guidance and practical means of assessing contextual needs through simple reflective tools like SWOT analyses.

Phase 2 of the case study explained the diversity in engagement with the PPD framework through its anticipated scenarios: teachers who felt supported were best able to engage with development practices and although they might not express changes to their dispositions or
beliefs, teachers might still modify elements of their practice (indicating previously neglected incongruences between practice-beliefs), or vice versa. This was also in line with broader critical realist concepts of obviating or facilitating the powers of entities.

My observations and the teachers’ comments noted in Phase 2 generally support the implementation of the Proactive Professional Development framework, with regards to the support structures offered through purposeful mentoring. Lesson study, on the other hand, was not explicitly credited as having contributed much to either the students or the teachers and certainly did not affect the teachers’ propensity towards problem-solving or groupwork (the types of learning the lesson studies were centred on) as far as lessons were observed.

A deep understanding of the backgrounds and needs of the teachers was necessary to design effective capacity-enhancing professional development ‘enablers’ which fitted within the broader structures and cultures of the school. This integrated and responsive approach to professional development is precisely that which is lacking in the current CPD programmes of many schools.

8.3. A Realist Evaluation

With the findings and themes of the previous chapter in mind, one can now go beyond the ‘social’ aspects of lesson study and PPD to employ a technique for realist evaluation which maps these relational structural and external elements to create certain configuration patterns in an attempt to begin to establish causality amongst the identified mechanisms. Accepting PPD (and lesson study within it) as a set of “sophisticated social interactions set amidst a complex social reality”, it therefore meets the requirement for the application of the Pawson and Tilley’s (2004) method of analysis, which applies four lenses to explain and understand programmes on a granular level:

1. **Mechanisms** are “the ways in which any one of the components or any set of them, or any step or series of steps, bring about change” such that they “pinpoint the ways in which the resources on offer may permeate into the reasoning of the subjects”. These have been extracted from Table 8.2 above.

   (M1) Personal Development Plan
(M2.1) Lesson Study – collaborative lesson design
(M2.2) Lesson Study – delivery of ambitious lesson
(M2.3) Lesson Study – observation and post-discussion of lesson
(M3) Mentoring

2. For a given possible short-term positive outcome (A), one can subsequently formulate an antonymous negative outcome (B), based on contextual factors (C). These may or may not transcend into the broader long-term outcomes (O), which may or may not be desirable.

(A1) lesson study is free-flowing democratic exploration whereby all teachers’ views are given equal weight

(B1) One or a group of individuals impose their views/agendas through lesson study

(A2) lesson study enables more knowledgeable teachers to pass on aspects of their teacher knowledge

(B2) lesson study exposes knowledge gaps which cannot be resolved

(A3) Teachers consider lesson study a worthy time investment in their professional development

(B3) Teachers find lesson study time-consuming and consider it ineffective

(A4) Teachers feel supported and able to engage in the professional development practices

(B4) Teachers are overly challenged and/or under-supported, therefore unable to engage in the professional development practices

(O1) Refined/new teaching resources

(O2) Refined/new organisational structures

(O3) Modified teaching strategies

(O4) Improved teacher self-efficacy

(O5) Improved aspect(s) of teacher knowledge

(O6) Refined pedagogic dispositions
(O7) Culture of collaborative enquiry

(O8) Limited/no learning

3. **Contexts** then become the enabling and constraining characteristics of the participants, environment, and cultures these outcomes exist within: “*what is contextually significant may not only relate to places but also to systems of interpersonal and social relationships, and even to biology, technology, economic conditions and so on*”:

(C1) Teacher Development Capacity\(^\text{16}\) which can be immediately restricting:

(C1.1) Reflective capacity

(C1.1.1) Objectively defined through socioeconomic situation, health, and free time

(C1.1.2) Reflexively defined through the ability to process these factors in relation to personal goals

(C1.2) Teacher disposition towards professional development as defined by the proactive-passive stance spectrum

(C2) Aspects of teacher identity which can be restricting both in the short and long terms:

(C2.1) Short-term goals

(C2.2) Long-term aspirations

(C2.3) Self-efficacy

(C2.4) Dispositions

(C2.5) Beliefs

(C3) Organisational culture, sub-cultures, and climate

(C3.1) Organisation’s aims and objectives

(C3.2) Structure and style of leadership

(C3.3) Inter-organisational dynamics (local council, Academy Trusts, etc)

\(^{16}\) Extensively defined in Chapter 9, but included here for completion of the evaluation
(C3.4) Interpersonal relationships and politics

The assumption is that some contexts are more desirable than others (e.g., a proactive stance over a passive stance toward professional development practices) and certain “institutional arrangements” (objectives, policies, culture, etc.) can illicit these desirable contexts. As such, the above represents a taxonomy of the constraints and enablers which have been the topic of much discussion throughout this work.

4. Then we begin to formulate outcome patterns as the “intended and unintended consequences [of programmes], resulting from the activation of different mechanisms in different contexts”. Hard distinctions between outputs (“intermediate implementation targets”) and outcomes (“changes in the behaviour targeted”) are not necessarily made at this stage.

Pattern P1 at Midlands Secondary School during the Y7 Algebra Learning Study

(October 2015)

An (1) externally sponsored series of lesson study exploring the (2) key concepts underpinning students’ foundational knowledge of algebra and internally led by a (3) somewhat hostile teacher in a relative position of power over the rest of the team. The (4) class structure was artificially constructed for the purpose of the Public Lesson and students’ previous knowledge of algebra was ignored. With extreme emphasis on the (5) pre-lesson planning phases as well as the (6) public lesson, (7) no further actions followed the post-lesson discussion.

Pattern P2 as lesson study is implemented through the Teaching Trios programme at the Academy (2016-2018).

A school-wide initiative introducing lesson study was (1) shallowly informed and somewhat misguided, resulting in (2) low buy-in from many teachers. Many perceived it as a (3) drain on their time and energy and chose to (4) de-prioritise it in favour of other activities perceived as more useful/important/necessary. This resulted in (5) limited learning from the lesson study and (6) very little/no long-term change in beliefs, practices,
or strategies. Exceptions could be found in the form of (7) teachers who did buy in to the process and (8) tried to engage with it in a meaningful manner, perhaps even (9) making some lasting operational changes as a result of their lesson study.

Pattern P3 observed through Phase 1’s lesson study implementation at the Academy (2018-2019)

A series of lesson study with a varying group of six teachers was focused on (1) improving the problem-solving skills of students and resulted in (2) the creation of sets of resources as well as their (3) inclusion in the Academy’s mathematics department’s scheme of work. (4) Heavily led by the researcher, the (5) engagement of teachers varied based on their (6) personal profiles and was found to be particularly restricted by the (7) neglected diverse needs for support of the teachers, in line with the (8) workload demands of the (9) organisation.

Pattern P4 observed through Phase 2’s Proactive Professional Development framework implementation at the Academy (2019-2020)

A (1) framework to support the developmental needs of four teachers was introduced to ‘prime’ them for more effective participation in lesson study. Teacher #1 was found to be the (2) least supported, as well as experiencing the most negative external influences on their capacity. Despite this, they were (3) active in meetings they were able to attend, drawing upon their long and broad experience of the education sector. Teachers #4 and #7 were both (4) well-supported within the school, with the latter demonstrating a (5) more active stance to their professional development, despite the good subject knowledge of #4. Teacher #6 was the most experienced but (6) least likely to initiate changes to their practice despite their ability to reflect deeply. All four teachers (7) pursued opportunities for career changes, based upon their (8) long-term goals and in line with the (9) organisational structure’s offers, despite having expressed (10) no deep initial motivation to join the teaching profession.
As described in Section 6.4, outcome patterns “allow for a more sensitive evaluation of complex programmes”. With these in mind, a realist hypothesis grid for the research is thus presented.

<table>
<thead>
<tr>
<th>Some plausible contexts</th>
<th>Some potential mechanisms</th>
<th>Some possible outcomes</th>
</tr>
</thead>
</table>
| (C1) Teacher Development Capacity \(^{16}\) (which can be immediately restricting):  
  (C1.1) Reflective capacity through socioeconomic situation, health, and free time  
  (C1.1.1) Objectively defined through the ability to process these factors in relation to personal goals  
  (C1.2) Proactive vs passive stance towards professional development  
  (C1.1.2) Reflexively defined through the ability to process these factors in relation to personal goals  | (M1) Personal Development Plan  
  (M2.1) Lesson Study – collaborative lesson design  
  (M2.2) Lesson Study – delivery of ambitious lesson  
  (M2.3) Lesson Study – observation and post-discussion of lesson  
  (M3) Mentoring | (O1) Refined/new teaching resources  
  (O2) Refined/new organisational structures  
  (O3) Modified teaching strategies  
  (O4) Improved teacher self-efficacy  
  (O5) Improved aspect(s) of teacher knowledge  
  (O6) Refined pedagogic dispositions  
  (O7) Culture of collaborative enquiry  
  (O8) Limited/no learning |
| (C2) Teacher identity (which can be restricting both in the short and long terms):  
  (C2.1) Short-term goals  
  (C2.2) Long-term aspirations  
  (C2.3) Self-efficacy  
  (C2.4) Dispositions  
  (C2.5) Beliefs |  |  |
| (C3) Organisational culture, sub-cultures, and climate  
  (C3.1) Organisation’s aims and objectives  
  (C3.2) Structure and style of leadership  
  (C3.3) Inter-organisational dynamics  
  (C3.4) Interpersonal relationships and politics |  |  |

Table 8.3. Realist hypothesis grid for Proactive Professional Development (with lesson study)

5. The final step in the realist evaluation process is to identify **Context-Mechanism-Outcome pattern configurations**, “bringing together mechanism-variation and relevant context-variation to predict and to explain outcome pattern variation”.

Thus, Pattern P2 can be found to have had two distinct configurations:
Pattern deconstruction | Pattern Configuration A
---|---
A school-wide initiative introducing lesson study was (1) shallowly informed and somewhat misguided, resulting in (2) low buy-in from many teachers. Many perceived it as a (3) drain on their time and energy and chose to (4) de-prioritise it in favour of other activities perceived as more useful/important/necessary. This resulted in (5) limited learning from the lesson study and (6) very little/no long-term change in beliefs, practices, or strategies. | (1) C3.1’s goal incongruence with Lesson Study (M2) (2) Teachers adopting a passive stance (C1.2) (3) High organisational demand (C3.2) objectively restricting teacher capacity (C1.1.1) (4) Action B3 taken in consideration of (C2.1) (5) Non-desirable outcome O8 (6) Absence of any of the 7 desirable outcomes

Pattern deconstruction | Pattern Configuration B
---|---
Exceptions could be found in the form of (7) teachers who did buy in to the process and (8) tried to engage with it in a meaningful manner, perhaps even (9) making some lasting changes as a result of their lesson study. | (7) Positive aspects of C1 and C2 overcoming negative ones of C3 (8) Engaging with M2 towards action A3 (9) Immediate outcome O1 with possibility of further desirable outcomes

Table 8.4. Pattern P2 Configurations A and B

Pattern 4, on the hand, produces three configurations for the four teachers in Phase 2:

Pattern deconstruction | Pattern Configuration A
---|---
A (1) framework to support the developmental needs of four teachers was introduced to ‘prime’ them for more effective participation in lesson study. Teachers #4 and #7 were both (4) well-supported within the school, with the latter demonstrating a (5) more active stance to their professional development, despite the good subject knowledge of #4. All four teachers (7) pursued opportunities for career changes, based upon their (8) long-term goals and in line with the (9) organisational structure’s offers, despite having expressed (10) no deep initial motivation to join the teaching profession. | (M1) Personal Development Plans and (M3) Educative Mentoring practices introduced to support (M2) Lesson Study (A4) Teachers new to the profession offered plenty of formal support structures and networks (Teacher #7 demonstrating a more pro-active stance (C1.2) Both #4 and #7 pursuing (C2.1) short-term goals, as reflexively defined by them (C1.1.2) and in line with their own (C2.2) long-term aspirations as well as the organisation’s leadership structure (C3.2). Both also develop many aspects of desirable outcomes O1-O7.

(table continues on next page)
Teacher #1 was found to be the (2) least supported, as well as experiencing the most negative external influences on their capacity. Despite this, they were (3) active in meetings they were able to attend, drawing upon their long and broad experience of the education sector. All four teachers (7) pursued opportunities for career changes, based upon their (8) long-term goals and in line with the (9) organisational structure’s offers, despite having expressed (10) no deep initial motivation to join the teaching profession.

Teacher #6 was the most experienced but (6) least likely to initiate changes to their practice despite their ability to reflect deeply. All four teachers (7) pursued opportunities for career changes, based upon their (8) long-term goals and in line with the (9) organisational structure’s offers, despite having expressed (10) no deep initial motivation to join the teaching profession.

Teacher #1 was found to be the (2) least supported, as well as experiencing the most negative external influences on their capacity. Despite this, they were (3) active in meetings they were able to attend, drawing upon their long and broad experience of the education sector. All four teachers (7) pursued opportunities for career changes, based upon their (8) long-term goals and in line with the (9) organisational structure’s offers, despite having expressed (10) no deep initial motivation to join the teaching profession.

Table 8.5. Pattern P4 Configurations A, B and C

This realist evaluation goes a step further than Mynott’s (2019) model of four outcomes and four dimensions which only classifies the outcomes in relation to the dimensions of time, collaboration, expertise, and facilitation. Bringing together the wealth of sociological factors affecting these outcomes, “the ‘context-mechanism-outcome [pattern] configurations’ describe how different components of [the] programme need to be harmonised”, in true ‘proactivist’ fashion.

In mapping the context, mechanisms, and outcomes to specific configurations, I have demonstrated a technique which appreciates the limitless fashion in which professional development programmes can be entwined with social reality, whilst also drawing clear conclusions about empirically observed outcomes. Whilst the configurations are the endpoints for this evaluation technique, the delineation of the contexts and mechanisms may very well be the
most powerful aspect. In making attempts to categorise and define these, one can begin to manipulate their effects for the purpose of achieving the desirable outcomes sought, without diluting the complexity of the social realities these programmes inhabit.

8.4. Implications for Practice

Lesson study was found to have many (geographical and formational) variants: within Japan itself, as well as the European off shoot of learning study, even Dudley’s British version, have all been adapted. Thus, there is not really such thing as ‘pure lesson study’, unless reference is being made to the original 18th century implementation. Since its forms vary, the developmental effects of lesson study range widely as well, depending on the participants and the decisions they make as they interact with its mechanisms. Some have acknowledged this in terms of “ontological differences” (Rappleye & Komatsu, 2017); I put this into practice as variance in contexts and participants’ socio-psychological make-up. My key observation of ‘lesson study in practice’ is categorically that lesson study fails to address the basic levels of needs required for transformational teacher professional development to take root. Consider social deprivation as the non-satisfaction of basic human needs, without which one is unable to rise to the higher levels of consciousness required for more complex cognitive processes and possible self and social advancements. Whilst the human spirit is immeasurably enduring, Einstein would have likely not been able to formulate his special theory of relativity if he had been born a homeless ‘street child’ in the slums of Mumbai. Whilst lesson study might be a wonderful springboard for development, it requires a foundational knowledge base and foundational support structures to be able to exercise its immense causal powers. This means that there is a preliminary ‘priming’ requirement for the application of lesson study to ‘hectic’ contexts, which can simply take the form of a contextual review or an assessment of the teachers’ capacity for development and is open to interpretation by the reviewer. My version of lesson study (as part of PPD) is not necessarily going to work for every school, or indeed any other school other than the Academy, nor does it aim to. The process I applied to design my overall professional development framework might be more helpful than the product itself.
In the figure above, the grey pyramid represents existent professional development structures, whereby reactive ad hoc support systems are mere bandages on a haemorrhaging structure, lesson study/professional development is squeezed into the middle and values are not actually valued. What is required is effective professional development mechanisms like lesson study sitting on top of value-driven practice embedded in strong support systems.

If the purpose of critical realism is to explain and improve the social world, the purpose of lesson study is to explore concepts in context to improve teaching (and learning). Lesson study possesses the power to change teaching, regardless of whether these powers or changes are exercised. Without an innate desire to explore the theoretical aspects of teaching, lesson study is just a bunch of people talking and spending a disproportionate amount of time planning a single lesson. As a basic requirement, lesson study needs willing participants with enough time to engage in it. To be fully actualised however, contextual constraints must not overpower the lesson study.

Secondly, lesson study assumes a level of homogeneity of beliefs and motives. Not every teacher is deeply motivated to teach. Not every teacher wants the best for their students. Not every teacher wants to develop their skills. To pretend otherwise, is to blindsight oneself. Observation, reflection, and simple direct action might be more effective than the most powerful cycle of lesson study, if this is more appropriate to the needs of the individual or team, if the group dynamics are deeply problematic or if one singular teacher is knowledgeable or skilled enough.
Thus, lesson study does not work when there is an unresolvable incongruence between the needs of the participants and the affordances of lesson study, limited time, or poor group dynamics. In moments of urgency, or in the face of rapidly evolving demands, one cannot indulge in the time-consuming process of lesson study. Considering severe contextual limitations, my research contributes a definition of lesson study which considers its various forms and adaptabilities, an implementation of a professional development programme extended around lesson study, adapted to the needs of my context, as well as the first realist evaluation of lesson study. As much more than a series of steps, the notions surrounding lesson study form a wider disposition, and the latter must be adapted to its context: the inflexible approach of so-called ‘purists’ hinders the application of lesson study and for it to truly flourish, the general philosophy of lesson study must take root and it must be allowed to mould itself to the unique contexts of participants. Lesson study continues to embody professional development ‘best practice’ and is therefore crucial to the continuous development and growth of teachers, at all levels.

Through my Proactive Professional Development model, I have demonstrated “how combinations of attributes need to be in place” (Pawson & Tilley, 2004) for lesson study to be effective. The implementation schema was proposed as an “optimal alignment” of the programme, within the target group of teachers as limited by their contexts. Practically, this implementation at the departmental level only worked in conjunction with other basic support structures. Thus, a supported version of lesson study is the one proposed to be effective. This is contrary to the recommendations of some other researchers. Takahashi and McDougal (2016) for example, suggested five features required for more effective lesson study: the purpose of lesson study should be to develop expertise or learn something new (not refining a lesson), it should be part of a larger (school-wide) project, it should include significant time spent on kyouzai kenkyuu (the study of instructional materials), it should be conducted over several weeks (not a few hours) and a Knowledgeable Other should be involved in the planning and post-lesson discussion. I would simply argue what they pin ‘effectiveness’ on: if it is strictly in terms of “learning something new” then this can be very easily achieved without the attached restrictions. Indeed,
this type of generalisation encourages a narrow typecasting of lesson study, which goes against its broader aims and needlessly limits its causal powers. Lesson study can affect a range of knowledges, skills and dispositions and therefore be effective through a range of non-quantifiable outcomes.

My realist conceptualisation of lesson study, which is supported by my literature review of lesson study, professional development, and critical realism, encourages a more open approach to modifying the implementation structure of lesson study, without affecting its internal core principles. The application of such ‘open-mindedness’ to structures can be extended across the realm of developmental programme-design in general: it is not necessary for a programme to address every single need of the participants, but it must be responsive and respectful to these.

Proactive Professional Development brought together elements of mentoring as well as lesson study and along the way, similarly ‘broad in their own sense’ concepts such as teacher identity and self-efficacy were broached and borrowed from. No claims are made to have deeply explored all of these ‘tributary’ theories; concepts were simply included if they were found to be useful in answering the research questions or to help mould the practical model. Lesson study inevitably extended to professional development, as the former operates under the umbrella of the latter, although this is not often addressed explicitly in literature. Whilst lesson study is seen to strictly exist in the realm of the classroom or at the micro-level, professional development is often conceptualised at the organisational or meso-level. The missing link between the two has been widely communicated in the Japanese case, but no attempts have been made to replicate such a link, possibly due to the assumption that that is the only form it can take, perhaps due to an avoidance of diving into the mired human and contextual contexts.

This paper does not profess to have solved any major educational problems nor does it even necessarily claim to have solved the specific issues surrounding professional development. It merely proposes one particular way of doing things, starting with an established model, honestly explored across two schools and resulting in the proposal of the humble author’s learnings from
this experience. This work does not need to end with 'more research is needed' because it never assumed the work would be completed by the end of the doctorate, and indeed, a hypothetical subsequent phase of research is presented in Chapter 10. The dynamic approach in which the PPD model was developed simply continues, refining the framework as its purpose evolves. This thesis only claims to be an adequate synthesis of the research process in its most basic form as a proposal of a singular solution to a complex problem, generalisable in its forms and processes as opposed to its conclusion, which would actually be expected to be completely different in a different context. Simply put, the main aim was to design, implement and evaluate a working version of lesson study in the challenging contexts I found myself teaching in. Along the way, I found it helpful to pen my own definition of lesson study, which was extended into a framework of the emergent causal properties of lesson study, my own implementation model, which required external professional development features not offered by lesson study and culminated in a realist evaluation of lesson study, from a previously un-broached angle.

Lesson study might thus be generally more suited to projects with pedagogically oriented goals, requiring a depth of analysis from multiple perspectives, including the students’, if time allows. Whilst this might be a very noble goal, it is rather unrepresentative of the bulk of my requirements as a Head of Department in a hectic secondary school requiring extensive day-to-day management to meet specific exam-based performance measures, as well as the endless plethora of delegated tasks, demands and queries regularly delivered to my email inbox. Lesson study could not help me solve most of the challenges or issues I face as a Head of Department, and arguably, cannot directly help anyone in similar situations. I needed top-level strategies to guide the actions of my team to ensure cohesion towards our overall goals. Having inherited a fractured dysfunctional team, wherein every teacher only had the capacity to think about their own individual class in terms of its immediate needs, I now lead a well-organised one which can continue to operate based on the structures and systems I have established. I wanted lesson study to further elevate the team’s current performance level and for this system to be self-reflective and self-improving but, in the end, the motivation, self-efficacy or ability were not there. Now I am in
a position where I can try to nurture those attributes; but this stage would not have been possible
without the foundational stage I first had to impose. It is also a very precarious position hanging
in delicate balance, easily undone by a simple event like a change in staffing structures.

Much can still be learned from the processes and concepts explored, and these are now put
together as a series of recommendations for various strata of the educational landscape interested
in implementing lesson study, in any form, including but not exclusively defined through the
perspective of the following stakeholders:

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Potential lesson study focus</th>
<th>Implementation recommendations</th>
</tr>
</thead>
</table>
| Classroom Teacher            | **Pedagogy** *(1) Subject-specific issue*  
|                              | * e.g., developing algebraic thinking prior to introducing formal concepts*  
|                              | *(2) Student-specific issue*  
|                              | * e.g., developing meaningful visual multiplicative links for students with severe learning difficulties*  
|                              | *(3) Exam-performance target*  
|                              | * e.g., developing a framework to support students in answering 5-mark GCSE Foundation AO3 questions* | * Research literature and existing resources  
|                              | * Focus on the student experience, especially difficulties and misconceptions*  
|                              | * Re-iterate the lesson to evaluate the effectiveness of resources across different groups of students and different teachers* |
| Middle/Senior Leaders        | **Strategy** *(4) Addressing identified development needs*  
|                              | * e.g., developing sustainable Assessment for Learning strategies to accelerate the progress of Y11 students*  
|                              | *(5) Implementing top-down policies*  
|                              | * e.g., developing a mastery approach to the teaching of mathematics* | * Agree to shared definitions to broad terms  
|                              | * Consider a differentiated approach to generic problems by breaking them down into sub-problems*  
|                              | * Create explicitly time-stamped implementation plans (and follow-up evaluations)* |
| Umbrella organisations       | *(6) **Expertise cross-pollination***  
|                              | * e.g., designing KS1-KS2 arithmetic procedures for KS3-KS4 longevity* | * Share strengths and weaknesses openly to find common ground  
|                              | * Plan observations across separate sites if possible*  
|                              | * Consider long-term implications of findings for each organisation* |
| Policymakers                 | *(7) Developing bottom-up feedback*  
|                              | * e.g., facilitating the implementation of a mastery-approach curriculum across English and Maths* | * Include the teacher and student perspectives in high-level policies* |

Table 8.6. Recommendations for stakeholders

Importantly across all the above cases, in order for a reform to actualise its potential causal
powers, the constraints need to be mitigated against. This necessarily involves:
(i) An analysis of these constraints – as was explored through ‘Section 2.2. The Academy’ and the first phase of the research,

(ii) The design of enabling structures – as was demonstrated through the Proactive Professional Development programme,

(iii) An evaluative approach which acknowledges the competing causal powers of related entities – as concluded in the realist evaluation through the context-mechanism-outcome pattern configuration.

Applied to lesson study, within professional development, this translates into:

(i) The needs (and wants) of the teachers,

(ii) The creation or improvement of systems, policies, and tools to facilitate the aims of the organisation and individuals,

(iii) A non-rigid approach which encompasses ‘informal’ practices.

To the policymaker who seeks to create a generalised approach to professional development by ignoring the rich diversity of the landscape they serve, please don’t. Consider instead providing the analytical tools and structures to support the teachers and school leaders require to pursue their developmental needs. Exploring the context might enable specific recommendations should these capacities be lacking but most likely an alleviation of workloads and the mental and physical space to explore developmental needs and design strategies is all school leaders will need to spur their organisations on. No single report or body of work can list the potential solutions, as the latter explicitly require intellectual engagement with the processes and mechanisms presented and the idea of lifting a ‘solution’ from paper into a real-life context is a fatally simplistic approach to the misconceived ‘education problem’.

From the beginning, I set out to design a working version of lesson study (for me). In weaving my personal narrative into this research, I am not telling a unique story from a unique school. There are many schools like mine and many stories like mine. Perhaps if reformists, policymakers, and academics listened more closely, they would have better success implementing
meaningful change in schools. For how much do these outsiders really know about the schools they seek to change? This layer of the personal adds validity to the rationale: it provides a defence for my perspective, which is just as valid, and in some ways more so, than those of an external uncommitted policymaker whose decisions are directly affecting the lives of my students. These are children they do not know, in communities they have never lived in, navigating situations they do not care to unravel. I challenge anyone to mount an argument against such a defence and hope to hear more voices like mine amongst ‘serious academic research’.

Should lesson study still be considered an essential aspect of teaching? Yes, decidedly so. Everything about it still makes sense. Like an imported cuisine, we needed to adapt it to our locale. The lesson study I was introduced to is something to aspire to, like a classroom where every student is engaged, and the teacher is taking them on a wonderful educational journey. The lesson study I am promoting is realistic of the classrooms we actually teach in, with real-life teachers, not fictional characters. Real life has so many layers, it becomes easier to ignore the realities in favour of ‘generalisation’, yet it is in the layers and details that lie the solutions we seek.
9. How do Teachers Adapt Their Practice as a Result of Professional Development?

If the previous chapter was for practitioners of lesson study, then this one is for researchers of professional learning. Here, the second research question (the title of the chapter) is answered, by further abstracting and generalising the findings and analyses from the previous two chapters, with respect to Archer’s (2003, p. 130) reflexivity:

*Because they possess personal identity, as defined by their individual configuration of concerns, they know what they care about most and what they seek to realise in society.*

*Because they are capable of internally deliberating about themselves in relation to their social circumstances, they are the authors of projects that they (fallibly) believe will achieve something of what they want from and in society.*

*Because pursuit of a social project generally spells an encounter with social powers, in the form of constraints and enablements, then the ongoing 'internal conversation' will mediate agents' receptions of these structural and cultural influences.*

*In other words, our personal powers are exercised through reflexive interior dialogue and are causally accountable for the delineation of our concerns, the definition of our projects, the diagnosis of our circumstances and, ultimately, the determination of our practices in society. Reflexive deliberations constitute the mediatory process between 'structure and agency', they represent the subjective element which is always in interplay with the causal powers of objective social forms.*

By drawing on Archer’s (2007) modes of reflexivity, the idea of teacher developmental capacity codifies a teacher’s temporally defined ability to engage with developmental practices. Thus, four types of teachers are defined based on their developmental needs. From a leadership perspective, understanding the developmental capacity of teachers enables the application of the correct support and challenge structures on an individual level. At the organisational level, such supportive cultures complement the supportive structures required to increase the collective capacity of the school workforce and drive sustainable and pro-active teacher development.
In response to the research question itself, it is proposed that teachers adapt their practice as a result a double morphogenetic cycle which enables them to explore uncontested aspects of their practice through new experiences which spark reflexive deliberations leading to changes in their knowledge, skills, dispositions, or beliefs.

9.1. Teacher Developmental Capacity

What are the transformational powers of lesson study?

The effectiveness of lesson study (and other professional development practices) is predicated by a teacher’s developmental capacity. This is based on their unique constellation of objective constraints as well as their subjective stance towards engagement in developmental practices. Thus, teacher developmental capacity also forms part of the answer to the question posed on Page 108 “how do teachers resolve their (possibly) inter- and intra-conflicting beliefs and dispositions within the structural constraints of their contexts to execute their perceived notions of ‘excellent teaching’?” as a construct which maps internalised dispositional structures with regards to their propensity for actualising changes to teaching practice.

Within Archer’s (2007) classification of modes of reflexivity, the meta-reflexive mode of deliberation is that through which personal powers “have seized upon a cultural ideal and their guiding project is to come to embody and express that concern as closely as possible”. By comparison, if most people are in fact communicative or autonomous reflexives (less inclined by idealistic pursuits), then, was the transformation of teaching practice, to a certain extent, an unreasonable and maybe even impossible demand? What can we reasonably expect most (communicative or autonomous reflexive) teachers to be able to do within the realm of their “constellation of concerns”? This inconsistency in teacher attitudes towards developmental activities was first broached in terms of modes of reflexivity in Phase 2 and is now fully explored in both this section and the next.

As a teacher by nature, my approach had naturally swayed towards the tailoring of support (the personalised support structures as well as the personalised development plans of the PPD
framework) rather than enforced generic procedures. Having used specific strategies for teachers based on their needs, it would now make sense to configure the two. This was alluded to in the Teacher Profiles as a variance in the elasticity of professional development, based on the teacher’s psycho-social make-up (psychologically, this is based on their unique identity and sociologically, their unique context).

I now attempt to map aspects of teachers’ subjective and objective realities which might affect their propensity for self-improvement. In the objective dimension, reflective capacity could be unhindered, limited, or incapacitated. This was most clearly demonstrated by Teacher #1, who found their reflective capacity fluctuating from one end of this spectrum to the other, based on their changing health situation. In the subjective dimension, their stance could be proactive, active, or passive. Teachers #1 and #7 were thus proactive, #4 was active and #6 was passive, irrespective of their personal time and energy constraints. In the interesting case of #6, a highly experienced and knowledgeable teacher, this stance could be seen as very temporary, as they had experienced recent abrupt career disruption which affected their willingness to pursue further changes in the immediate feature (they were happy “just being a teacher of maths” for the time being). This stance was not generally congruent with their broader goals of career progression and was therefore more of a lag as they re-evaluated their concerns and re-determined their social projects.

This subjective dimension can be conceptualised similarly to Archer’s (2003) own identification of “different 'stances' towards society and its constraints and enablements: the evasive, the strategic and the subversive”. Her observations were specific to social mobility and not subject to any judgement or manipulation by herself, merely an attempt to make sense of her interview data. Similarly, others have argued that lesson study “presupposes what it promotes” (Law, 2013, p. 111): it aims to enhance teacher knowledge (an accumulation of subject, pedagogical and student knowledge) but it clearly requires some (teacher) knowledge to begin with. The idea is that through the application of the correct research procedures and given the right level of motivation, teachers will be able to drive their own knowledge improvement based
on whatever knowledge they do hold (not necessarily pedagogic or subject-related), and this presents an interesting perspective on the predicates to effective engagement with lesson study. For example, Teacher #7 demonstrated a highly pro-active stance to professional development, choosing to participate in multiple external courses, listen and read around pedagogic points of interest and consulting with more experienced teachers regularly for advice. This enabled them to further their pedagogic content knowledge, which was essentially zero (as they were completely new to the profession and the curriculum they were delivering) to the level where they were able to confidently deliver their lessons and even be in a position to consider mathematical instruction from a more pedagogic/cognitive perspective.

In seeking to understand the teachers’ perspectives, I was seeking to achieve a broader aim of getting them to engage more proactively with their contexts, indeed, to ‘subvert’ these contexts for the betterment of their students. Thus, Figure 9.1 below can be used to visualise these dimensions and classify the teachers within four quadrants, as per this purpose:

![Figure 9.1. A two-dimensional codification of teacher developmental capacity](image-url)
Developmental capacity draws from Archer’s modes of reflexivity but is in fact simpler: it is a codification of the teacher’s current time, energy, and baseline skills for the purpose of reflecting upon and improving, aspects of their practice. After my own attempts to adapt teacher workloads to levels of experience and responsibility, I came to appreciate that developmental capacity would also be dependent upon the perceived intensity of workload as well as external factors such as health (as was the case with Teacher #1) and personal responsibilities. The baseline skills in question, encompass basic teacher knowledge levels as (an obvious) prerequisite to developmental capacity. For example, someone with no foundational understanding of mathematics will have low developmental capacity: although not impossible, it would be quite difficult to develop this in a working environment, without considerable time dedicated to studying the subject. Developmental capacity is therefore a conceptualisation of a teacher’s particular set of structural constraints directly or indirectly affecting their current ability and willingness to engage in developmental practices.

The y-axis of ‘stance’ represents the desire to develop and the complex “*mix of emotions, attitudes and values which affect the quality of reflections and interactions*” others (Peña Trapero & Pérez Gómez, 2017, p. 76) have referred to. As discovered, some teachers, regardless of their ability to teach, are not deeply motivated to do so (this is not meant as a judgement against those teachers, as they would have prioritised their motivations based on their specific constellation of concerns). They may simply aim to ‘get by’ delivering prescribed lessons and doing their job with as little discomfort as possible. Such an approach to work probably results in less stress for these individuals and they might lead more fulfilling lives as a result, dedicating their time and energy to self-care, family, or hobbies. However, this does not negate their ability to develop or adapt; they have chosen not to engage despite having the technical abilities to do so. These have also been theorised as “*positive dispositions for teaching*” (p. 71). Whilst dispositions are general traits of a person’s character, based on their beliefs and values, their stance would be their specific disposition towards professional development practices. The choice of grounding professional development practices upon dispositions (which draw from beliefs but are not necessarily
consistent with them) as opposed to broader values is another pragmatic decision: such values
could be considered “too abstract for conceptualisation, particularly at this educational level” (p.
72), certainly for my research purpose.

Thus, four rough ‘types’ encapsulate the manifestations of these two dimensions but in
themselves do not dictate the true ‘nature’ of any teacher. Rather, they might influence the types
of professional development practices best suited for these teachers. For example, Teacher #4’s
developmental needs could be broadly categorised as Type 2: they were inhibited by their low
energy levels due to their long commute but often demonstrated the desire to improve and try new
things. As such, their enthusiasm could be fostered but over-exerting them might result in a good
and effective teacher becoming ineffective.

In general, the different types could be supported and challenged in different ways, for
example:

<table>
<thead>
<tr>
<th>Developmental capacity</th>
<th>Support required</th>
<th>Challenge required</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Highly self-efficacious</td>
<td>Building shared goals through the Personal Development Plan (PDP)</td>
<td>• Leadership of lesson study</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-guidance of their professional development</td>
</tr>
<tr>
<td>(2) Motivated but inhibited</td>
<td>• In-depth discussions of PDP</td>
<td>Gradual ownership of projects (including lesson study)</td>
</tr>
<tr>
<td></td>
<td>• Basic coaching/mentoring</td>
<td></td>
</tr>
<tr>
<td>(3) Unmotivated yet capable</td>
<td>• Clear targets through the PDP</td>
<td>Co-opt onto projects whilst safeguarding autonomy</td>
</tr>
<tr>
<td></td>
<td>• Acknowledgement of skills</td>
<td></td>
</tr>
<tr>
<td>(4) Extremely challenged</td>
<td>Regular mentoring to identify priorities and continuously offer support</td>
<td>No additional challenges – this teacher is already at the limit of the developmental capacity</td>
</tr>
</tbody>
</table>

Table 9.1. Support and challenge structures required based on developmental needs

“Emotions influence our spontaneous reactions, our way of thinking, our recollections, the
decisions we take, how we plan the future, our communication with others and our way of
behaving” (Peña Trapero & Pérez Gómez, 2017, p. 76) and although they feel alien in academic
research, they should clearly be given greater consideration with regards to intentions to change
systems constituting of human elements, like education. It is a fallacy to base research designs on
the assumption that humans behave rationally, when our life experiences clearly demonstrate that
we are emotional creatures of habit for the most part. Importantly, this concept of teacher
developmental capacity affords importance to the “*implicit, habitual, automatic components, loaded with emotional tonality, which substantially shape our conduct*” (p. 66) and provides a practical means for professional development programme developers to understand the contextual needs of their subjects. Conversely, the lack of initial consideration towards these developmental needs is likely to have been a major determinant of failure of many such programmes, particularly in capacity-challenged contexts.

### 9.2. Sustainable Development Programmes

*How should we conduct impactful lesson study in varying contexts?*

School leaders need to improve teachers’ developmental capacity by creating supportive structures and cultures which recognise and address their diverse professional development needs. A holistic and context-specific approach, such as the one presented, is necessary for sustained teacher development.

When Shulman (1987) began to formulate the various aspects of teacher knowledge bases, he postulated this could be categorised as a ‘minimum’ of seven (see ‘Section 4.2. Theories of Professional Learning’). Whilst lesson study is posited to engage most of these knowledge bases, “*improvement of teaching requires substantial, ongoing effort by teachers, who must integrate innovations into the complex juggling act of classroom practice, so improvement efforts must elicit and maintain educators’ motivation for this ongoing work*” (Lewis & Perry, 2017, p. 262). The continuous disconnect, or lack of coherence, amongst policies, assessments, organisational routines, even the curriculum and ‘what is considered best’ (itself a contextually and personally informed dynamic concept), finds teachers constantly caught in the tangle, with teacher knowledge always struggling to keep up. This was an important aspect of what PPD tried to resolve.

It did also seem that these knowledges were given an implicit ‘priority ranking’ based on the demands of teaching at the Academy. Knowledge of the curriculum and of students were prioritised as the former is key to exam success and the latter is crucial in navigating complex
behaviour management structures and cultures (at the Academy). General pedagogic knowledge and knowledge of the subject matter were the next priority as they translated to general classroom management and the ability to motivate students respectively. Therefore, at the bottom of the priority list, we found pedagogical content knowledge and certainly scraping the barrel, knowledge of educational aims. Since both are the key to ‘deep’ lesson study, it is not surprising therefore that teachers did not consider lesson study as useful: it addresses aspects of their teaching which they might consider too far removed from the practical necessities of their job.

My data suggested that my Phase 2 anticipated scenario about pre-requisite knowledge being required to engage with lesson study was incorrect. This led me to consider other forms of pre-requisites. As well as certain dispositions such as self-efficacy, certain meta-cognitive skills might favour better outcomes of lesson study, and indeed, general attitudes towards change. In contrast with meta-cognitive knowledge which constitutes “the declarative knowledge one has about the interplay between personal characteristics, task characteristics and the available strategies in a learning situation”, meta-cognitive skills are gaining popularity in the ‘edusphere’ as “the procedural knowledge that is required for the actual regulation of, and control over one’s learning activities” (Veenman et al., 2004, p. 208). “Task analysis, planning, monitoring, checking, and recapitulation are manifestations of such skills”, and these are often the skills that high-attaining students use to secure good grades, and generally tend to accompany academic and career achievements.

Similarly, since “effective professional learning attends to these core issues of knowledge, motivation, and coherence” (Lewis & Perry, 2017, p. 263), teacher motivation and desire also seemed to be of more importance than previously assumed. None of the teacher participants set out on clear career paths directly oriented towards teaching. That is not to say that they do not want to teach, but it was certainly not the first choice for any of the participants. Whereas children have less autonomy in terms of what they study, teachers and adult professionals in general, are more autonomous in their development. Therefore, a source of motivation or desire might be even
more pertinent in the success of development initiatives. These sources would be drawn from the teacher’s identity and through their regular reflexive processes, both of which are quite complex socio-psychological concepts in their own right. There are so many teachers that many of us might have a family member or family friend who was a teacher, not to mention the very many teachers we each came across through our formal schooling. There is therefore a sense of security, understanding and trust about the profession (we all know numerous teachers and understand the basic requirements of the job on the surface) that makes it a safe, easy and/or viable career option. With high demand and lower entry requirements than other service professionals (doctors, lawyers, etc), it is therefore no surprise that the ‘desire to teach’ ranges, perhaps towards the low end. Thus, an over-reliance on highly motivated individuals, or ‘career teachers’ as drivers of lesson study, might be part of the reason why the idea never quite took off properly.

It is assumed in every model of professional development that there is a base-level desire to elevate one’s practice but what if one conceptualises one’s job (not profession) as a series of meaningless tasks one must perform? A desire to improve cannot really be cultivated (it must be intrinsic by nature). Whilst a lack of desire does not completely negate the possibility of improvement, it reduces the intensity of the outcomes of any professional development measures, including lesson study. Importantly, new knowledge or the replacement of a set of false beliefs, is not enough to spur change or innovation: “cognitive enlightenment is a necessary, though not a sufficient, condition of [their] emancipation” (Collier, 1998 as cited in P. K. Edwards et al., 2014, p. 12).
In creating a value-driven culture of professionality and nurturing meta-cognitive skills (aspects of meta-reflexivity), school leaders can foster a pro-active stance to professional development. In creating support structures and collegiality, they can directly increase teacher developmental capacity. Figure 9.2 demonstrates how these leadership actions (in green) can act as enablers to the reflexive discernment-deliberation-dedication processes (in blue) required to drive sustainable teacher change. The underlined psychological attributes underpin the sustained change process required to enable high-level lesson study outcomes for long-term change (Figure 6.4) and the green elements were demonstrated by aspects of PPD. The re-positioning of ‘values’ suggested by Figure 8.1 within approaches to professional development, is also included as key.

One cannot manipulate individuals into action; it may very well be that some lesson study participants did not have the capacity to develop. However, this must not be adopted as a fatalistic view, and instead capacity must be nurtured, with programme developers adopting the same growth mindset teachers are often encouraged to when faced with challenging student behaviours such as disengagement. Moreover, having internalised more of the social world around them, an adult might prove to be a less open to change. Ultimately, every teacher will be applying their own “reflexive deliberations” (Archer, 2003) to determine the best course of action for them. Respecting
the teachers as independent agents able to make the best decisions in their unique situations, the aspects underlined in Figure 9.2 become even more crucial as a means of objectively shaping the situations that the teachers confront regularly, and thus priming the teachers, instead.

If Figure 9.2 presents a means of developing teacher development capacity, then it does so with special consideration towards the level of **emotional and energy capacity** required to perform the job of teaching, particularly at a hectic school like the Academy. Whilst commitment to one’s job may not be unique to teaching, a level of ‘over-work’ unmatched by a deep commitment to the mission of teaching could certainly be partially held responsible for fatigue and turnover, alongside the increased the **cognitive load** of modern teaching approaches.

Conceptualising time as a “structuring relation of power” (Sharma, 2016, p. 134) meant that whilst teachers can hope to conduct self-led lesson studies, these cannot be sustained if not endorsed as a ‘worthy activity’ with their own facilitating structures and regular space in the much contested “72% structured time”. School leaders need to deeply question their broader educational aims to ensure that every task outside of the core practice of delivering lessons, is an enriching and efficient use of extremely precious teacher time, as they hold the power over it.

Dowling (2010, p. 19) further suggests that the issue of sustainability might be resolved through appropriate ‘recontextualisation’: “… liberal educational initiatives must fail precisely because, by definition, they ignore the transformative impact of moving between contexts that exhibit different social relations and—though arguably to a lesser degree—different patterns of cultural practice.” This is amplified by the fact that “the politicians who oversee educational reform commit two fundamental errors: believing that redesigning and replacing laws on education will change teaching and learning in schools; believing that schools and classrooms are wide-ranging but uncomplex systems which can be modified by changing some of their parts” (Peña Trapero & Pérez Gómez, 2017, p. 76).

Thus, sustained teacher development must address the issues of knowledge, motivation, and coherence:
Improvement of teaching requires substantial, ongoing effort by teachers, who must integrate innovations into the complex juggling act of classroom practice (e.g., Clarke & Hollingsworth, 2002; Lampert, 2001), so improvement efforts must elicit and maintain educators’ motivation for this ongoing work (Fullan, 2001). In addition to supporting educators’ motivation, successful innovations must surface and engage educators’ knowledge, not just impose “proven” strategies, because successful scale-up of instructional change typically requires fundamental reorganization of teachers’ knowledge and beliefs (Cohen & Ball, 2001) and active contributions of knowledge from frontline practitioners who know the setting well (Bryk, Gomez, Grunow, & LeMahieu, 2015; Fullan, 2000). A further challenge in scale-up of instructional improvement is coherence, a problem that emerges in many forms, such as conflicts among policies, assessments, and organizational routines (Spillane, Parise, & Sherer, 2011). Of most relevance here is coherence between curriculum and instructional strategies because neither component alone is likely to offer sufficient support for instructional improvement (Cwikla, 2007; Ermeling & Graff-Ermeling, 2016; Remillard, 2005; Schorr, Firestone, & Monfils, 2003). Research suggests that curriculum materials alone do not enable students to “‘learn their way around’ a discipline” (National Research Council, 2000, p. 139) and that educators must combine knowledge of specific instructional strategies and selection of the right curriculum elements to produce student learning. (Lewis & Perry, 2017, p. 262)

Effective professional development attends to the core issues of knowledge, motivation, and coherence, but must be “consistent with teachers’ knowledge and beliefs”, bridging “the gap between teachers’ current knowledge and beliefs and research-based knowledge..., changing norms about desirable instruction (Manouchehri & Goodman, 2000; Spillane, 2000), and by building educators’ inquiry, learning stance, and focus on student thinking (Sherin & van Es, 2009)” (Lewis & Perry, 2017, p. 263). Most importantly, this transformation of teaching practice is a slow and gradual process which must be afforded the time and space it deserves as part of regular professional development practice. The development of a professional development
programme aiming to nurture teacher developmental capacity was exemplified in the creation of the Proactive Professional Development framework in ‘Section 7.2. Methodology 2.0’ and can be supported through (Appendix) ‘C.2. A Middle Leader’s Guide to Nurturing Excellence’. Like lesson study, the process requires collaborative enquiry into the developmental capacity of teachers, clarification of educational goals and the design, adoption, and evaluation of structures to bridge the gap between capacities and goals.

9.3. The Double Morphogenetic Cycle of Teacher Change

*How do teachers enact change to their practices?*

Effective professional development practices, such as lesson study, support reflexive deliberations on teacher practice by drawing on existing knowledge, skills, dispositions, and beliefs in a double morphogenetic cycle which also allows exposure to new knowledge and experiences.

Professional development can be loosely defined as the engagement in activities specifically for the purpose of some sort of subjective ‘improvement’. They are subjective in that such improvements can be openly defined, variably interpreted, and comparatively disputed. For example, a teacher may decide it would be an improvement to increase collaborative spirit and subject-specific dialogue in their classroom through increased teamwork amongst students. A passing teacher might observe that this colleague’s classroom is now noisier and judge their ‘improvement’ to be a terrible idea, but the reflective process of the initial teacher and logic they employed in designing their new ‘teamwork strategy’ terms this as (proactive) professional development. It is proactive in that seeks an objective outcome (whose success can be ontologically debated, but whose reality is unquestionably realised), in pursuit of a broader educational goal.

The refinement of techniques, the discussion of contexts, the design of strategies and a collaborative stance to dissecting and solving issues *must* be at the core of teaching practice itself. This is uniquely due to the core purpose of the job: like doctors are accountable for the
physical lives of those in their care, we are accountable for the emotional and cognitive lives of those in our care. To allow outdated practices to fester or to prioritise ineffective strategies, is to fail in our duty as educators. That which others have referred to as the “essence of lesson study” or the philosophy of lesson study is not as abstract as it first seems. It is empirically observable as the ‘lesson study disposition’ (see Table 8.1) through a culture of collaboration and teachers enacting deep and meaningful changes. It is the potential outcome of the morphogenesis cycle (Figure 5.1) effective professional development programmes seek to achieve.

Having established the nature of the “internal conversation” as the reflexive deliberations free agents engage in in order to assert their powers through projects, Archer (2003, p. 16) has predicated reflexivity as the “missing mediatory mechanism that is needed to complete an adequate account of social conditioning”. The assertion of subjective powers over objective social situations thus boils down to the interplay between two sets of emergent (irreducible) properties and powers, namely structure and agency, as responsible for morphostasis and morphogenesis in society or part of it. A morphogenetic cycle made up of temporally defined phases, thus ends in “either change or stasis and represents the start of the next cycle” (Archer, 2013, p. 9).

Such a method has yet to be applied to explain teacher change; yet, given the intrinsically social nature of our work (not only do we operate in social contexts, but we aim to influence them through formal schooling), it seems very fitting. A heavily prescribed, static curriculum coupled with grade-associated performance targets have created a culture whereby teachers often find themselves teaching ‘to the exam’. Whilst an emancipatory process like lesson study has the power to disrupt some of these conditions and create opportunity for real transformative change, this cannot happen for as long as we are held accountable to and measured by, students’ exam grades. Such approaches are narrow-minded and short-sighted. Moreover, the pursuit of broader educational goals would likely affect exam grades in a more sustainable fashion. PPD (Proactive Professional Development, defined conceptually in Table 8.2) encourages teachers to re-evaluate their (performance) goals in terms of teaching and learning strategies, based on the learning needs
of their students as identified in their Teaching Plans. Lesson study then opens up a space for teachers to come together to share their ambitious educational goals, normally stifled by exam-focused tunnel-vision. Finally, the use of more intimate working relationships in the form of purposeful mentoring enables the sharing of knowledge, skills, and experiences in a safe non-judgemental and if need be, confidential, environment. Thus, the PPD framework attempts a “double morphogenetic” approach, whereby the teachers themselves find their characteristics altered in the process of engaging with lesson study and other professional development structures, and social change occurs in terms of individual teaching practice, organisational structures and/or collective operational procedures.

In Section 8.3. A Realist Evaluation, the cultural and social conditions which led to the ‘morphostatic’ short-term outcomes of B1-B4 as well as the overall non-desirable outcome O8, were identified, for example as the contexts leading to Pattern 2 Configuration A. Conversely, disruptive morphogenesis-seeking structures were introduced to navigate towards the desirable outcomes O1-O7, and these could be seen in Pattern 4 Configuration A. The context-mechanism-outcome configuration technique for the realist evaluation of programmes (Pawson & Tilley, 1997) can thus be used as a tool used to identify morphostasis or morphogenesis in relation to the causal powers of specific entities.

Part of the critical realist framework is also to acknowledge “historical time” and “hierarchized space” to create a “perspectival approach” (Mouzelis, 2008). Three types of structures can also be found: “internalized dispositional structures (Bourdieu’s habitus), institutional structures (sets of interrelated norms/roles) and relational, or figurational structures (sets of interrelated actors)” (p. 203). The actors’ “internalized structures”, either constraining or enabling in relation to their professional development, have been explored through contexts C1 and C2. Their interactional dimensions affecting actions, represent a major mediating link between agency and structure (whose causal powers are distinct from each other). The hierarchised social spaces the teachers are navigating are defined through context C3, with the final outcomes in the pattern configurations resulting from “the strategies of interacting actors
who often possess different amounts of economics, political, social or symbolic capital” (p. 212) within their contexts. This hierarchical nature of the school environment is often neglected in academic research but has been made abundantly clear in this work: the demands of the organisation must and often are, placed above all other personal projects in a constant prioritisation reflexive juggling act.

If “social causation as a unitary process entails the articulation via mediating mechanisms of intra- and interaction of the causal powers of agents (discernment, deliberation and dedication) and those of structures (internal and external constraints/enablements)” (p. 213), then I hope I have made a good attempt at this through my woven narrative and use of interviews and CMO pattern configuration. By viewing the social morphogenesis cycle as a “space-time matrix” (p. 227) entailing “features, some of which are and some of which are not manipulable by situated actors”, then further legitimacy can be added to the importance of the support structures provided through the PPD framework. As explored in Section 9.2, since the reflexive processes of actors are purely internal, it follows that the manipulation of external factors is the only possible driver of social change, and in this case, the means through which teacher development can be nurtured.

The morphogenetic cycle (Figure 5.1) which consists of the t₁-t₂ conditioning phase, the t₂-t₃ interaction phase and the t₃-t₄ morphogenesis/morphostasis phase, was introduced in Chapter 5 and its application to this research is now deepened. During the conditioning phase, existing cultures and structures at the macro-level “act through situational mechanisms to shape and condition agents at the micro-level” (Brönnimann, 2022, p. 3). These are the constraints and enablers observed in relation to their professional development powers on the teachers, as well as the unobserved social structures at play influencing the reflexive processes of teachers as they make decisions about their practice. Professional development programmes can be introduced here as enablers of teacher change.
Structures “have emerged from previous agency interactions” and possess their own emergent causal properties and cultures are the (shared) “beliefs, ideas, theories and norms” (Brönnimann, 2022, p. 4). These causal properties can be actualised just as much through the absence as through the presence of structures and cultures, interacting amongst each other to create “enabling and restricting conditions”. In so doing, four situational conditions which predispose people to distinct courses of actions arise, and they are defined by Archer (1995) as: necessary complimentary, necessary incompatible, contingent complimentary or contingent incompatible. The first two refer to general compatibility between the conditions and the agents’ current situations and the last two pertain to compatibility with regards to specific actions. Agents can also group together to form “collective(s) of goal-determined corporate agents” (p. 4) which can “cause change to create new structural and cultural formations”, exactly as described in Section 8.1. The Emergent Causal Properties of Lesson Study.

During the interaction phase, agents reflect on their situations and employ their determination, deliberation, and dedication powers to form courses of action or inaction. The four modes of reflexivity come into play here, as a means of characterising an agent’s disposition for social change and in our case, the four types of teacher developmental capacity (highly self-efficacious, motivated but inhibited, unmotivated yet capable and extremely challenged). These interactions lead to four modes of interactional behaviour between agency, structure, and culture (Archer, 1996): defensive, concessionary, opportunistic and competitive. In terms of teacher change, some aspects of teaching practice would be “interacted” alongside some aspects of teacher knowledge, dispositions, and beliefs.

Archer’s morphogenesis refers to change at the societal level, as an outcome of the previous phases of conditioning and interaction. In the context of teacher change, this refers to changes in teaching practice with the intention of improving students’ learning experiences or outcomes. Conceptualising teacher change in this manner enables us to focus on the conditioning and interaction phases as the necessary means through which such change can be actualised.
Thus, a teacher possesses agential powers and is subject to social conditioning through the causal mechanisms of pre-existing structures and cultures at the meso-level (department culture, school policies, etc) as well as the macro-level (national policies, etc) and micro-level (interpersonal interactions such as mentoring). The teacher “perceives changes through the presence or the absence of structures and culture in the environment under situational conditions” (Brönnimann, 2022, p. 5) and they will exercise their reflexive powers to reflect on these conditions. When collectives such as lesson study groups are formed based on shared interests and goals, this constitutes a new social structure with enhanced powers and liabilities. These powers may “change the existing social structures and culture through transformational mechanisms” which “act on the liabilities of existing structures”, leading to “actual and empirical events of morphogenetic change” or “morphostatic continuation of the existing structures”.

Lesson study, PPD and similar derivatives/variants known by any other name, are effective in their ability to engage a teacher’s knowledge and skills and refine the dispositions which are not only based upon their beliefs but also informed by their social realities. Through deep and purposeful reflection, defined by the reflexive actions of discernment, deliberation and dedication, these professional development practices enable the teacher to review, reform and rethink their teaching practice. Figure 9.3 below shows how these different aspects can be brought together, whilst appreciating that there are certain subjective and objective dimensions which will not be broached by such programmes, as a visual representation of the interaction phase of the morphogenetic cycle of teacher change. The purpose of continuous engagement with effective professional development practices is to identify the important aspects of teacher practice and teacher beliefs and dispositions which do need to change, for implementation in the conditioning phase. Over time, this continuous engagement enables the necessary evolution of teacher practice in a meaningful, effective, and sustainable manner, with the teachers in the driving seat and the students’ needs in mind.
Figure 9.3. The interaction phase of the morphogenetic cycle of teacher change (or ‘what we know and how we teach’)

The discernment phase is founded in existing knowledges and the deliberation phase draws on metacognitive skills, dispositions, and beliefs to determine a course of action or inaction, which may or may not result in broader structural/cultural changes, or morphogenetic change. Thus, certain “unactualised” beliefs, dispositions, skills, and knowledges are merely ‘dormant characteristics’ in relation to (potential) teacher change. And whilst certain professional development practices will focus on specific aspects of teaching practice, other aspects will be ‘uncontested’. Broadening the ‘circle of reflection’ at the centre of Figure 9.3 therefore expands the teacher’s potential by tapping more deeply or more often, into their dormant characteristics, evaluating more of their uncontested practice and realising more of their ‘teaching potential’.

Reflexivity, by virtue of being internal (an “intra-action” (Mouzelis, 2008, p. 201)), necessarily involves psychological aspects. However, this work is concerned with the constitution of the sociologically defined phenomenon of teacher practice rooted in complex ‘hectic’ school environments. As such, these psychological aspects have been conceptualised as internalised dispositional structures which are reflexively mediated to materialise as the structures observed in ‘teacher practice’, as originally described on Page 107: the subjective dimensions of teacher change are defined as pedagogic dispositions and beliefs and the objective elements of teacher
change are defined as aspects of teacher practice such as resources, curricula, and collaborative enquiry. When teachers exercise their beliefs and dispositions, they are drawing upon them as part of their reflexive deliberations in relation to the construction of their practice, itself an observable set of routines and structures. Morphostasis is the reinforcement of such practice through repetition and morphogenesis is the alteration of some aspect. Morphogenesis is thus pursued as a result of the teacher’s engagement with professional development activities.

The important distinction is that reflexivity is a relational internal exercise which aligns the self with the social world. When Archer comments on her “modes of reflexivity” for example, she is essentially assigning a set of collective psychological traits to individuals who have been observed to react to certain situations in the same way. Similarly, “constellations of concerns” are uniquely defined or interpreted based on internalised past experiences, or ‘beliefs’. From a professional development standpoint, these psychological factors are necessary (directly or indirectly) observable aspects of an individual which constitute their professional developmental capacity, enable/restrain their engagement with professional development activities and enable/restrain changes to their teaching practice.

The conceptualisation in Figure 9.3 is also supported by Peña Trapero & Pérez Gómez (2017, p. 76) through two powerful points:

- **Conscious control of action rests on unconscious routines.** As stated by Hamachek (2009, cited by Korthagen, 2010, p. 99), we consciously teach what we know, whilst we unconsciously show who we are.
- **Observation and reflection on one’s own practice, along with quality of interaction, are key aspects to voluntarily control unconscious mechanisms.**

By “rethinking knowledges, realities and methods together”, Law, Ruppert and Savage (2011) suggested we would be better able to “imagine a social that is radically different” (p. 14). This conceptualisation calls for just that, repositioning a method like lesson study as a “far more powerful theoretical tool[s] than anything that we call Theory with a capital T” (p. 12),
something which is formed and informed by the social actors and realities it interacts with, and
which in turn also forms and informs these social actors and realities.

Effective professional development practices such as lesson study support reflexive
deliberations on teacher practice (consisting of a multitude of actions as well as deeply formed
habits) by drawing on existing knowledge, skills, dispositions, and beliefs in a double
morphogenetic cycle whereby these internal structures can also be changed. A lesson study
collective can share knowledge thereby enabling a teacher to understand the previously unknown
whilst observations (of teachers and students) enable interactions with the previously
unexperienced. It also affirms ‘positive teacher dispositions’ and therefore nurtures teacher
developmental capacity. Thus, lesson study bridges the gap between what we know and how
we teach. At the core of this process, are the agential powers of the teachers, which they exercise
reflexively. This type of teacher change can therefore be considered emancipatory for it does not
dictate or impose, but rather provides the “supportive conditions” for internal deliberation which
is required for “opportunistic” actions such as “exploration, innovation and experimentation
events” (Brönnimann, 2022, p. 5). The process is double morphogenetic in that not only are
practices and structures amended (social change), but internal change also occurs as knowledges
increase, skills are refined, and dispositions and beliefs are accrued, disposed of, or adapted
(personal change).
10. Conclusion

This thesis posed the dual questions ‘How can lesson study be adapted to meet professional development needs?’ and ‘How do teachers adapt their practice as a result of engagement in professional development activities like lesson study?’. It was conducted as an action research case study, with qualitative data from teacher interviews collected over two years and concluding with an in-depth exploration of the reflexive processes of four Maths teachers in a London secondary school. Throughout the thesis, critical realism (Archer, 1995; Bhaskar, 1975) was used as the over-arching philosophical paradigm.

In answer to the practical research question, I found that lesson study on its own was unsustainable and ineffective in addressing the professional development needs of the teachers and therefore required considerable adaptation for the context. A lesson study disposition was defined as the ultimate emergent causal property (Edwards et al., 2014) of lesson study, whereby teachers apply their self-efficacy to modify operational procedures or organisational structures, within a culture of collaborative enquiry. To achieve this, I designed a Proactive Professional Development (PPD) programme which addressed teachers’ developmental needs through personalised support and by integrating lesson study and other effective professional development practices into existing school structures. The case study was then realistically evaluated (Pawson & Tilley, 2004) to map contextual factors and potential causal mechanisms of lesson study and PPD to outcomes, as the first-level analysis of the empirical data. This identified specific pattern configurations with positive outcomes, which could be causally linked to participation in professional development activities. An adapted Lesson Study Journal, a Personal Development Plan and a Middle Leader’s Guide to Nurturing Excellence (all in Appendix C. Professional Development Guides) were also produced as guiding documents to replicate key professional development processes, and recommendations were made for future policy and practice.

The second more theoretically inclined research question led to a two-dimensional codification defined as teacher developmental capacity (in terms of teachers’ unique constellation
of objective constraints as well as their subjective stance towards engagement in developmental practices) as the key determinant of lesson study/professional development effectiveness. A proactive stance to professional development could be fostered (by school leaders) by creating a value-driven culture and nurturing meta-cognitive skills to support sustainable teacher development programmes which are contextually informed, motivating, and coherent. Such programmes necessarily include professional development mechanisms like lesson study which support reflexive deliberations on teacher practice and draw upon the enhanced collective powers of teachers. A final double morphogenetic model for teacher change was presented, which posits reflexive discourse as the vehicle for change whereby practices and structures are amended (social change), and internal change also occurs as knowledges increase, skills are refined and dispositions and beliefs are accrued, disposed of, or adapted (personal change).

This thesis contributes to the literature on teacher professional learning by bringing together social and psychological aspects of teacher change through a novel application of social critical realism. Under the theoretical framework of social morphogenesis, I integrate key concepts of self-efficacy, knowledge, beliefs, dispositions, and reflexivity to explore teacher change in a manner which also encapsulate the deeply social aspects of this process. This extends on the works of Mynott (2019) and Peña Trapero & Pérez Gómez (2017), whose theoretical models (based on alternative paradigms) for the professional development of teachers following lesson study laid the foundations for mine.

This work also brings into question arguments for ‘purist approaches’ to lesson study, within the broader misplaced practice of generic professional development programme implementation. My conclusion is squarely that lesson study can and should be adapted, for its success is configurational in the sense that various (inevitable) contextual and mechanism alterations necessarily result in varying sets of outcomes. Moreover, previous (somewhat intellectualist and classist) prioritisations of certain types of teacher knowledges above 'informal' experiential educations, devalue (past and present) teacher experiences, which form an essential aspect of the interaction phase of the double social morphogenetic cycle of teacher change. Teachers come
from a breadth of backgrounds with broad knowledges and complex social histories, therefore their development should not be narrow, but open to capturing the richness of these vast knowledges and skillsets. Teacher developmental capacity could thus provide a fluid conceptual framework for teachers’ current states, as reflexively defined by themselves, and contextually grounded by their circumstances. Importantly, this can be developed as it is not a measure of the teacher's overall potential, but a snapshot based on the current pulls and pushes of the constraints and opportunities they are being afforded.

As a result of my study, researchers of lesson study might wish to broaden their definitions of the mechanism to focus on its emergent causal properties, particularly to encourage a lesson study disposition. Further contextual adaptations could be created and evaluated using the tools presented in this work. Importantly, school leaders, policymakers and education researchers could apply the concept of teacher developmental capacity when assessing contextual factors and consider the effectiveness of professional development practices in terms of the double morphogenetic cycle of teacher change. Realist evaluation (Pawson & Tilley, 2004) could also be considered as a useful analytical tool in assessing the effectiveness of professional development programmes.

My conceptualisation of teacher change also calls for a re-prioritisation of teacher professional development from a boundary activity to a core function of schools seeking to improve student learning in a manner which is relevant and reactive to the demands of society. I add my voice to the countless others seeking greater teacher autonomy and access to meaningful and effective professional development, not solely for the means of adapting practice but as an essential aspect of re-affirming the dispositions, beliefs and values required to support and motivate teachers in the face of record teacher attrition in England (Fullard & Zuccollo, 2021).

On a personal note, the professional doctorate format has enabled me to think more deeply about teaching and learning by affording me the space and structure to ask seemingly unanswerable questions about the very fabric of the social realities we inhabit. This was
invaluable to my personal development and will enable me to become a more well-rounded school leader/educationalist.

Conversely, the niche perspective and insights I have shared in this thesis, also contribute to the academic landscape: schools with demographics like the Academy or Midlands Secondary School, are markedly under-represented in academic research because they are tough places to untangle, and the contribution of teachers remains limited to the production of theory-devoid ‘top tips’. Indeed, although the teacher profiles were brief, they compose a much more diverse picture of teachers as professionals, with needs of their own, which are grossly neglected by a system which insists on measuring performance rather than supporting and enhancing it.

In increasing the ‘contextual validity’ of the field of educational research, it is essential that the EdD (Doctor of Education) course, which currently finds itself on the wrong side of policy trends, continues to arm practitioners with the theoretical know-how, for it enables us to develop a more relational understanding of the world. Because it is the practitioner who operates under their contextual constraints, this makes us best placed to report on them.

A purely academic study on lesson study can only contribute so much to our knowledge of professional development: it is by observing it in action, gathering the perspectives of those who interact with it first-hand and understanding the complexities of the classrooms, schools, and communities that we develop a true understanding of its “double social life”. Professional doctoral researchers are able to take dense theories out of university libraries and put them to the test in classrooms, in order to reconceptualise them in relation to the real world. This is an invaluable aspect of educational research which is lacking to the point of rendering it obsolete: in a field whose primary purpose is to create a call for action, educational researchers cannot exist solely as external observers.

10.1. Evaluation

Critical realism provided the meta-theoretical stance which permeated virtually all aspects of the research. From the exploration of ‘the social life of lesson study’, to the narrative streak, it
enabled thick yet purposeful descriptions. From the emergent causal properties of lesson study to teacher developmental capacity, it enabled the conceptualisation of complex social phenomena. The methodology was also founded on the ontological layers of reality (the real-empirical-actual realms), such that a realist evaluation of the implementation could be conducted, and abductive/reductive analyses could further generalise potential mechanisms without losing the contextual richness. Ultimately, the final explanation of how teachers change their practice was an application of the social morphogenesis cycle. Critical realism also added rigour to the empirical processes to strengthen the use of action research for the generation of theoretical knowledge, as opposed to practical knowledge, thereby also contributing an original purpose-built methodology. The drawback of this approach is in its foundation in causal mechanisms (which are not empirically observable). These were inferred and therefore necessarily passed through my perspective. The validity of this process was drawn from the established sociological and philosophical foundations of critical realism, which ultimately embodied the research purpose in a way which was unmatched by any alternative paradigms.

Some very big sociological concepts have been broached in this research, with the intention of providing a deeper more ‘situated’ explanation of lesson study. Within the scope of this thesis, they have only been explored as far they were deemed ‘useful’ in fulfilling the objective of the research, that is, to contribute to the betterment of teaching for the ultimate purpose of the betterment of student learning. I have borrowed and stolen the terms and concepts I required to better achieve this. This practical concern might seem like a contradiction with the ‘meta explanations’ offered through critical realism when in fact, explanations about the social world (at the deepest ontological levels) are precisely the means through which critical realists aim to actualise social ideals.

The consequence has been that this work is not presented in a neat parcel but is demonstrative of the ‘messy realities’ it is reporting on. If it has over-reached, then this is a reflection of how teachers are constantly over-stretched as we are expected to navigate a breadth of knowledges and skills, which if listed, would seem impossible, yet can be regularly seen in action in the practice of
effective teachers. With its many frayed and loose ends, it leaves much to be further explored and tidied up but hopes to have addressed its core purpose of finding deeply thought-out and honestly reported solutions to some very real and complex problems facing teachers right now.

Since realist evaluation “begins with a programme theory and ends with a refined programme theory” (Pawson & Tilley, 2004, p. 22), I began with the established process of lesson study and ended with the extended model of Proactive Professional Development, which approached professional development more broadly but was still intent on actualising the emerging causal properties of lesson study. However, like lesson study, the proposed professional development model is open to interpretation, the professional development mechanisms utilised can and should be implemented in a variety of ways, and PPD is intended as an example of an effective framework as opposed to a programme to be replicated. Importantly, process evaluation has been valued over outcome evaluation. The primary purpose was configuration design, thus the research focused on mappings between the contexts and the outcomes, as opposed to outcome classification. The ultimate outcome of this type of evaluation is not a pass/fail verdict but the design of “better-focused and more effective programmes” (p. 15), whereby the empirical data serves to adjudicate between rival explanations.

The overall aim has been to generalise, not about populations but about “theoretical dispositions”: to create “theoretical generalisations” which are deemed “more enduring and can be applied through time and space” (Edwards et al., 2014, p. 18). These theories can then be re-evaluated should any empirical evidence to the contrary be found, very much in line with how people ‘make their way through the world’: developing and amending personal theories which are drawn upon when establishing new lines of thought or action. Such a form of generalisation is deemed more powerful by critical realists in contrast with generalisations of empirical instances as the latter only provide ‘thinner propositions’ which can have “limited explanatory value” because of their inability to inform the “why, to what extent, and in which circumstances” aspects of a phenomenon (p. 19).
These theoretical models are the most transferable elements of this work, and they can be reapplied in similar evaluations or analyses of similar developmental mechanisms. Since many aspects of this context are likely to be present in many schools, this case study contributes knowledge which is “theoretically transferable” (Vincent & Wapshott, 2014) across many cases. In explaining my particular case, I have identified some of the conditions which could help establish commonalities in the endless pursuit of the refinement and extension of the professional development model presented.

**Phase 3**

The final action research cycle, Phase 2, built a model for professional development: an extension of lesson study which coalesced the well-established idea of lesson study with teacher Personal Development Plans and was bolstered by underlying personalised support structures. These were designed as a countermeasure to perceived structural concerns identified in Phase 1 and was a deliberate manipulation or ‘priming’ of subjects to enhance the theorised causal powers of lesson study. Lesson study was no longer positioned as the main arbitrator of teachers’ professional development, but a singular part of a wider process involving the right balance of support and challenge. The phase then concluded that this improved the focus of the teachers but needed deeper integration. As the final part of the thesis evaluation, I plan a hypothetical Phase 3 to demonstrate recommendations for further research, with suggested methodological and implementational changes.

Firstly, a subsequent phase might generally benefit from a re-sequencing of the case study propositions: (i) how do mathematics teachers construct their teaching practice, (ii) how do beliefs and dispositions affect these constructs and (iii) how do development-boosting structures, such as lesson study, affect the beliefs, dispositions, and practices of teachers? This would require a further exploration of teaching practice as a set of habits, which have been formed over time through conditioning and unconscious mimicry as well as through conscious design. A suitable research question might be: *How do teachers resolve their (possibly inter- and intra-conflicting) beliefs and dispositions within the structural constraints of their contexts to execute their*
perceived notions of ‘excellent teaching’? (Page 108), enabling the further exploration of the method of lesson study in relation to the sociological constructs of internalised dispositional structures and external objective structures and cultures.

In terms of lesson study/professional development implementation, I would relinquish ownership of the lesson study and take on the role of a kushi or ‘knowledgeable other’ to both decrease my influence over the process and develop a colleague’s lesson study leadership skills. ‘A middle leader’s guide to nurturing excellence’ could also be shared with other team leaders, asking for feedback and opinions, to inform amendments. My programme had introduced more professional development mechanisms, which could be further conceptualised using critical realism. Conversations around mentoring in particular, could be lengthened to further evaluate and augment its effects.

This work has progressed parallel to my career: lesson study was first approached from a class teacher perspective, then developed from a team leadership (or middle leadership in schools) to consider developmental structures. The next progression point would therefore be institutionalised, from a whole-school leadership stance. Methodologically, a more structured ‘contextual review’ could be conducted prior to the data collection, perhaps based on a pre-determined set of questioning frameworks to formalise this process in a way which might make it more reliable and more easily transferrable across different settings.

Finally, and most pertinently, the validity of the critical realist design could be improved by focusing on the interview questions. The generalisations produced here are based on empirical data which was predominantly collected through interviews. As an essential means of gathering perspectives to explicate social world phenomena, interviews are a crucial critical realist tool. Interview questions could therefore be improved such that they are “more coherent with the underlying realist philosophy to support retroductive data analysis methods” (Brönnimann, 2022, p. 2). This would then further strengthen the realist evaluation C-M-O pattern configurations and produce more rigorous causal links.
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