WHEN USING COMPLEXITY THEORY AS AN APPROACH TO METHODOLOGICAL DESIGN AND ANALYSIS, WHAT CAN WE LEARN FROM TEACHERS ABOUT SCHOOL IMPROVEMENT?

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ABSTRACT

It is the teachers who are at the forefront of any school improvement and how they experience it impacts on development strategies and outcomes. This study explored teacher perceptions of school improvement. The thesis contributes to new knowledge by offering an original approach to qualitative research using the lens of Complexity in the data collection and analysis. It aligns itself with Grounded Theory yet offers an alternative approach using a predetermined theoretical framework. It also builds on the current literature that considers teachers' perception of the impact of collaboration, teacher leadership and change, on school improvement and student outcomes.

The study employed the lens of Complexity Theory. It used semi-structured interviews with six teachers over five phases. Each phase of questions reflected a group of Complexity Theory characteristics and responded to the emerging data. The final phase of the research utilised a focus group, with a different set of six teachers, to test initial findings. This thesis presents a predetermined thematic methodology that has its foundations in the approach associated with Grounded Theory.

This study has contributed to new knowledge by exposing five school improvement tensions. These tensions are, Credibility, Time, Power, Practical solutions, and Striving for Equilibrium. The teacher perceived tensions create barriers to improvement but also act as a springboard for change. For example, external sources of expertise who can offer opportunities to recognise development needs, conflicting with experts who are not perceived to be credible and are perceived to hinder school improvement.

The school leadership implications for future practice include, considering how the five tensions can be exploited to ensure optimal school improvement opportunities, and how tensions can be better balanced to support teacher workload and wellbeing. The study suggests that Complexity Theory and the five tensions are a useful way to consider the implications of new school improvement policies on teachers and schools.

DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas. Any views expressed in the thesis are those of the author and in no way represent those of the University.

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For Charlie…

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Chapter One: Introduction

This chapter outlines my personal and professional rationale for this study and provides an explanation of my personal experience and values related to school improvement. It proposes the study's original contribution to knowledge.

This chapter explains why I have developed my methodological approach through the lens of Complexity Theory (a theory that uses characteristics in explaining change and emergence in systems and is described in detail in chapter 3). I provide a brief explanation of my previous experience of using Grounded Theory (an approach to research that develops theory and hypothesis that is 'grounded' in a systematic review of data) as an approach to research and why this is important in explaining the methodological and analytical approach used in my study.

Chapter 1 concludes by considering the rationale for studying school improvement in the current political and national landscape and explains my research aim and objectives. An outline of the whole thesis is then provided, followed by a conclusion.

1.1 Personal and professional rationale – school improvement

It is important to consider both my previous school and educational research experience, to explain the rationale behind my approach to this study. It is also important to consider why the study of school improvement is paramount.

I have worked as a teacher for over 20 years and as a school leader for more than 10. I have been involved in school improvement as a newly qualified teacher, as a subject leader, special educational needs coordinator and now, as a headteacher. In every role (teacher, subject leader, special educational needs coordinator, deputy head, and headteacher) I have held some responsibility for making improvements across the school. I have worked in a school graded by The Office for standards in Education (An agency commissioned by Government to inspect English schools, Ofsted) as 'special measures', another as 'requires improvement', and worked in Ofsted graded 'good' schools. School improvement has been a prominent feature of my experience in the education sector in each of these roles, schools, and stages of my career. How schools have approached and measured (or not) these

improvements, has always interested me. How schools decide on which areas of the school need improvement and define the impact, has intrigued me, because of the differing reasons, activities, and outcomes.

The cost of school improvement can be high, not only in spending already stretched budgets, but on people's time and energy. This time and energy could otherwise be focused on classroom responsibilities that directly impact on the pupils' lived experienced every day. This includes offering feedback to pupils on work, preparing resources for the following days lessons, or preparing resources. Therefore, the approach to school improvement should be carefully considered. Understanding whether the strategies have been researched, trialled, and proven effective, is vital, but so is evaluating how these strategies will be experienced by those who will put them into place.

It is the teachers who are at the forefront of any school improvement and as Harris and Muijs (2005) suggest, teachers are those able to implement change and make the difference to the pupils learning.   I would also argue that how school improvement feels to those who are experiencing it must impact on the outcomes for pupils and schools. Therefore, how the teachers perceive school improvement will impact on the strategies themselves. This view is supported by Allen, Evans and White (2021) who recognise that the power of revealing the accounts of the 'diverse ways' (Allen, Evans and White, 2021, p. 11) teachers make sense of the complex school system that they work within. The school improvement initiative and how it will be perceived, should therefore be carefully considered, then attempts might be made to reduce the impact on budgets, time, and teacher effort.

So often, school improvement is discussed in meetings between school leaders, governors and outside agencies. School development plans are often written and evaluated by the same stakeholders, with teachers playing only a small part in how these processes evolve. Yet, it is the teachers that implement the strategies. It is the teachers that are required to change their practise, take part in professional development, trial new strategies, and often lead the areas of improvement. Despite the process of school improvement being important in the success of these strategies, in my experience, teachers are rarely asked to evaluate, reflect, or offer suggestions about how the improvement itself could be improved. I am interested in

their views. What can teachers tell us about what improvement works well? This is not necessarily the recorded impact, or the impact targets that get measured against on a school development plan, but the impact that they see, every day and over time. What strategies have worked well and what have they learnt from their experiences of school improvement? Most importantly, what can we learn from them?

Through my work in schools, I have seen the frustration of teachers when strategies are not completed and when there is no outcome or conclusion to something they have worked hard on. Leaders also become disengaged when something they have put in place does not continue over time or becomes forgotten after a new strategy or project becomes the focus.

Most people who work in education recognise the pace at which change occurs, and this is accepted and managed. However, does the pace of change impact negatively on the very improvement that the teachers are being asked to make? I have heard colleagues who have been teaching the longest (including myself) discussing how a strategy has been tried before or reminiscing about training they have been on that worked well or never amounted to anything constructive. Both the pace of change and the way strategies are perceived at a point in time, puts pressure on teachers. At a time when leaders are evaluated by The Office of Education and Standards (Ofsted) on their contribution to staff wellbeing, it seems important to ensure teachers feel part of, and energised by, school improvement. It is important, of course, to make all strategic decisions with the pupils at the heart of this process, but it is also important to listen to and consider those whose daily practise gets impacted on the most, the teachers. Only then, I would like to suggest, will school improvement be effective and impact in a positive way on those it should, the pupils.

1.2 Personal and professional rationale – Methodological approach

Prior to this study, I completed a master's degree thesis that considered how teachers felt about the support in place for them as teachers of pupils with special educational needs and disabilities. I identified how the successful processes that support teachers reflected some of the characteristics of Complexity Theory. I am therefore interested in whether Complexity Theory can be used in the education

sector, to describe and support the strategic direction of improvement across the school (not just in the improvement of the provision for pupils with special educational needs).

Within my previous study I used Constructivist Grounded Theory (a research method that focuses on generating new theories through inductive analysis of the data) in my methodology. I have therefore used some of the epistemological ideals from Grounded Theory within my methodological development of this study (explained further in chapter 4). My experience in using Grounded Theory was mixed, as I found the lack of structure successful in allowing the data to inform the theory, but I also found it restrictive. Having no boundaries or structure within which to work was daunting and challenging, as was the absence of a planned and predetermined research process. Despite the perceived lack of boundaries in Grounded Theory, being true to this approach, was itself restrictive. At times I felt like I needed a structure and theory in which to base my initial data collection and analysis. In my current study into school improvement, I have addressed this by using Complexity Theory to structure my data collection and initial analysis, while allowing myself the opportunities to make decisions in an iterative manner. This approach (making decisions about future data collection after analysis of the data) most closely aligns to Grounded Theory. Therefore, I would consider my approach to run in parallel with that of Constructivist Grounded Theory, albeit with the significant difference in starting points. My research methodology therefore seeks to bridge the gap between how Grounded Theory responds thematically and providing a structure for a thematic response to research. This is further explained in chapter 4 (4.8).

My master's research into teacher perceptions about leadership activities related to special educational needs leadership, also felt unfinished. It did not explain why certain approaches were felt, by teachers, to be most effective at supporting them. In researching school improvement, I wanted to rectify this and understand the reasons for teachers' perception into successful or unsuccessful strategies.

1.3 National and political rationale
In chapter 2, I consider how the political context has impacted on schools and their improvement. This is because the political climate impacts heavily on education,

through published White papers (detailing the direction of future education policy), the passing through British Parliament of Education Acts, changes in government policy, and Government organisations such as the Department for Education (or Dfe, responsible for developing policy and practises in the English education system) and Ofsted. Due to the power of these policies, statutory requirements and evaluative Government bodies, schools are forced into changing their policies, practises, and therefore their school improvement focus.

The impact of the global pandemic (Covid -19) in 2021 and 2022 on schools has been great, not only through partial closures and remote learning, but through the expectation of the British Conservative Government for pupils to 'catch up' and for schools to focus on learning that has been missed. This has shaped school policy and practise and school development. The focus for schools has been on improving teaching and learning to ensure that children cover gaps in the curriculum, particularly with the groups of children who may have been most affected by the pandemic. Therefore, it is important to research school improvement more than ever, because of the political and national pressures schools are facing.

1.4 Research aim and objectives

As reflected in my personal and professional rationale, I believe that teachers have a significant role in the success of any school improvement. Therefore, I consider the perceived experiences of teachers to be important in any strategic planning and school development. My previous experience of educational research demonstrated how Complexity Theory can be a useful lens through which to consider and analyse data on school improvement. Therefore, my research question, aim and objectives are developed from my personal and professional experiences.

1.4.1 Research Aim, Objectives and contribution to new knowledge

The aim of the study is to understand teachers' perceptions of school improvement.

The objectives of the study are:

- To develop a methodology that bridges the gap between the thematic response of Grounded Theory and responding with a predetermined theoretical structure.

- To develop a methodological approach that used the characteristics of Complexity Theory in its data collection and initial analysis.
- To identify characteristics of Complexity Theory in teacher perceptions of school improvement.
- To expose teacher perceptions of school improvement.

The aim and objectives supported the development of new knowledge. The new contribution to knowledge is that teachers perceive five tensions in school improvement. These tensions offer a new perspective within the current school improvement literature. These tensions describe the challenges and stimulus for change within the categories of Credibility, Time, Power, Practical solutions, and Striving for Equilibrium. New knowledge is offered in the description of these tensions, and these are described using Complexity Theory.

This thesis also offers an original approach to the study of school improvement. It uses the lens of Complexity in both its data collection and analysis. The thesis uses a pre-determined theoretical framework within the research instruments and uses the theory in the coding and decision making about the future direction of data collection. This provides a structured framework in which to discuss the complexities of school improvement. Although the use of Complexity Theory is more prevalent within Health research, there has been limited use within education.

The methodological design of this study aligns itself with Grounded Theory. However, it offers significant differences in its approach due to the use of a predetermined theoretical design. Grounded Theory provides the foundations of the approach, where the theory is enabled to emerge from the data, however, a new contribution is offered with the use of Complexity Theory lens.

1.5 Structure of thesis

The literature review for this study has been written over two chapters. In chapter 2 the focus is on school improvement, and in chapter 3, on Complexity Theory. Chapter 2 offers a discussion on the definition, political context, and literature on school improvement. Chapter 3 considers how Complexity Theory has been used in

other bodies of research and how it can be recognised in the school improvement research to date.

Chapters 4 and 5 explain the methodology. In chapter 4 there is an explanation as to why Complexity Theory has been used instead of the more traditional reductional methodology (typically used in school improvement). The chapter also describes how my methodology uses Complexity Theory to provide a structure in its thematic response to research, in contrast to thematic response of Grounded Theory. The chapter describes the phases of the research and how Complexity Theory was also used within the initial analysis of the data.

The choices made about sampling and research instruments, and why these are suited to a methodological approach that reflects the characteristics of Complexity Theory, is discussed in chapter 5. How these research instruments were used is then outlined and the chapter also describes how the data analysis took place and the decisions made as part of the iterative approach. The chapter explains the differences between the use of Complexity Theory in the initial coding followed by the open coding of the second stage of analysis.

Chapter 6 identifies the key themes identified after initial and secondary coding of the interview transcripts and offers subjects to consider for the focus group discussion. Chapter 6 then uses Complexity Theory characteristics as a framework for a discussion about how the key themes relate to Complexity.

In chapter 7, the analysis of the focus group discussion is considered, and the findings of the study are described in chapter 8. Chapter 8 discusses the findings of the study. How the findings relate to Complexity Theory is deliberated in chapter 9, and consideration is given to the absence of some Complexity characteristics in the findings. Chapter 10 offers a discussion on the methodological strengths and limitations of the study, concluding thoughts on how the study's aim and objectives were fulfilled and the potential implications of this study. A conclusion is then offered.

1.6 Chapter one conclusion

School improvement warrants further investigation from the perspectives of teachers as this is not a perspective that has previously been researched, despite teachers being those directly responsible for making changes to their subject leadership and classroom practices. I propose that that in the current political climate, and because of the global pandemic, this research is of particular interest. This is due to the pressure schools are under to improve outcomes for pupils despite the missed and interrupted schooling during the global pandemic. Current recent pressures, such as the current Ofsted framework focusing on subject leaders and their leadership of all curriculum subjects, and the changes in working during the global pandemic (Covid 19), has meant that changes to ways of working have been significant for teachers. These changes have often meant that there has been a need, in some schools, for rapid school improvement. My previous research has indicated that Complexity Theory has the potential to offer insights into how schools change and how they can be described. Writers such as Allen *et al.* (2021) and Cilliers (2000) have also suggested that Complexity is a useful lens through which to view schools and school improvement. I have outlined my use of Complexity Theory in the methodological design and description of school improvement and therefore the following chapters (2 and 3), will therefore consider school improvement and the Complexity Theory literature.

Chapter two: Literature review – School improvement

2.1 The literature review structure

In chapter 1, the rationale for researching school improvement was offered, as was the suggested use of Complexity Theory as the theoretical lens of the study. The literature review is therefore approached in two parts in order that both the school improvement literature and the Complexity Theory literature are reviewed. Chapter 2 examines the school improvement literature, including the political context, definitions, and how this literature relates to my research aim. The literature review in chapter 3 introduces Complexity Theory, how it has been used in research and how previous school improvement research aligns with the theory.

2.2 Political initiatives and their impact on school improvement

This chapter's literature review considers the current literature on school improvement, beginning with an introduction to the political context and how it has shaped school development. This is followed by a discussion of how preceding and current literature defines school improvement. Prominent themes noted in the literature and proposed improvement challenges are then discussed. Concluding comments in this chapter address the research aim and objectives of this study.

As a public service, funded by Government (rather than being funded privately by parents, as is the case with the private or independent education sector), public mainstream schools are financed to support their community. As a result, public education is impacted on by social consensus and by Government regulation and reform. In this chapter I will suggest what are the key historical influences on public education's school improvement journey, by providing an overview of external influences. It is important to expose these initiatives, as Allen, Evans and White (2021) argue, because there does not appear to be a successful approach to school improvement initiatives for all school. This is evidenced by the number of schools who struggle over time to improve, despite the efforts of such universal initiatives. Examples of these universal political initiatives are now discussed.

2.2.1 The Office for Standards in Education, Children's Services and Skills (Ofsted)

Arguably the greatest external impact on the direction of school improvement since its commission by the British Government, is The Office for Standards in Education, Children's Services and Skills (Ofsted). Created after the Education Schools Act in 1992, Ofsted aims to provide an impartial set of judgements to schools after an inspection. One of its priorities, is to 'lead directly to improvement' (Ofsted, 2014, p.1). In the 1993 Education Act, new powers were given to remove schools from the control of local governing bodies if Ofsted considered the school to be performing below accepted standards. I would suggest that this has added a pressure to schools to perform well in an Ofsted inspection. It has also resulted, in my experience, in some headteachers resigning from their posts after a poor inspection and the school then being directed into a multi-academy trust. I would propose that this process has ensured that schools have directed their school improvement focus to ensuing a strong outcome when the school's Ofsted inspection in imminent.

In 2005, Ofsted encouraged school leaders to write a self-evaluation framework (SEF), a document that required school leaders to identify key strengths and areas for school improvement. The SEF documentation was used (and still is an optional submission on the Ofsted portal in 2023) in Ofsted inspections. Inspectors used this document in the 2005 inspection framework to evaluate if leaders were able to accurately evaluate their schools and whether they were reaching the expected standards. It was also used to determine whether leaders (and the schools themselves) could demonstrate their capacity to improve. At this time, schools could not be considered 'good' unless they engaged in systematic self-evaluation, monitored the performance of pupils, and intervened when necessary.   Often a self-evaluation framework was structured using the Ofsted Inspection Framework, because they were analysed so closely by inspectors during an inspection. Often each Ofsted framework descriptor formed a heading within the school's self-evaluation documentation, with evidence of improvement detailed below the Ofsted performance descriptor. By producing a document that detailed current school practise and areas for improvement aligned with the Ofsted descriptors, school leaders were structuring any planned improvement against the areas of value according to the Ofsted framework and their inspectors' judgements. This ensured that Ofsted influenced the direction of any school improvement.

In 2009, a new framework encouraged Ofsted inspectors to spend more time in classrooms, focus on the performance of groups (especially pupils classed as vulnerable) and as Elliott (2012) recalls, focus more than they had historically on safeguarding. This encouraged school improvement to focus on ensuring safeguarding procedures were secure, that the attainment and progress of pupils in receipt of pupil premium was strong, and that provision for pupil premium was tailored to individual needs. This resulted in many schools beginning to work with organisations such as 'Achievement for All' (a charity created to support schools in their approach to using the pupil premium grant in English schools) to evidence that the school was improving provision for more vulnerable pupils. Organisations such as 'Achievement for All' were costly for schools, and I would argue were used by schools in different ways, with differing successes. For example, in one school I worked in that commissioned an 'Achievement for All' coach to work with staff, they focused training on strategies to support pupils considered to be falling behind in the curriculum. Whereas another school that commissioned 'Achievement for All' directed their coach to look at tracking data of pupils in vulnerable groups. I would suggest that this shows how the Ofsted framework caused schools to direct their improvement into these specific areas of the school.

Prior to 2012, a school could be graded by Ofsted as 'outstanding', 'good', 'satisfactory' or 'unsatisfactory'. In 2012, the new Inspection framework replaced the 'satisfactory' judgement with one that shows a school 'required improvement'. This remains the judgement description to date and directs school improvement in many schools, particularly those who feel they may be at risk of becoming a 'requires improvement' school. In schools there has always been a focus on what Ofsted are looking for, particularly in the months preceding a potential inspection. I would propose that the use of the inspection framework to direct how schools review their policy and practise has become commonplace in the primary sector. This is determining that the school can evidence they are at least within the 'good' category and directing any school improvement into areas where they self-evaluate themselves to be below the 'good' Ofsted grading. This ensures that schools direct their strategies towards the areas Ofsted value.

In 2014, a poll of teachers, funded by the Teacher Support Network, revealed that 90% of teachers felt that Ofsted had a negative or neutral impact on pupil results

(Teacher Support Network, 2014). This shows how teachers felt Ofsted to be directly linked to improving outcomes for pupils. As school improvement is often linked to pupil outcomes, this reveals a link between school improvement and Ofsted. I would suggest that previous Ofsted frameworks (the evaluative framework for inspection that Ofsted inspectors are guided by) has ensured that school improvement directives have been focused on subjects that are reported and tested on. This would therefore put forward that Ofsted have had an impact on the improvement focus of schools.

There was an emphasis change in the Ofsted inspection frameworks in 2019, where both safeguarding and the impact of Governance and Management, were highlighted. There was also a change in focus to inspecting schools' provision of the broader curriculum, to ensure that foundation subjects (such as art, computing, and physical education) had as much emphasis as the core subjects (English, maths, and science) had received in previous inspection frameworks. This has meant that, because of the change in how Ofsted inspects schools, schools have looked to improve their curriculum in line with these new Ofsted expectations. The focus on the wider curriculum by inspectors (rather than an almost sole focus on English and maths), has been mostly viewed positively by schools, I would suggest that this change in focus has greatly impacted on the direction and focus of school improvement over recent years. As part of this change in inspection framework, Ofsted provided schools with a twelve-month transition period, during which time schools were expected to develop their curriculum. After the twelve-month period, inspectors expected to find that schools had a well-developed and well-sequenced curriculum. Again, I would argue that due to the implications of receiving a poor Ofsted grading (discussed at the start of this section of the chapter) this example demonstrates the impact Ofsted continues to have on school improvement. This results in the Ofsted inspection frameworks (or criteria for being judged as a 'good' or 'outstanding' school) remains integral in school improvement decisions. This in turn impacts on the working practises and experiences of teachers.

2.2.2 League Tables

English school league tables (publicly published results, which placed schools in an order in relation to their success with end of year statutory tests) were published for the first time in 1992. Aiming to provide parents with greater informed school choice, the origins of the league table strategy can be found in the 1992 *Education Reform Act*, which introduced the National Curriculum. Initially the end of key stage two (the end of year 6 in the English school system) statutory tests (SATs) were published. In 1997, the league tables were adapted to include 'progress' measures. Between 2002 and 2005, this progress was measured based on the progress deemed to be expected between set data points. These data points were measured between pupil year groups 2 and 6, otherwise described as at the end of each key stage (key stage one being the end of a pupil's second year of the National Curriculum in England and key stage 2 being the end of a pupil's sixth year of the English National Curriculum). This changed in 2006 to include contextual information, such as lower starting points, or pupils from disadvantaged backgrounds. This could be considered as vital, not least for schools in disadvantaged areas, who could, as Muijs *et al.* (2004) consider, be making strong gains for pupils who are more disadvantaged than their peers in schools in more affluent areas.

Another change in 2011, saw the value-added progress being defined as, the expected progress from previous data points. Value added data therefore suggested what value schools have added to pupils' education between the end of a pupil's year 2 (or key stage 1) and the end of a pupil's year 6 (or the end of key stage 2). Due to the Covid-19 pandemic, league tables were not published in 2020, 2021 and 2022 (however the data was made available to local authorities and Ofsted in 2022). However, criticisms were still made, with concerns about the number of variables outside of school control, impacting on the data.

Taylor and Ngoc-Ngugen's (2006) study found that despite the changes in 1997, progress measures remained an unreliable measure of school performance. Gorard (2008) supported this view, that as a way of comparing school performance, value added data was misleading for parents and educators. Van de Grift (2009) identified that the data was significantly affected by missing data (because of pupils moving schools or by being absent) and was therefore misleading. I would also suggest that the data does not give an accurate reflection of school contexts and the challenges

they may be facing (or the positive impact they are having on facing these challenges). I would further argue that league tables only reflect a small area of the curriculum and do not offer parents a true reflection of the whole school and what they offer the children and families they work with.

The influence of the school league tables on parental choice impacts on school funding. This is because schools in England are largely funded based on the size of the school, or more specifically, funded based on the numbers of pupils at the school. The less parents that choose a school (based on published league table information) the lower the funding schools can expect to receive. Due to English and maths being the focus of the league tables, I would propose that this has historically directed school improvement to focus on the reported subjects (English and maths). Ofsted recognised the impact of these school league tables on school improvement and made significant changes to the focus on curriculum in their inspection framework in 2019. They recognised that schools had become reliant on their English and maths data as a way of measuring school performance and altered the expectation on schools in relation to the provision of the wider curriculum. As previously discussed, this has created a further impact on school improvement, with schools directing strategies towards developing other subjects, such as art and design technology. However, while school league tables are published, schools will continue to focus on their English and maths SAT's scores and direct school improvement strategies towards improving their test results, due to the link between league tables, parental choice, and school funding.

2.2.3 Education Acts and influential reports
The Education Acts of 1992 and 1993, greatly influenced the direction of Ofsted inspections and therefore the direction of school improvement. Similarly, the White paper; *'Excellence in Schools'* (1997), influenced school targets for progress and achievement, now published in the form of league tables.

Education Acts continue to pressure schools to improve, with the *Academies Act 2010* (enabling publicly funded schools to have greater autonomy over their curriculum while remaining publicly funded) detailing the drive for more schools to move to academisation.   This initiative was arguably designed to give schools

greater autonomy and remove them from local authority control (and funding). In addition to schools who chose to join an academy chain, schools graded as 'inadequate' by Ofsted are currently required to be sponsored by a multi-academy trust. This has increased the pressure on schools to achieve a good grading in an Ofsted inspection, with the alternative being to join a multi-academy trust. It could therefore be argued that the rapid expansion of academies was also the focus of the *Academies Act* in 2010. While the debate over the reasons for encouraging academies continues, there is little doubt that school improvement is therefore further directed towards achieving a positive Ofsted grading.

The improvement of curriculum has also been influenced by external reports. For example, the *Independent Review into Personal and Social Education (PSHE)* in 2009, meant that some schools needed to develop their PSHE curriculum, and this would have influenced the direction of any school improvement at this time. Similarly, the *Rose Review* in 2006, identified that schools needed to teach synthetic phonics. This has impacted on schools as they are now required to teach a Department for Education (Dfe) agreed synthetic phonics programme. This had a significant impact on the focus of school improvement, with a focus on resources and training in a synthetic phonics programmes becoming a priority. I would suggest that expectations, such as requiring schools to teach from an agreed set of phonics schemes, impacts significantly on which improvement strategies receive the most funding within schools. It would also impact on the training and resources that schools fund as part of the school improvement drive.

2.2.4 Political initiatives and their impact on school improvement – a summary

In addition to Ofsted, league tables and Education Acts, departments such as the National College for School Leadership (an agency of the Department of Education formed in 2000) also impact on school improvement. Harris and Muijs (2005) note that The National College for School Leadership received funding greater than any other country to invest in training school leaders. While the National College for School Leadership focused on training headteachers initially, the focus of later years recognised the leadership of subjects and key stages that was being completed by teachers (called middle leaders). This level of funding from the Department of

Education will have influenced the direction of training and therefore leadership activities of school leadership at all levels. This and the impact of Ofsted, league tables and Education Acts demonstrates that the influence of political initiatives on schools is significant. Changes in practice resulting from these initiatives require staff training and a change to common practices. Therefore, the policies surrounding these initiatives will have significantly impacted on the direction of school improvement planning.

2.3 A definition of school improvement and school effectiveness

The discussion that follows will offer a range of definitions of school improvement and demonstrate the difficulty in finding one definitive description. It will also consider the definition of school effectiveness, as often this term is used interchangeably with the terminology, school improvement.

Offering a single definition of school improvement is challenging, as there are opposing views. This is mirrored in the literature with a range of definitions being offered. Harris (2014) defines school improvement as a 'relentless pursuit of improved educational performance and outcomes' and a 'preoccupation with finding new solutions, new ideas and new approaches' (Harris, 2014, p. 9). An alternative view is offered by Davies and Ellison (2003) who focus on the strategic direction of these solutions, and state that school improvement begins with 'strategic analysis, strategic intent, strategic planning and school strategy' (Davies and Ellison, 2003, p. 1). A similar focus on strategy and outcome is offered as a definition by Gray *et al.* (1999) who suggest that improvement is demonstrated through a school developing the outcomes of similar groups of pupils over time. Kelly (2001) is critical of this model of using outcomes, as it measures schools according to performance against ideals that 'presupposes that is what is important' (Kelly, 2001, p. 74). I would put forward that what is most important in one school, in one context, may be very different from what is most important to the community in another context. This means that to offer outcomes in a definition for school improvement is reductional and also needs to include all the other aspects of a school's remit to improving the lives of young people. This may include the impact that the school has on families,

mental health, enrichment, and aspirations as well as outcomes and educational performance.

While these definitions focus on academic outcomes, alternative definitions are offered and suggest a broader remit. For example, Hopkins (2001) offers what he considers to be a more common definition and focuses on the pupils. He states that school improvement is about improving the schools so that they become better places to learn. Barth (1990) recognises school improvement as a process that improves the culture of a school (through encouraging risk taking and encouraging diversity) and Mortimore (1998) contrasts this with a focus on improving learning and changing methods of teaching. However, Hopkins (2001) recommends that school improvement includes outcomes, capacity for change, and how learners learn.

There is criticism of those who offer pupil outcomes within any definition of school improvement. Harris (2014) considers that this can influence schools into focusing on improving the test scores of pupils over other learning and can even pressure schools into manipulating their data to evidence greater improvements. The challenge around offering a single definition of school improvement is further complicated by the debate surrounding a definition of school effectiveness.

Wrigley (2003) argues that school improvement and school effectiveness are often terms that are used interchangeably, and this further complicates defining school improvement.   This is because there is also some debate about what makes a school effective. Wrigley (2003) suggests that there is an overwhelming prioritising of measurable outcomes used to define school effectiveness. This is supported by Kelly and Downey (2011) who are critical of the narrow view of school effectiveness being measured by the 'progress students make in the academic, cognitive and scholastic elements of their schooling' (Kelly and Downey, 2011, p. 10). Mortimore (2001) notes that this has been mirrored in research, with researchers using small changes in exam performance as indicators of improved effectiveness of schools. Leithwood, Jantzi and Steinback (1999) are critical of these definitions of effectiveness, suggesting that they do not consider the context of schools and therefore do not increase the capacity of the professionals that work in them. Harris (2014) supports this view by considering how effectiveness, or school improvement

should be measured by the 'quality of teachers and the quality of leadership' (Harris, 2014, p. 18).

While a single definition of school improvement may be illusive, what is clear is that improvement of a school must be more than the measuring of academic outcomes. Hopkins (2001) recognises that a more holistic view of school improvement is needed, one that considers viewing the whole school and one that is inclusive in identifying the challenges of schools to enhance the learning of students. Then, Hopkins (2001) suggests expected achievements will be realised.

2.4 Challenges to school improvement evident in the school improvement literature

Much of the literature focuses on the challenges that schools face with school improvement, and the changes that need to be made to overcome these. In this part of the chapter, I will outline the challenges schools face, prominent in the literature. These will include the external influences on school improvement, collaboration, and teamwork, change and school improvement plans. The literature also considers how teachers have become leaders as a response to school improvement. This response will then be considered.

2.4.1 External influences

This discussion on external influences will consider how external pressures influence the need for change and their impact on accountability and on the outcomes of school improvement. External pressures could be defined as, government policies (such as league tables and Department for Education published guidance), in addition to external agencies, such as Ofsted and school improvement advisors (external consultants commissioned to help identify areas for improvement and ways to improve them).

Harris (2014) recognises the external pressures schools are under to change their policies and practices to improve, and Fullan (1992) acknowledges how school changes are influenced by politics. This is supported by Hopkins (2001) who agrees that the challenge for schools is to adapt to reforms that are externally controlled. This external pressure to improve is criticised by Gelsthorpe and West-Burnham

(2003), who suggest that Government policy does not motivate those within schools to make change. They propose that rather than acknowledging the reality of improvement as 'messy, complicated and emotionally frustrating' (Harris, 2014, p.11), policies emphasise, 'consistency, conformity and compliance' (Gelsthorpe and West-Burnham, 2003, p. 6). Harris and Muijs (2005) also raise the challenge associated with the constant reform in schools and how this can impact on teachers negatively after several years, potentially causing them to leave the profession. Thrupp (2005) offers an alternative view, and proposes that the policies themselves are the problem, due to a lack of consultation (with those who will put them into practice). Thrupp (2005) goes on to suggest that schools are unevenly supported to respond to these policies, because of the composition of individual school's local governing bodies. While there is no doubt that the skills of a Governing body can potentially offer challenge and support to leaders involved in the school improvement, I would argue that it is the leaders and teachers that work in the school that have a more significant impact. There will potentially be a differential between schools that are a part of a multi academy trust (a group of schools run by Trustees) who may or may not have a local governing body that supports the individual schools. I would put forward therefore that schools are impacted in different ways by external policies because of the many different challenges and support mechanisms that are in place.

Further to Government policy, are the external pressures that are outcome related. These outcomes are related to test results (previously discussed in 2.2.2). While acknowledging that schools recognise the broader role they play, Kelly and Downey (2011) accept that data is increasingly being used to drive improvement in schools. Hopkins (2001) questions the accepted outcomes because they are unchallenged. The targets are given as the expected standard and used to make comparisons, without question. Wrigley (2003) suggests that this is the reason that some schools seem to be more successful than others, because of the outcomes that have been externally defined as successful.

The external influence on school improvement extends beyond the need, or catalyst, for change. Ofsted, as a government agency, also impacts the direction of improvement in a school. Ofsted decides upon the criteria schools should follow to be successful and publishes targets that define how a school should move forward

and improve after inspection. This approach is criticised by Boothroyd *et al*. (1997) who argue that the focus of Ofsted is too narrow and has the potential to undermine school policies that might be more progressive. A criticism of this could be offered, as since 2019, Ofsted has changed its inspection schedule to focus on the wider curriculum. Ofsted would therefore argue that the narrow view criticised here, has been broadened. Ofsted stated in 2019 that they were moving away from a narrow focus on data, looking more at how teachers are teaching. This might still be criticised by Tomlinson (2005) who could argue that there is still a focus on standards, rather than considering how schools are structured within the context of their setting.

External agencies are also called on to make assessments of schools, and Harris (2014) requests caution at over relying on this form of accountability. She also suggests that written documentation from outside organisations is often taken 'as gospel' offering 'false hope' (Harris, 2014, p. 18). Mortimore (1998) agrees with proceeding with caution, due to some external agencies falsely claiming that they are objective. Leithwood, Jantzi and Steinbach (1999) support this view, offering that comparisons are made between schools by external agencies, and do not consider the context of schools or support schools to build greater capacity from within. I would suggest that this is the case, as often external agencies only see a small part of what a school achieves, and this assessment is made over a small amount of time. For example, some schools have been involved in mock Ofsted inspections. These reviews often take place over a day (as some Ofsted inspections do) or less and I would argue that this might make it difficult to gain a true picture of everything a school is offering to their communities in such a small space of time.

2.4.2 Collaboration and teamwork

Within school improvement literature, collaboration is widely viewed as the gold standard for school improvement (Harris, 2014; Kelly, 2001; Fullan, 2011) and ensuring schools are collaborative learning communities (Muijs *et al.,* 2004*)* enables strong improvement to take place. Hargreaves *et al.* (2010) argue that through strong collaboration, teams can be more efficient and work more effectively. Harris (2014) recommends how collaboration can offer schools new strategies to trial and

offer newly discovered knowledge. Holden (2002) and Sergiovanni (2000) consider the ability of schools to be professional learning communities as fundamental to their ability to develop and improve. Harris and Muijs (2005) define professional learning communities (PLCs) as where a school can ensure teachers have a shared vision, work together, and make decisions whose outcomes they have a collective responsibility for. Prengar *et al.* (2019) recognise that PLCs are good for enhancing learning, Vanblaere and Devos (2018) suggest they create collective responsibility for improvements and Schaap and de Bruijin (2018) believe they create a shared ownership. Beddoes, Prusak and Barney (2019) studied leaders in physical education departments and found that professional learning communities were able to influence change and culture. These studies could be criticised as while they provide a useful insight into the impact of this strategy on teachers, they do not offer a link between them and the impact on school improvement. It is difficult to see whether the impact of the professional learning community on, for example, culture or shared vision, then had an impact on developing an area of the school identified for improvement. However, building learning communities in schools is argued by Hargreaves (2002) as having a positive impact on learning in schools and Harris and Muijs (2005) conclude, from their literature review, that this as one of the components of schools with successful school improvement.

Johnson (2010) concludes that the stronger initiatives come from inside rather than from external sources. A potential criticism of this is, that some of the external sources identified by Johnson (2010) were not experienced in educational improvement. However, I would propose that in a struggling school with an inexperienced staff, external sources that have strong school improvement experience could be valuable.

However, it is the strength of these connections between individuals that appears most important in the discussion on school improvement. Hargreaves *et al.* (2010) argue that studies that identified high performing schools had leaders who developed the relationships between the team members and strengthened their relationships. However, Mortimore (2001) is critical of much of this research, as it is over reliant on examination outcomes. I would argue that schools work in a collaborative way, and this cannot be underestimated within any discussion about school improvement.

Understanding how colleagues work together, I would argue, is vital to consider, irrespective of data driven outcomes.

Hargreaves *et al*. (2010) also suggest that these teams (identified in the high performing schools) should be 'intimately connected' (Hargreaves *et al.*, 2010. p. 21). Fullan (2011) supports this view and argues that much of the reason schools do not improve their practice is because of the loose connections that are the outcome of some change in schools. He argues how schools often only encourage teamwork to share good practice or information. This lack of strength in relationships impacts on the longevity of any successful improvement. An alternative view is offered by Kelly (2001), who states that schools should direct their collaborations to those working outside of the school, in an organisation that is considered as higher performing. I would propose that schools working in different contexts and for differing communities may find sharing experiences and expertise interesting but fruitless. Suggesting that because a school is successful in an area, in a particular context with a particular set of staff, does not mean that they are the best suited to advise and benchmark those considered to be underperforming. Gelsthorpe and West-Burnham (2003) would appear to support this view, by suggesting that schools need to collaborate more with their communities (to bring about improvement) as there is little capacity within the school system to improve it. Hargreaves *et al*. (2010) would disagree, stating that you need to ensure that the change comes directly from those working in the system. I think that collaboration can be a successful way to share good practice and for colleagues to learn new skills from each other. However, the motivation to change must come within the school, from the teachers who need to make the changes.

2.4.3 Change

Robinson, Lloyd, and Rowe (2008) indicate that the changing capacity of a school is impacted on by its leaders. It could be argued that Mulgan (2000) offers a differing view, proposing that a 'top-down approach' (Mulgan, 2000, p. 134) has a negative impact on improvement. The top-down approach described could include school leaders, as well as the external pressures placed on schools. Alternatively, Fullan (2011) argues, that it is the pressure from finding solutions, which leads to

unsuccessful fragmented strategies that are too focused on individuals. Fullan (2011) argues that this is the reason for reduced success.

The suggestion that school improvement approaches should include a strategy for strengthening the change capacity of the school, was offered by Hopkins, Ainscow and West (1994). Fullan (1992) offers an alternative view and argues that to ensure optimal change and improvement, leaders need to support staff to change their behaviours, understanding and beliefs. Alongside this, support should include both the technical and psychological, because change can cause staff to feel anxious and, initially, uncertain. Miles (1986) offers another view and argues that having someone who can champion the clearly outlined change, can have optimal results. Hopkins (2001) supports the idea that change needs to be well structured and therefore needs to consider change capacity (as he suggests that often change within education can be random). However, he goes on to criticise the changes in schools as 'little more than a quick fix' (Hopkins, 2001, p. 179). This implies that the pace of change is also important.

Hargreaves (1999) describes the change in schools as needing to be like growing a plant. The emphasis in this description is on the differing, important stages that take place over time. Similarly, Mortimore (2001) says that the pace of change in schools should be slow, as it is important for strategies to mature for them to be successful. Fullan (1992) supports this view, as does Harris (2001) who argues that the need for immediate change is a challenge schools face, resulting in a limited amount of time for maturation of strategies.

2.4.4 School improvement plan
The school improvement plan or school development plan is a document often used by schools to highlight their direction of improvement, and evidence of impact. It is also a prominent discussion within school improvement literature. Davies and Ellison (2003) describe how a school improvement plan offers a view into the future, highlighting strategies and operational objectives. They describe plans that describe potential school improvement which often allude to a linear path of travel with a 'measurable' outcome. However, Davies and Ellison (2003) argue that this reductional approach is a direct response to the pressure Ofsted places on schools.

This seems to be supported by the impact on improvement of political initiative described earlier in this chapter. Kelly and Downey (2011) criticise this reductional approach, as it seeks to look for correlations in data rather than offering insights into improvements. Hopkins (2001) and Fullan (1992) agree that this reductional approach to school improvement is unhelpful, due to the complexity that schools need to be skilled at managing. Fullan (1992) also argues that following a linear path can make change more difficult if the direction or strategy are invalid. I would suggest that school improvement strategies are rarely linear and in fact, take many different directions than those that might be planned for or expected. Therefore, this is an important area to consider in any research into school improvement.

School improvement plans can be, as stated by Davies and Ellison (2003), prescriptive, and this can limit opportunities to innovate, as concluded by Hopkins (2011). This is evidenced by Kelly (2001) who suggests that leaders only resource the strategies that they want to be successful. However, Hopkins (2001) recognises the pressures schools are under to improve and that schools are responsible for their own improvement. I would propose that the school improvement plan is perhaps a response to this pressure, and a response to the expectation for schools to be in control of their own development.

2.4.5 Teachers as leaders

In response to the pressure for schools to improve and be in control of their own improvement, teachers are given leadership responsibility for subjects or areas of the school. Harris and Lambert (2003) define this as teacher leadership. However, Wasley (1991) considers teacher leadership to be about the ability to influence others to change. Harris and Muijs (2006) identify therefore that there are several definitions of teacher leadership. For the purposes of this review, I am considering teacher leadership to be activities that are both within the classroom and outside of the classroom. This is in recognition that teachers are leaders within their own teacher spaces but also lead subjects in their schools, across classrooms and year groups. Teachers in my study also refer to leadership in this way, making this an appropriate response within this literature review.

Distributive leadership (a leadership style which also has a range of descriptions and definitions) could also be described as where leadership roles and responsibilities are distributed around the school staff team. Where this literature review discusses this leadership style, it is considering research that describes teacher leadership (teachers who are engaging in leadership activities such as decision making, introducing new initiatives, and supporting colleagues with an area of personal expertise) and where these professionals are attempting to bring about change for the purposes of development or improvement.

In employing teachers as leaders, schools are building capacity for change, and, as Harris and Muijs (2005) suggest, this is essential for schools to develop. Devos, Tuytens and Hulpia (2014) also support distributive leadership as an approach, as it enables teachers to become engaged in the decision making and process of change. This is supported by Lai and Cheung (2015) who found that teacher leadership enabled teachers to encourage curriculum reform and Gronn (2000) who argues that teachers who are invested in the development of a school have more impact.

Liebermann *et al.* (2000) argue that a key role of a teacher as leader is to support their colleagues with new strategies or ideas. This collegiate approach is supported by Little (1990) who considers how working together can support teachers with sharing ideas and improvement, through self-organisation. Macbeath (1998), Liebermann *et al.* (2000) and Katzenmeyer and Moller (2001) support this view and suggest that by distributing leadership among teachers, schools can build positivity amongst staff, building their self-belief in their professional responses. It could be considered however, that as Mireles-Rios and Becchi (2018) found, self-efficacy and teacher confidence can also be encouraged using other methods, such as through teacher performance evaluations. While there is an importance in building the self-confidence (Liebermann, 2000, Hunzicker, 2012), job satisfaction (Garcia Torres, 2018), professional identity and growth (Allen, 2016, Sinha and Hanuscin, 2017 and Wenner and Campbell, 2017) and improving attitudes of teachers (O'Connor and Boles, 1992) through developing teachers who are also leaders, this literature does not suggest whether this increased confidence improved the schools the teacher leaders worked within. Additionally, as Harris and Muijs (2005) debate, the results could be misleading as headteachers may give leadership responsibility to more effective teachers and I would agree that this could, in some instances, have

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impacted on findings of this research. Harris (2004) argues that further research into distributive leadership and outcomes is necessary, therefore, further insight into the impact of this emotional response to teacher leadership would be useful in the school improvement debate.

As a response to the limited research of a potential link between distributed leadership and impact on improvement, Heck and Hallinger (2010) completed a longitudinal study that researched the impact of changes on student outcomes. They report a relationship between student outcomes in maths and reading in the United States of America, and distributed leadership. Their research considered the leadership impact of those not in formal leadership roles (such as principals or headteachers) and included leadership responses such as resource allocation and decision making in their research. They also considered a number of stakeholders in their research (such as parents and students). The study could be criticised as using test data to evidence improvement, however, they also used teacher perception of improvement and considered contextual information (such as the size of the school). Muijs and Reynolds (2000) completed a large-scale project that considered the relationship between teacher leadership and teacher effectiveness. Their study used 240 observations of teachers (where effectiveness was measured), pupil data (including standardised tests and school level data) and interviews with teachers. They found that 'teacher leadership contributes to their effectiveness in a very positive way' (Harris and Muijs, 2005, p. 78) and that this in turn contributes to outcomes for pupils. In my experience as a school leader, I have seen evidence of where development of leadership has encouraged development of classroom effectiveness, potentially because of confidence building. However, I would also suggest that with allocation of leadership responsibility comes leadership professional development. In my experience as a school leader, I have found that this can result in improving not only the leadership skills, but the teaching and learning skills of a teacher. This will also impact on their effectiveness in the classroom and then potentially on the pupils' learning.

While distributive leadership may have been found to motivate staff and encourage collaboration, the literature has suggested additional benefits to the approach. Harris (2013) describes how distribution of responsibility and tasks enables the development of professionals and allows colleagues to facilitate this development for others. This could lead to positive change, and, as Sharratt and Fullen (2009)

recommend, provoke changes of practice and development. It could be considered that this change is more likely to be positive when a variety of experience and expertise is called upon to develop and improve a school. This was highlighted by Muijs and Reynolds (2011) who recognise the need for a greater number of skills sets to be identified and exploited in response to the rapid and complex changing needs of a school. Harris (2013) supports this view, due to the challenges associated with transforming an institution independently with a more individual, formal leadership approach.

While the literature argues that there is a positive impact of teachers as leaders on school improvement, challenges have also been identified. Arrowsmith (2007) has suggested that Headteachers find true distributed leadership a challenge when accountability for performance is perceived by them as ultimately their responsibility. Baecher (2012) and Reeves and Drew (2012) also recognise the stress caused for teachers in fulfilling their leadership roles. Harris (2013), Lumby (2013) and York *et al.* (2004) also highlight that there is a need for trust within any distributed leadership where collaboration is paramount. Harris (2013) considers how if this trust is abused, the power associated with leadership could be misused.

While the potential impact on pupils' outcomes and school improvement is strong, Dong *et al.* (2019) recognise, that the approach to researching teacher leadership has not changed since the 1980's despite the focus of teacher leadership changing significantly. Muijs and Reynolds (2011) and Harris and Muijs (2005) suggest that teacher leadership impacts positively on school improvement. There are also potential challenges for teachers with this increased pressure on teachers, identified by Wenner and Campbell (2017) in their review of the teacher leadership literature. However, teacher leadership remains the preference for many schools in England.

2.5 Chapter two conclusion

The literature suggests the challenges that schools face in school improvement, and offers ways to combat, or alleviate these pressures. They advocate collaborative working, clear strategy explanations, strong leadership, and a focus on the process of change. These ideals can be compared with the perceptions of teachers and whether teachers would advocate similar approaches. Muijs *et al.* (2004) conclude,

after completing a literature view into research of improving schools in disadvantaged areas, that the teachers view of the improvement strategy effectiveness impacted on their enthusiasm for the strategy. It was important to consider, within the data of this study, whether the challenges in the literature are therefore mirrored in teacher perceptions of improvement strategies and whether the teachers can offer solutions or new ways of working to overcome the challenges schools face.

The first part of the literature review has focused on the school improvement literature and the following chapter considers the literature related to Complexity Theory, including its use in school improvement research.

Chapter Three: Literature review – Complexity Theory

3.1 Introduction

The literature review is managed in two chapters. Chapter 2 considered the school improvement literature, and this chapter will consider the literature related to Complexity Theory. In this chapter I will provide a brief history of Complexity Theory and define Complexity Theory by describing and exemplifying its characteristics. In providing examples from my experience of working in schools, I will suggest how this theory is a useful lens in which to study education, social systems, and school improvement. I will support this with examples from the Complexity literature. I will also consider the limitations of working with Complexity Theory in the context of the education sector.

Complexity Theory has been used explicitly in health research (more than in any other public sector) and therefore, following the introduction to Complexity Theory, I will consider how the theory is used in health and educational research. I will then consider the educational research into school improvement that is pertinent to my study.

3.2 The history of Complexity Theory

Complexity Theory was developed as a full theory (rather than as independent characteristics, identifiable much earlier) because of the work of the Santa Fe Institute in the United States in the 1980s. Eidelson (1997) describes how Complexity originated as a theory within the physical and natural sciences. Cochran-Smith *et al*. (2014) recognise how Complexity has developed from areas such as evolutionary biology, quantum physics and cybernetics, since the 1950s. They also recognise how it developed as a mathematical theory and more recently has been applied to business management studies (in the 1970s and 1980s) and social science, including postmodernism (1990s) and educational leadership and management (1990s and 2000s). Although Complexity Theory has its roots within computer science and mathematics, it has been used within the social sciences

(particularly within health sector research where it has been identified as being used within the research methodology).

3.3 A definition of Complexity

Davis, Phelps, and Wells (2004) state that a single definition of Complexity Theory is not possible and recognise that at the very least, finding a definition is 'elusive' (Nunn, 2007). This is likely because, as Thompson *et al.* (2016) and Cilliers (2000) explain, there is no single definition of Complexity Theory.

For this thesis, I will therefore adhere to Cilliers' (2000) recommendation of providing a description of Complexity, rather than a definition. Providing a list of prominent characteristics, described with examples (relating in this case to education) will as Cilliers (2005) recommends outline the key features of Complexity Theory. These characteristics will therefore be identified for use in this study. The characteristics that I have identified for use within my study are, the system, agent and interdependencies, self-organisation, spontaneity, unpredictability, loose coupling, connectivity and interconnectivity, feedback loops, emergence, temporality, non-linear systems, the whole as more than the sum of its parts, bifurcation points and the state of equilibrium.

3.3.1 The system

Complexity Theory describes systems. In this study, the system referred to is always the school. Within the boundaries of this study, 'the school' is defined as being all the people and actions that occur within the school premises or associated with the roles of those who work within it. However, the study also recognises, that the 'school' responds to the needs of the local community and as such, reaches beyond the physical building as part of its remit within education. This extended view of the boundaries of the school is recognised in this study as vital in understanding school improvement. The school system definition therefore includes interactions with the wider community that are related to the role of the school and its stakeholders, recognising that the school system has reaches beyond the physical school building (and grounds).

3.3.2 Agent and Interdependencies

Complexity Theory suggests that each system has members or, as Cilliers (2000) describes, elements. These elements are identified by Hetherington in 2013, as agents who connect with interdependencies. For the purposes of this study, I will use the term agents and interdependencies to describe the elements or members of the system and how they relate to each other.

In a school system, the agents are the teachers, teaching assistants, leaders and all stakeholders that contribute to, or are associated with the system. Weick, in 1976, explored how agents interact with each in Complex systems, and Cilliers (1998) suggests that studying interactions between agents can expose what influences the agent's view of reality. It is therefore important to understand how agents interact to understand their reality of school improvement. These interactions can be described through the characteristics of Complexity Theory.

3.3.3 Self-organisation

Self-organisation, described by Cochran-Smith *et al.* (2014), Kershner and McQuillan (2006) and Morrison (2008) is an inevitable outcome of agents interacting with each other in a system. In schools, this is where agents work together (sometimes initially organised in a more formal way) to support each other and build relationships in an informal way. For example, a team may be formally created to plan together or to improve writing across a school. As relationships and connections increase, the team then breaks into smaller groups or pairs to support each other with other aspects of their roles. During planning sessions, a teacher may express concern about the layout of their classroom, so another colleague arranges a time for them to work on this together. Or, while working on a plan to improve writing, a teacher shares that their teaching assistant has not had any training in supporting pupils with dyslexia, so another staff member will offer to find time to support them with this. The agents begin to self-organise. This is exemplified in Figure 1 below.
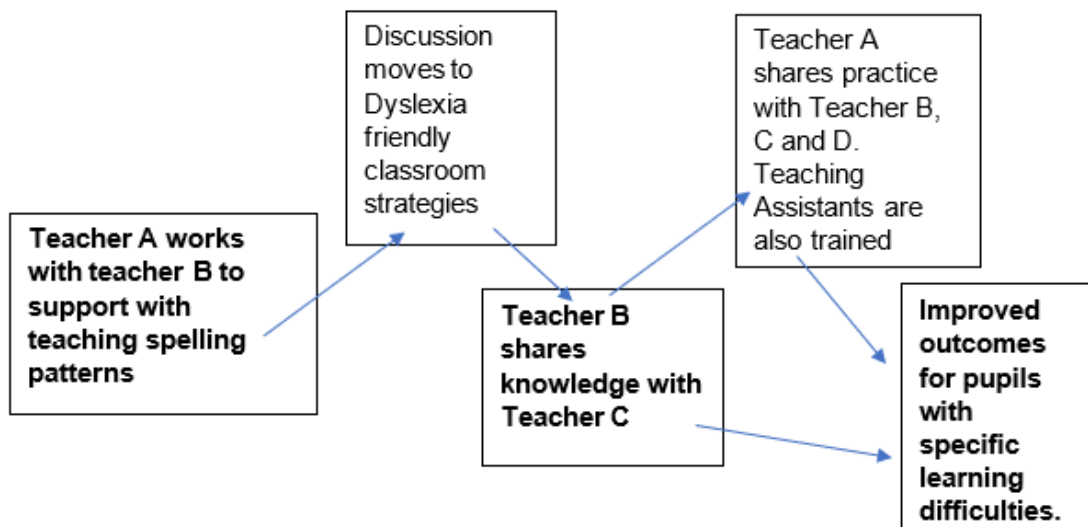
Figure 1: An example of self-organisation between agents in school.

Over time, self-organisation increases. It may also occur from less formal, or strategic starting points, such as meeting at interview, or meeting socially outside of school. Self-organisation of individuals has an impact on the system and on the school improvement journey.

3.3.4 Spontaneity

The interactions between agents, occurring through self-organisation, can often be spontaneous. This spontaneity (Northouse and Lee, 2016) evident in systems, is a characteristic of Complexity Theory. This is exemplified in Figure 2.
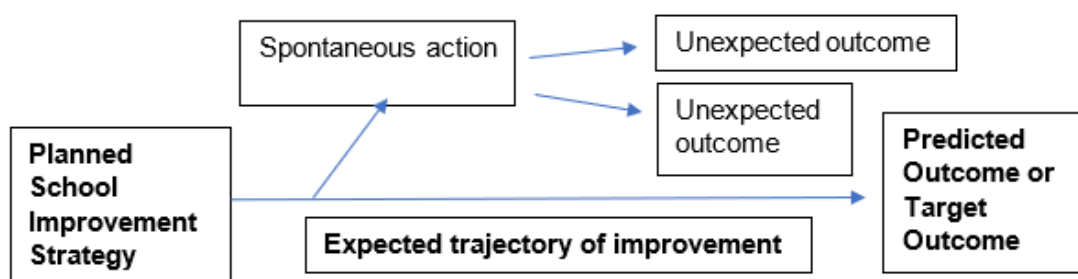
Figure 2: Spontaneous action impacting on outcomes in a system.

There are many spontaneous interactions or decisions that occur within the school day, that may impact on school improvement. For example, when a parent raises a concern with the Headteacher by the school gate and they respond quickly (without pre-determined goals and plans) or, after a senior leadership meeting where leaders are required to make a spontaneous albeit reasoned decision in response to an issue that requires immediate attention. Spontaneous actions happen throughout the day in schools and in classrooms. They may lead to strategic planning of improvement, but in the moment, they are spontaneous and potentially no less effective at bringing about change in a system. This is shown below in Figure 3. Figure 3 mirrors Figure 2 but provides an example for each of the events shown in Figure 2. The intended outcome to actions related to improving science outcomes in key stage 1 (years 1 and 2 in primary school) are extended due to spontaneous response from a parent offering to hold a STEM (science, technology, engineering, and mathematics) workshop. The spontaneous workshop (offered after strategies were planned) has an impact on the pupils that differs from what was expected.
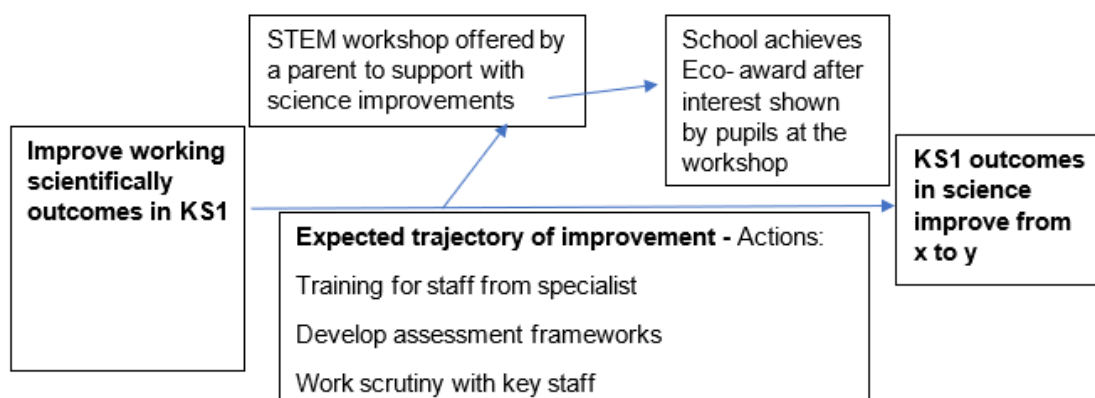
Figure 3: An example of spontaneity in a school system impacting on school improvement outcomes.

3.3.5 Unpredictability
The spontaneity needed in schools can make outcomes unpredictable. Unpredictability (Turner and Baker, 2019; Schreens, 2015, Stacey, Griffin, and Shaw, 2000, Geer-Frazier, 2014 and Wood and Butt, 2014) is a feature of Complexity Theory and is used to describe how systems can change in ways that cannot be pre-determined. Complexity theorists, such as Morrison (2002 and 2008), recognise the importance of unexpected events in understanding change in a

system. The number of uncontrollable variables within the agents own personal lives, make unpredictability, arguably inevitable.

School improvement often involves a plan with measurable outcomes. This model describes a cause-and-effect process and does not consider the unpredictability of a school system. Unpredictability impacting on a system is visually represented below in Figure 4.
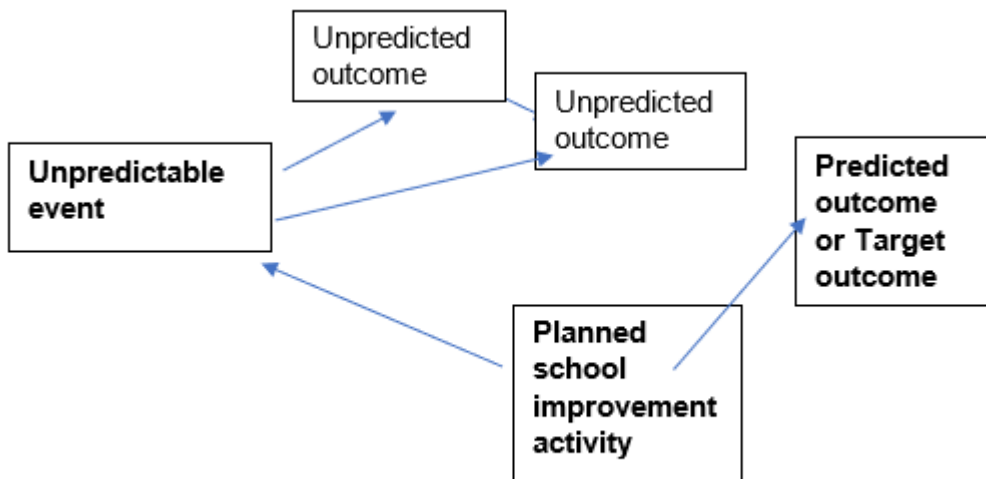
Figure 4: Unpredictability creates alternative unexpected outcomes in a system.

An example of unpredictability could be the recent Covid-19 pandemic as illustrated in Figure 5.
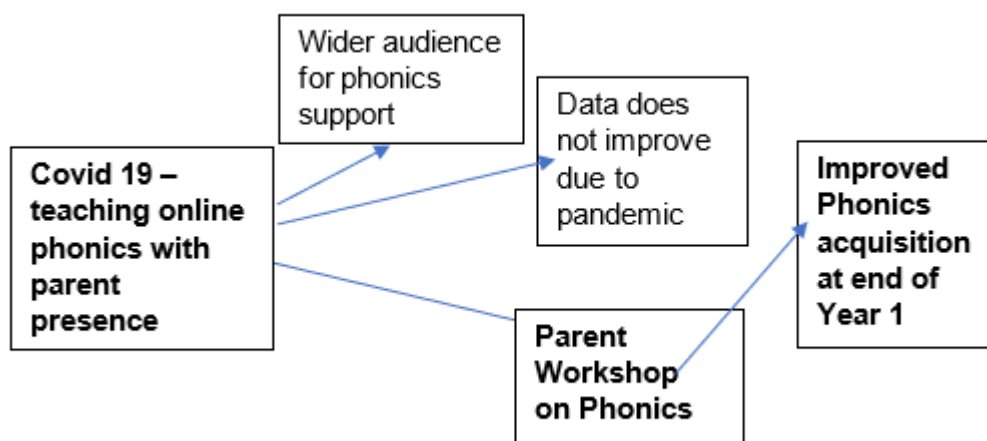
Figure 5: One impact of Covid-19 on a planned development in school.

However, there are unpredictable events that occur in school every day that do not relate to unexpected world events. For example, a workshop to parents about phonics may lead to a discussion about behaviour and routines at home (because of a parent recognising that they may not be able to support their child with phonics at home, due to poor routines). This may then lead to the parent getting support, resulting in the child's behaviour and home routines improving. This in turn, enables the child to come into school more often, on time and well rested. This type of unpredictable outcome could not be planned or measured, but similar occurrences are common. Examples such as these, demonstrate how outcomes in school improvement may be unpredictable.

3.3.6 Loose coupling

Observation of loose coupling can be useful in noticing patterns, particularly in 'structural relationships' (Beekun and Glick, 2001, p. 227). This characteristic of Complexity Theory describes how agents and interdependencies may make a loose connection or relationship, and Weick (1976) defines this as elements being loosely coupled. This then impacts on the system. The loose connection may not extend and last over time but may have other implications. Figure 6 illustrates how agents can be closely connected and loosely coupled.
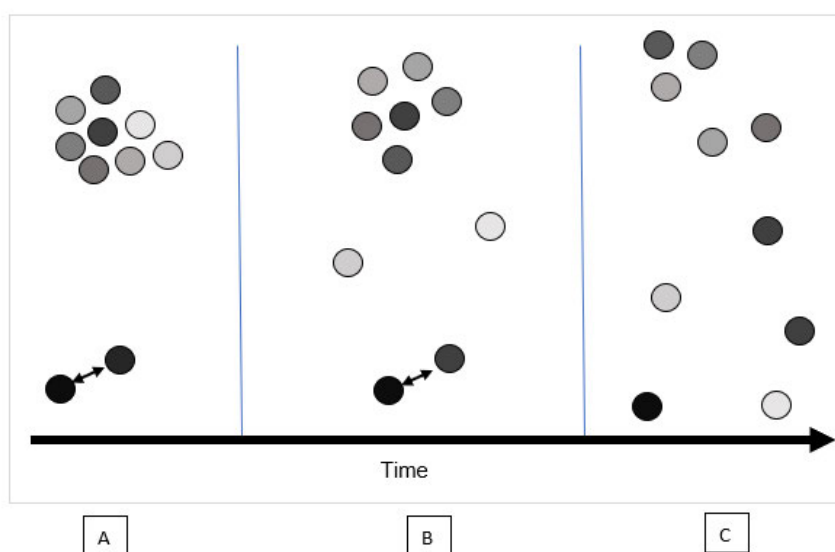
Figure 6: Agents in a system connected closely and self-organising over time.

In Figure 6 the x axis, time, is divided into three time periods, A. B and C. At the beginning in 'A', the two circles joined by the arrow are loosely coupled. In B they remain this way. In C the loosely connected pair have become disconnected. Also, in 'A' the group of circles at the top of the y axis are close together in proximity. These agents may have been brought together due to a formal school improvement strategy or have organised themselves in this way (self-organisation). However, over time ('B' to 'C') some of the agents lose their connectedness and a group of three agents remain closely connected.

An example of how this could occur might be when a working group is created across two or more different schools. The working group might be tasked with improving an area of the curriculum. This may encourage agents to work together for a short period. Initially, the group is closely connected; there may be agents who already know each other and are loosely coupled, as in 'A' in Figure 6. Over time, the relationships do not become strong and therefore become more loosely connected, as in 'C' in Figure 6. The connection does not continue; no self-organisation takes place.

The impact of loose coupling might be positive, negative, or neutral. This approach to working with other agents may suit some, however others may need stronger relationships to fully embed a new strategy, curriculum development, or change to their working practises. The closeness (or distance) of agent relationships are described in Complexity Theory as Connectivity.

3.3.7 Connectivity and Interconnectivity

Orton and Weick (1990) describe interactions between elements (in this study referred to as agents) in the system by looking at their connectivity or interconnectivity. Matthews *et al.* (1999) state that it is these internal and external connections that need understanding, to explain complex systems.

In a complex system connectivity or interconnectivity is prevalent. This is where individual agents connect with each other, or many agents connect with each other and become interconnected. In education, some connections between agents may be stronger than others. For example, two teachers that have worked in parallel year groups for a few years may be more connected than a newly appointed

governor and an early career teacher new to the school. Similarly, groups of agents may be more connected or interconnected. For example, teachers may be a group of interconnected agents, and the teaching assistants in a school may be interconnected. However, within these interconnections there will also be connectivity between a teacher and the teaching assistant they work closely with. This forms another point of connectivity. This is demonstrated in Figure 6, where the connectiveness is shown through the proximity of the agents (in this case, between teachers and teachers, teaching assistants and teaching assistants) but also using the arrows. The thickness of arrow also identifies those teachers and teaching assistants that have varying levels of connectivity within the system.
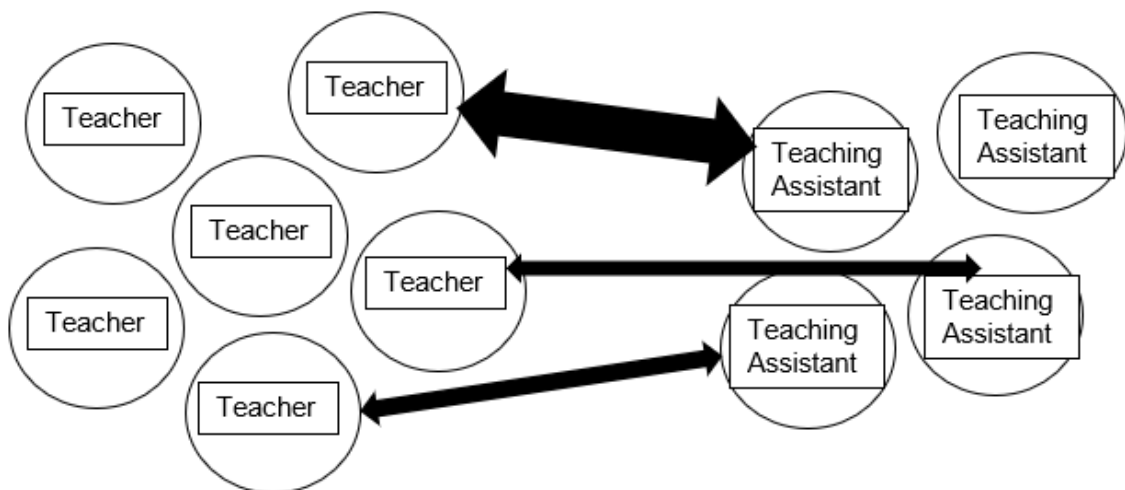
Figure 7: The varying levels of connectivity: between teachers and teachers, teaching assistants and teaching assistants and teachers and teaching assistants.

Another example of how connectivity is identified within school systems is how the school's special needs coordinator may be more strongly connected with the school educational psychologist than, for example, a teacher. However, part of their role is to support the connectivity between the teacher and educational psychologist to improve outcomes for pupils. Connectivity between agents may increase or decrease over time and may be revisited in the form of a feedback loop.

3.3.8 Feedback loops
In 1976, Weick described feedback loops as a common feature of systems that change. Feedback loops describe when information, interactions, or change are revisited. This can happen across the whole system or within parts of the system.

Cilliers (2000) describes how feedback loops can be direct or indirect whilst Weick (1976) explains that they are created through self-organisation.

It is recognised that there are regular changes within education, because of new research or political policy and teachers remember these changes and respond in different ways to them. School staff discuss strategies, developments, or policies that have come before and therefore understanding the interactions between the agents, interdependencies, and feedback loops, is useful in understanding the success of school improvement. This is demonstrated in Figure 8 below.

```
┌──────────────────┐   ┌──────────────────────┐   ┌──────────────┐
│ Children allowed │   │ Early years classroom│   │ Schools      │
│ to move freely   │   │ change practice to a │   │ move to      │
│ around the Early │   │ 'round robin' where  │   │ 'Continuous  │
│ years' classroom │   │ the teacher selects  │   │ provision'   │
│ selecting their  │   │ activities for each  │   │ model.       │
│ own play activity│   │ activity point and   │   └──────────────┘
└──────────────────┘   │ groups of children   │
                       │ move from one to the │
                       │ next in order.       │
                       └──────────────────────┘

            ┌──────────────────┐
            │  Feedback loop   │
            └──────────────────┘

            ┌──────┐
    ────────│ Time │────────────────────▶
            └──────┘
```
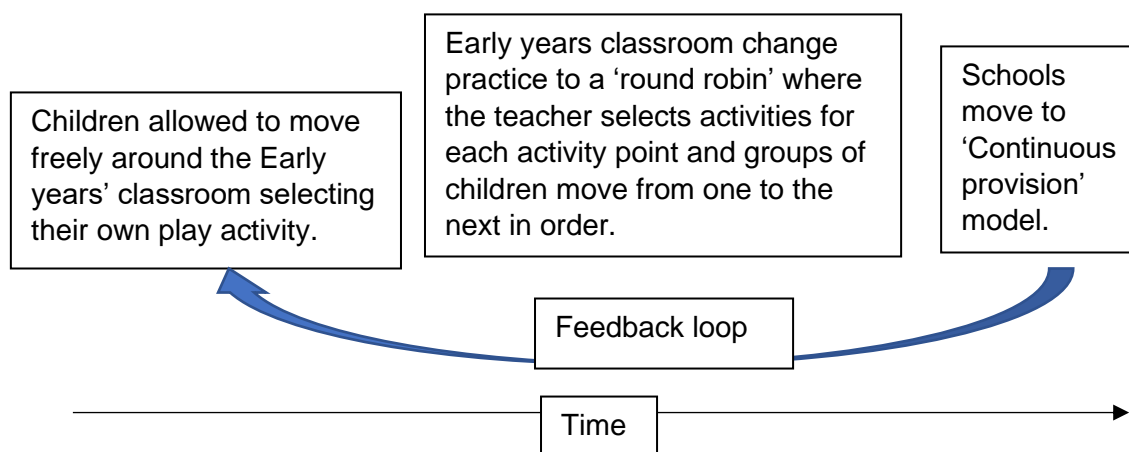
Figure 8: An example of a feedback loop in a school that is improving.

Figure 8 shows how in the early years classroom (the first year in many primary school settings) common practise was for pupils to move freely around the classroom, experiencing the play activities as they chose to interact with them. Over time, some settings changed their practise and the teacher created activities that were visited in turn, by the children, throughout the day (usually with the adult telling the children when to move to the next activity). This was called a 'round robin'. A feedback loop occurs in Figure 8, when over time, this practise reverted to one where the children were choosing their learning within the classroom. This is currently called continuous provision and is common practise in most early years' classrooms.

A feedback loop might also impact school improvement when a previous improvement strategy is revisited by agents attempting to mirror the successes seen previously. This idea would be supported by Marion (1999) who describes feedback loops as occurring when agents of systems are inter-connected.

Feedback loops in school are described in relation to school in a different way by Allen, Evans and White (2021). They suggest that a form of feedback loop in a school is when 'information generated by an interaction is then used for decision making' (Allen, Evans and White, 202, p. 19). Interactions can be positive or negative and can impact how a school (or teacher) makes improvements, in a positive or negative way.

3.3.9 Emergence

In a Complex system, changes emerge (Cilliers, 2000; Davis and Sumara, 1997) because of: self- organisation (Cochran-Smith, Ludlow, Grundoff and Aitken, 2014; Kershner and McQuillan, 2006; Morrison, 2008), spontaneity (Northouse and Lee, 2016) and feedback loops (Weick,1976). Complexity Theory describes change through the characteristic of emergence. There is an understanding that change is not always immediate but can develop and alter as the system adapts. How school improvement emerges, or develops and occurs over time, is a useful lens through which to understand system changes. Emergence is described by Cochran-Smith *et al.* (2014) as occurring dynamically, and by Davis, Sumara and Lace (2007) and Morrison (2008) because of learning from historical events. The characteristic that describes how time impacts on emergence within a system, is temporality. Figure 9 demonstrates how a school improvement strategy on reading may emerge over time.
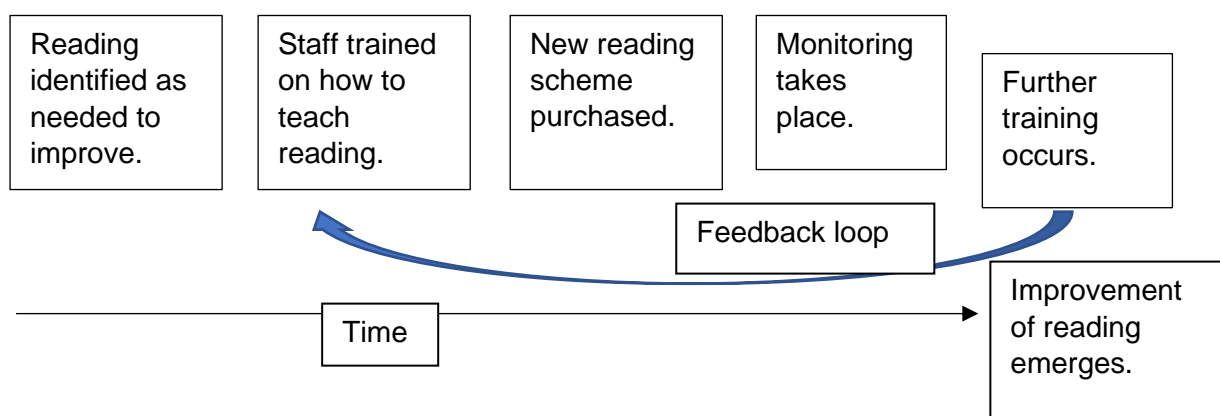
Figure 9: illustrating how improvement emerges over time.

In Figure 9, reading is identified as needing improvement (probably with a more specific reading focused outcome agreed). Over time, the improvement of reading emerges, following staff training and the purchase of reading scheme books (and a range of other strategies have also been employed).

3.3.10 Temporality

Figure 9 above shows how school improvement can occur over time and therefore illustrates one way that the Complexity characteristic of temporality is evident in schools. Complexity Theory recognises the importance of time or temporality (Nunn, 2007; Mathews, White and Long. 1999; Byrne, 1997). Change in a system occurs over time. In the case of education, these changes can be spontaneous and immediate, or can take time to embed and become common practise. A criticism of reductional models, used to measure school improvement, is that there is an end point or a point at which a target has been achieved. The characteristic of temporality therefore recognises the importance of time on a system change and recognises how time can alter outcomes long before, or after, the target or goal has been reached. Teachers will be experiencing the impact of time on school improvement initiatives and therefore it is important to understand the importance of temporality in teacher's perception of school improvement.

3.3.11 Non-linearity and The Whole is not the sum of its parts

The emergence of change over time is described by Complexity Theory as non-linear (Morrison, 2002). Unlike traditional reductional approaches to school improvement, Complexity Theorists (Turner and Baker, 2019; Cochran-Smith *et al.* 2014; Nunn, 2007; Morrison, 2008) recognise that systems are non-linear. Many of my previous examples, offered to describe the Complexity Theory characteristics earlier in this chapter, have demonstrated how the expected linear path of an improvement strategy can be interrupted, or the focus diverted, exemplifying the non-linear processes within a changing system (also illustrated in Figures 4, 5 and 8). These examples have also described another feature of a Complex system, that the whole (or outcome of a strategy) may not be the sum of, or the result of, the parts that were designed to create a positive change. Turner and Baker (2019) Schreens (2015) Cilliers (2000) and Davis and Samara (1997) all identified how, in complex

systems the whole does not equal the sum of its parts. For example, a school improvement strategy into improving parental engagement with the school may also, improve attendance figures, reduce the number of recorded behaviour incidents, or increase reading performance (as more parents choose to engage with reading at home). Alternatively, school improvement strategies may not have the impact expected; the whole becomes less than the sum of its parts. The parts of the strategy could be, an investment into purchasing a maths intervention, training of staff to run the intervention, resources created to support the intervention, and time out of class for pupils to take part in the intervention. If the strategy does not have a positive impact on mathematics for these pupils, then the outcome, or the whole, is less than the sum of its parts.

3.3.12 Bifurcation point – state of equilibrium

In the previous examples (provided to describe the Complexity characteristic, the whole is more, or less, than the sum of its parts) there would need to be a point at which the change began. This is described by Byrne (2005) as the starting point. In the example of the maths intervention, a teacher or school leader is likely to have noticed underperformance in mathematics of a group of pupils. In the example of improving parental engagement, an agent would have identified that all or some parents were not engaging positively with this school. It is this point, where a change is perceived to be needed, that Complexity theorists, such as Kershner and McQullan (2016) and Smith (2013) describe as the bifurcation point. It is the point at which something occurs to stimulate a change.

It is argued, by Complexity theorists, that leading up to the bifurcation point there is a state of equilibrium. The state of equilibrium is when there is a balance and calm in a system. In the example of the maths intervention (in the section entitled 'non-linear and the whole as more than the sum of its parts) this would be the time prior to an agent noticing a need for change. Kershner and McQullan (2016) and Smith (2013) suggest, that change in a Complex system occurs when a state of equilibrium is challenged. White and Levin, 2016 support this view, that change cannot occur unless the equilibrium is disrupted. These characteristics are illustrated in Figure 10.

41
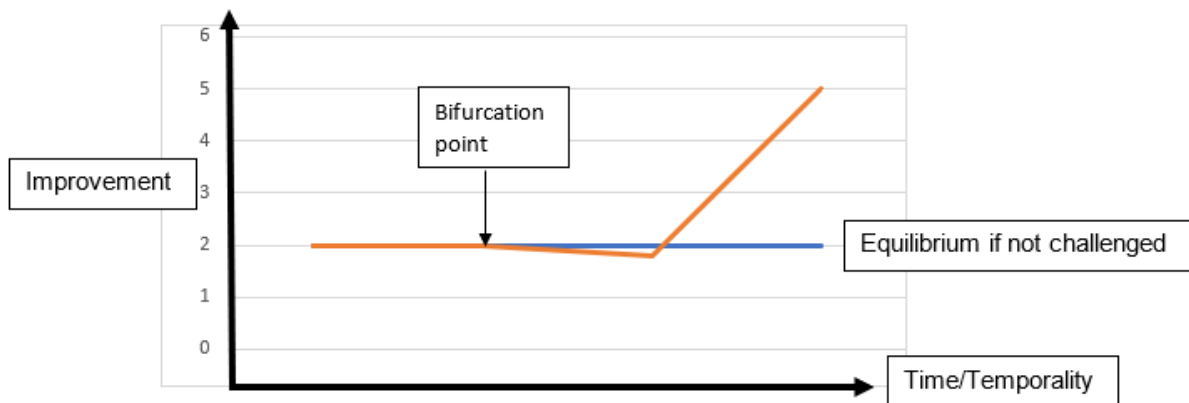
Figure 10: The state of equilibrium and the potential impact of the Bifurcation point on school improvement.

In Figure 10, the *x axis*, time, is parallel to the line of equilibrium (where there is no change) and the improvement line, up until the Bifurcation point. The *y axis* determines the level of improvement of an area of the school. The line of improvement in this illustration is impacted on by the bifurcation point, where it initially shows negative improvement and then improves in an upward trajectory over time. Figure 10 therefore, illustrates when an improvement strategy has a positive (rather than negative or neutral) impact on an area of the school.

3.4 Complexity theory and its limitations for use in educational research

The limitations of Complexity Theory are used by Complexity theorists, such as Cilliers (1998) and Hetherington (2013), to describe and define Complexity. Therefore, these characteristics are also important in the description of the theory. The limitations that I will discuss are Complexity reduction, morality, reductionist, and Complexity as a prescriptive theory.

3.4.1 Complexity reduction

Hetherington (2013) identified Complexity reduction as a limitation and characteristic of Complexity Theory. Hetherington (2013) defines a complex social system reduced by the creation of artificial boundaries, as reduction. Complexity theorists would be critical of complexity reduction and the impact it might have on any study

that uses Complexity because of the boundaries that are created in research and how these boundaries may prevent study of the whole system.

Biesta (2010) argues that participant sampling, prevalent in the research process, reduces the number of options for elements to interact. Biesta (2010) also suggests that the constraints placed on language (through the research process) also creates a reduction in Complexity. This would lead us to the conclusion that Complexity reduction prevents the researcher seeing the whole picture. However, Fenwick (2010) offers an alternative view, stating, that if we see the whole as being more than the sum of its parts, 'the less-than-whole cannot simply be assumed to be the reduction or suppression of these parts' (Fenwick, 2010, p. 58).

Another alternative viewpoint is given by McDaniel (2001), who states that trying to make sense of a system, requires interactions, and these interactions themselves will create 'new uncertainties and ambiguities' (McDaniel, 2001, p. 25). This supports Hetherington's view (2013), that rather than working in opposition, emergence and complexity reduction are working 'at the same time' (Hetherington, 2013, p. 74). I would suggest that by interacting with the elements of the system, the researcher is part of the system, supporting emergence (in this case of data), rather than reducing it.

Gear *et al.* (2018) recognise the conflict between the Complexity perspective and the preconceived ideas of the researcher. The previous experience and knowledge of the researcher could reduce their ability to see the Complexity of what is being researched. Therefore, the use of a theory within research design could be argued as challenging for a Complexity researcher (Jordan *et al.,* 2010). However, Kincheloe (2007) states that all researchers are boundary makers and therefore all researchers will impact on their data. I would argue that in a Complex system, Complexity will prevail and flourish because of, and despite, the interactions between the researcher and those being researched. Therefore, boundary makers will be unable to limit the outcomes using the theory in the research design. If systems are viewed from a Complexity perspective, then as Hetherington (2013) argues, the boundaries set will not limit the infinite range of interactions to be studied. Cilliers (1998) offers an alternative view and argued, that reducing a system to smaller parts, does not, from a Complexity perspective, make it any simpler.

3.4.2 Morality

Alhadeff-Jones (2008) and Morrison (2010 and 2008) suggest that, with Complexity Theory's origins in the physical science, this theoretical lens is unable to consider concepts such as good, bad, desirable, and undesirable. They therefore argue that Complexity Theory cannot contribute to positive change about societal issues, where a focus on ethics and morality is imperative. It could be argued that Complexity Theory is therefore not a suitable lens through which to study social science. Additionally, Cilliers (2000) offers another limitation, that Complexity Theory can only offer part and possibly not all the information about a system.

3.4.3 Reductional

Evolving from the physical sciences has also meant that Complexity Theory is defined using a 'set of identified components' (Alhadeff-Jones, 2008, p. 77). This approach can be seen as reductional (an ideology that Complexity distances itself from) and narrows the perspective through which observations can be made. Morrison (2008) agrees, arguing that while Complexity Theory appears to reject positivist ideologies, it creates its own uniformities through listing key concepts (described in my study as characteristics), such as emergence or self-organisation.

3.4.4 Complexity Theory as a descriptive rather than prescriptive theory

Alhadeff-Jones (2008) and Morrison (2008) further propose caution when using Complexity Theory as a prescriptive theory and suggest that it is useful only to describe social systems, rather than explain them. However, Cochran-Smith *et al*. (2014) argue that the theory has been used successfully to describe ways of organisational change and can therefore be used in a descriptive and prescriptive way. I would propose that in using the theory to engage analytically with data does not require the researcher to offer solutions to problems. If the characteristics of Complexity Theory were noted to offer possible solutions, this could be offered tentatively, with an understanding of context and temporality of the study.

3.5 Limitations of Complexity characteristics

Complexity Theory is presented in the literature as a theoretical structure that has its limitations for use in research and to describe social systems. This part of the chapter will explore this further.

3.5.1 Self-organisation

Self-organisation is a characteristic in Complexity Theory that is criticised by Morrison (2010) due to the potential it has, to be destructive within systems. An example of the destructive nature of self-organisation is provided by Solow and Szmerekesovsky (2006) who discuss the impact of this characteristic in prisons. Solow and Szmerekesovsky (2006) explain how, if prisoners were allowed to self-organise without boundaries, rules and regulations placed upon the inmates, the outcome could be destructive. Therefore, it is recognised that self-organisation might be counter-productive within systems, and as Morrison (2010) suggests, could cause inefficiency and a lack of direction.

3.5.2 Unpredictability

It has been argued that Complexity Theory cannot offer prescriptive solutions given its own description of unpredictability (Cochran-Smith *et al.*, 2014; Morrison, 2008). If systems cannot be predicted then they cannot, by definition, be generalised and solutions given. Morrison (2008) considers therefore whether Complexity is useful as a theory. Cochran-Smith *et al.* (2014) address this concern with identifying the importance of small-scale study in educational research. They argue, that while large scale generalisations cannot be made about the results from a small-scale study, there is value in considering how the findings of a small-scale study can be used in other contexts by ensuring there is good understanding of the findings and research methods. They explain that often these studies, while too small to make generalisations, can offer an insight into 'specific circumstances' (Cochran-Smith *et al.*, 2014, pp. 18) and are therefore still valuable. In a similar way, research that uses a lens of Complexity can offer insights such as those offered in small research studies. Byrne (2002) also addresses this criticism of Complexity Theory. He argues that rejecting a linear cause and effect process is different to rejecting the idea that everything has a cause. Cilliers (2000) also acknowledges that emergence is not random. Therefore, it is possible to research reasons for outcomes.

3.6 How has Complexity Theory been used as a methodology in Health research?

Although originating in the physical sciences, Complexity Theory has been used more recently within social sciences and most prominently in the design of health

interventions. McDaniel and Driebe (2001) identified how Complexity Theory could be used in healthcare managerial processes, and since then, the use of Complexity Theory has become more widespread. Brainard and Hunter (2016) completed a review of health care research to determine whether the use of Complexity Theory can be advocated. They state that Complexity is used and recommended when designing health care delivery systems but that there is less clarity on how Complexity was used to support health research.

Brainard and Hunter (2016) found that out of a total of 5248 academic papers focusing on health research, 22 health interventions identified features of Complexity. Of these, most recalled positive outcomes, although only one health intervention was designed specifically with Complexity Theory at the forefront. They recognise that the cause and effect of interventions remain difficult to exemplify in complex systems and that while useful to evaluate interventions, there was limited evidence that Complexity Theory is a suitable approach when designing Health research. Brainard and Hunter (2016) did recognise how Complexity Theory is able to describe the nature of 'real-life situations' (Brainard and Hunter, 2016, p. 2) but that more objective led measurement of outcomes is needed to ensure Complexity Theory is used more widely in the future.

In contrast, Thompson, Fazio *et al.* (2016) demonstrated how they found Complexity Theory to be used as a framework in 44 healthcare research papers. They concluded that of the research they reviewed, most collated qualitative data, and were case studies, although there was some evidence of quantitative studies that were mainly exploratory in nature. Some research projects used Complexity to describe phenomena and to explain unpredictable changes within the system. The authors conclude that Complexity is being used more regularly in healthcare research. However, the absence of an agreed theoretical approach creates difficulty in using Complexity to inform research. They also identified that a significant limitation was there being no agreed definition and description for Complexity.

The absence of definition or incorrect interpretation in defining Complexity characteristics is a criticism of Paly and Eva (2011). They use the characteristic of self-organisation as an example. They suggest that healthcare researchers have incorrectly related self-organisation as being evident when individuals come together

to create a plan or agree their intentions. However, Paley and Eva (2011) argue that this is not an accurate interpretation of the characteristic, as the absence of a leader is irrelevant. They argue that Complexity Theory recognises that there is no plan, or manager, and therefore this characteristic is being incorrectly identified. Therefore, Paley and Eva (2011) offer an alternative view, that Complexity Theory is not suitable for use in healthcare or in social science. They argue that its use has several flaws, not least the presumption that the systems discussed are complex. They are also critical of studies that use Complexity, as they make 'no effort to measure the extent of the influence exerted by the factors or characteristics' (Paley and Eva, 2011, p. 271).

Tuffin (2016) offers a contrasting view, that Complexity Theory could be useful to answer problems that the health sector has been trying to resolve for many years. Tuffin (2016) provides an example of how, by understanding the complexity of relationships and factors that influence people's health, professionals might begin to understand patients' behaviour. For example, what has previously been suggested as patients being resistant to changing their behaviours by reverting to old habits, could now be understood through Complexity, by looking at the complex system the patient is within.

Chandler *et al.* (2015) published a research paper that considered the reduction of fasting times in the case of facial surgery. The authors wanted to apply the core concepts of Complexity science (including self-organisation, temporality, and emergence) to explain the findings of the study. They found that through self-organisation, patients' behaviour emerged, not because of their individual perceptions but because of the connections they had with others. They also found that patients did not have a view of themselves in the whole system. Due to patients experiences their behaviors could not be reversed and this demonstrated why the recovery could be stable and unstable at times (described using the characteristic of equilibrium). Chandler *et al.* (2015) concluded that because of the ever-increasing complexity of nursing and of complex health diagnosis, Complexity Theory is a useful way to explain these systems. They recognise that people are defined by their relationships, and they identified these using Complexity characteristics. This demonstrates that Complexity is a useful way to study groups of people and can be

used to explain how people perceive the world and the impact this has on their actions.

Braithwaite *et al.* (2017) recognised in their study, the increasing popularity of Complexity science in healthcare research and its potential for application in healthcare. In the review, the authors aimed to identify and analyse the characteristics of Complexity in much the same way as Chandler *et al.* (2015). Characteristics that they recognised included agents, interactions, self-organisation, feedback loops, scales of the system, and the impact of temporality. The paper recognises the significance of using a non-linear theory in healthcare research. According to this White paper, using a non-linear theory is important because healthcare research aims to understand the 'underlying dynamics' rather than 'the specific parts' of a system (Braithwaite *et al.*, 2017, p. 5). The paper concludes that approaching healthcare research in this way, will offer better solutions to problems in by factoring in Complexity features.

Plesk and Greenhalgh (2001) summarise the discussion, with a description of modern healthcare. They recognise the Complexity of a multidisciplinary approach that is now common in treatment plans. They suggest that this is because agents (patients) are interacting with others, elements in the system are unpredictable, and behaviours alter according to small changes, suggesting that the system is therefore non-linear. They conclude by recommending that linear models should be abandoned to offer more flexibility to researchers in health sector research.

While there is still some debate surrounding the limitations of using Complexity Theory in health research design (due to an absence of an agreed approach and definition) it has been recognised as being beneficial in comparison to more linear approaches to research. It is therefore imperative that moving forward a clear definition is established (using the key features of Complexity Theory) for use in any methodological approach that describes how Complexity Theory will be used in the research design and data analysis. This has been addressed by Gear *et al.* (2022) who defined Complexity using the characteristics of self-organisation, interaction, emergence, and co-evaluation. Although Gear *et al.* (2022) have yet to complete their research, they have designed their approach to use these characteristics to

identify patterns in intimate partner violence in New Zealand. They have suggested that Complexity Theory will be a useful way to approach this complex problem.

3.7 School improvement literature and Complexity Theory

Allen, Evans and White (2021) consider the use of Complexity Theory in their exploration of school improvement because the theory supports the understanding of changes in behaviour and structure (for example, they use the characteristic of unpredictability to describe the quick decisions made by stakeholders throughout the school day). They recommend that it can also describe the emergent nature of the school system. Muijs *et al.* (2004) also suggest that schools working in disadvantaged areas are faced with complexity that is difficult to articulate. I would propose therefore, that a theory that embraces this complexity might be useful in considering how these schools experience development and improvement. However, in considering the school improvement literature, I would argue that there are limited papers that outline the intention to use Complexity Theory in the research design, method, or analysis. However, Complexity Theory is recognisable in the literature, as the characteristics can be identified in the findings of these papers. In this section of the chapter, I will now determine how Complexity characteristics can be identified in the school improvement literature, when this may not have been the authors intention. This is achieved by identifying key Complexity characteristics within research papers.

3.7.1 Agents and self-organisation

Sleegers *et al.* (2014) completed a longitudinal study in America that identified teachers as the agents of change in improvement strategies. They conclude that alongside teachers' enthusiasm for professional development and their engagement in improvement, collaboration with colleagues impacted on the school's capacity for change. Teachers being able to 'work together to solve problems' (Sleegers *et.al.* 2014, p. 617) is a recommendation of the study. This is supported by Stringer (2009) who identified 'connectedness' (Stringer, 2008, pp. 153) between teachers as being vital in the improvement process. Here Sleegers *et al.* (2014) and Stringer's (2008) studies intentionally identify the Complexity characteristics agents and connectiveness as being important in the school improvement outcomes.

Coburn, *et al.* (2012) focused on the area of teacher interaction and found that the developments of networks between colleagues are crucial in school improvement. They found that teachers who were able to continue to develop the strong ties they had made with colleagues (because of professional development opportunities) continued to have a 'high level of expertise' (Coburn *et al.*, 2012, pp. 157 – 158) ensuring that the improvement strategy was sustained. Where these agents had weaker ties, the improvement was not sustained.

The importance of collaboration between agents is supported by Harris (2001) who also recognises communication (between agents) as important. She identified how strong communication improves the opportunities for teachers to work together, and that collegial working is optimal for high performance. Goldenberg (2003) supports this view, suggesting that enabling relationships to flourish between colleagues is a potential way for successful and sustainable improvement. Goldenberg (2003) argues that this can be achieved by ensuring colleagues are allocated time to work together to review goals and outcomes. Here, Harris (2001), Goldenberg (2003) and Coburn *et al.* (2012) argue how teachers working together is important in school improvement. This can be recognized as the Complexity characteristic connectiveness.

When agents collaborate in an informal way, they self-organise. This is identified by Wenger (1998) when discussing how colleagues create subcultures. In creating these subcultures Wenger recognises that the members of the system create an understanding that enables them to change and evolve over time. The creation of subcultures (identified by Wenger, 1998) could be considered as the Complexity characteristic self-organisation as the teachers are arranging themselves into smaller subculture groups. Benoliel and Berkovich (2017) identify that an effective way of improving a school is by creating teams that work together. However, they also identify the importance of changing relationships over time (as described by Wenger, 1998). They suggest that is only when a team loosens its boundaries and opens to other colleagues (or begins to self-organise) that the change or opportunities for improvement can be most effective. They consider that this process is different from colleagues being 'loosely coupled' (Weick, 1976 cited by Benoliel and Berkovich, 2017, p. 922) as they consider this is better exemplified as being when teachers work as individuals most of the time. This is criticised by Solow and

Szmerekesovsky (2006) who argue that self-organisation can be counterproductive in social systems. Therefore, they might criticise this research as not identifying where the self-organisation or loose coupling had a negative impact on the school and on school improvement.

It is evident from the literature that studies into school improvement recognise the importance of individuals and how they connect to each other. This exemplifies the agents and self-organisation characteristics of Complexity Theory.

3.7.2 Loose Coupling

Complexity Theory describes how agents in the system can be loosely coupled or loosely connected. Goldenberg (2003) argues that schools are complex and that they are made up of 'interpenetrated and interdependent subsystems' (Goldenberg, 2003, p. 10). The description of these subsystems by Goldenberg suggests that they are therefore either connected or loosely connected. Those subsystems which are loosely connected could be seen as an example of loose coupling. This supports the view that loose coupling will effect parts of the system and therefore will impact on school improvement strategies. In support of Goldberg's (2003) view, Leithwood's (2016) review of leadership literature and school improvement, identified two types of collaboration: formal (within departments) and informal (between departments). Leithwood (2016) concluded that while collaboration within departments (in Canadian high schools) had a high impact on improvement, the collaboration between individuals from differing departments can enhance the opportunities for improvement. This describes how the loose coupling between agents can impact on the school system.

Lee and Seashore Louis (2019) propose how a strong school culture, built on trust and respect between colleagues, had a high impact on sustaining school improvement in America. Using a large study (3,983 teachers surveyed), they identified that when teachers loosely coupled and worked together, sharing a reflective dialogue about their practise, school improvement could be sustained. The importance of agents working together in a feedback loop of trust and respect was also recognised. This is mirrored in Muijs and Harris' (2006) study where they identified how teacher leadership (where teachers led the professional development)

created formal and informal groupings to successfully bring about improvements. These informal groupings would suggest that there is evidence of the Complexity characteristic of self-organisation and loose coupling. It determines that this impacts positively on school improvement.

3.7.3 Feedback loops

Complexity Theory describes feedback loops in systems. These are where systems or agents in a system revisit historical interactions or actions. Feedback loops of trust and respect were also recognised by Demerarth's (2018) study into high performing schools. Demerarth (2018) recorded how continuous feedback loops of intentional shared meanings between colleagues (about their confidence to solve problems together and positivity around pupil achievement) created a robust school culture that ensured improvement was sustained. Alternatively, Goldenberg (2003) describes a different form of feedback loop: one where teachers come together to discuss student learning continuously, rather than scheduled as an event only three times a year. Goldenberg (2003) considers this to be a vital feedback loop in the school improvement process.

3.7.4 Bifurcation point

Complexity Theory proposes that systems have a point at which change begins to occur. This is the bifurcation point and occurs after (or simultaneously with) a stimulus for change. Dag and Gumuseli (2011) suggest that schools need external pressure to begin their improvement journey. They recognise that this can have both a negative and a positive effect. This view contrasts with Harris (2001) who states that change is generated from inside the school and is also driven internally. However, Stringer (2009) identifies that schools will have a bifurcation point that stimulates improvement, or as she states, a point at which there is a collective and systematic need for the equilibrium to be challenged. Goldenberg (2003) recognises both views, stating that 'productive change' (Goldenberg, 2003, p. 10) occurs with initiatives that are a mixture of school-based and government led change. Dag and Gumuseli (2011), Stringer (2009) and Goldenberg (2003) have all identified a point in the school improvement emergence where change occurs. This could be characterised by the Complexity characteristic bifurcation point.

3.7.5 Non-linear systems and temporality

In both papers, Goldenberg (2003) and Feldhoff *et al.* (2015) discuss how after an initial moment of change, schools can take different routes over different time periods. This mirrors the Complexity characteristic of non-linearity. Feldhoff *et al.* (2015) recognise how improvement can happen in many ways, over a variety of time periods. For this reason, they focused their review on longitudinal studies. However, they suggest the limitations of their review, as most of the studies could not confirm long term affects of the changes put in place. Identifying the impact of time on change implies the importance of temporality in system change is also reflected in Complexity Theory.

In much of the literature that focuses on school leadership and school improvement, school leaders are recognised to impact on school improvement. Gray, Glodstein and Thomas (2003) acknowledge a leader's impact and recognise how some leaders will offer 'quick wins' (Gray, Glodstein and Thomas, 2003, p. 87) to show improvement in the short term. They also state that much of the literature measures school improvement over a limited time frame and therefore leadership styles that create short term improvement have often been favoured in education. Therefore, it is either important to understand what improvements occur over time, or it is important to recognise that perhaps improvement happens in short 'bursts' (Gray *et al.* 2003, p. 88) rather than longitudinally. Gray *et al.* (2003) considers therefore that the presumed linearity of school improvement is not accurate. This also reflects the view of Complexity Theory; that system change is non-linear and is impacted by temporality.

3.7.6 Summary of where Complexity Theory is identifiable in the school improvement literature

Although those researching school improvement did not outline their intention to identify the characteristics of Complexity in their findings and discussions about improvement, I have demonstrated how the theories characteristics are identifiable. I have also identified how those writing about school improvement have shown them to be important aspects of how a school develops over time. This supports the view, that Complexity is a useful lens through which to discuss school improvement.

While Complexity Theory characteristics can be identified in some of the school improvement literature, other types of strategies have also been identified. It is these strategies in the school improvement literature that I will now discuss.

3.8 The features identified in the literature as impacting positively on school improvement

In addition to research papers where Complexity Theory can be identified there are other factors that impact on school improvement within the literature. These include professional development, teacher emotions and community collaboration. These are now described in 3.8.1 – 3.8.3.

3.8.1 Professional Development

Many of the studies (Lee and Louis, 2019; Hargreaves and Hopkins, 1994) identify teachers' professional development as being vital in the school improvement process. Dag and Gumuseli (2011) take a more holistic approach and suggest that teacher growth is important (and this includes professional development or training). Muijs and Harris (2006) also recognised that teacher training and development was important for improvement, however they propose that it needs to be innovative. For example, they argue that teachers should attend training usually reserved for leaders. They also identified examples of Coaching among staff, that was successful in bringing about change. Muijs and Harris (2006) conclude that it is important for teachers to feel involved in any school improvement strategy, so I would suggest that this requires there to be a focus on the teachers as leaders when considering school improvement strategies.

Hargreaves and Goodson (2006) consider an alternative view, that encourages investment in professional development, but recommends that this should be school specific rather than related to 'model schools' or examples of good practice. They also consider the experienced staff's role in the improvement, encouraging improvement strategies to recognise experienced staff's strengths. Taking a historical view of school improvement is therefore seen as an important role in the school improvement challenges.

Halinger and Heck's (2010) longitudinal study (over four years) surveyed teachers and collated pupil performance data. One of their conclusions identified that collaborative leadership formed strong professional development opportunities. This

then created opportunities for sustainable school improvement. A criticism of this study is that pupil performance (using attainment data) was the measure for school improvement despite many of the implications of the study to be around relationships and building capacity for collaborative leadership.

The view that leaders can be the catalysts for the school improvement strategy, is shared by Hollingsworth *et al.* (2017) who identify the value of trust and the importance of communication (already discussed) between leaders and teachers. This creates a positive culture, where teachers can develop professionally.

3.8.2 Teacher emotions

Karami-Akkary, Mahfouz, and Mansour, (2018) focus on the emotions of teachers and the impact of this on promoting improvement. They used interviews and focus groups and found that where teachers could collaborate, and the school principal was able to encourage positive emotions, change was possible. Support from the principal also created positive emotions for the teachers and therefore there was a sustained commitment to change. Therefore, where positive emotions were developed, there was greater commitment to change. An important aspect of this work is that Karami-Akkary *et al.* (2018) identify how change does not always create negative emotions but can create positive emotions in colleagues. However, Okilwa and Barnett (2016) recognised alternative factors impacting on school improvement. They concluded their longitudinal study with the identification of four factors for sustained improvement. These were high expectations, distributed leadership, collective responsibility, and data-based decision making.

3.8.3 Community collaboration

Atkinson (2000) wrote a paper sharing his own experiences of improving a school in Hammersmith, which had been the first school to be given the Ofsted rating of being a special measures school. He recognised the importance in having consistency, his team needing to work above expectations, community collaboration and agreement. He describes how ensuring parents, teachers and pupils were all informed and working together on the improvement, brought about rapid change. Similarly, Lorion (2011) identifies how the community is

important. Lorion (2011) collaborated with the local community and health services and ensured that parents felt valued by the school. By creating a shared culture and community involvement, Lorion (2011) stated that school improvement could occur.

3.9 What can hinder school improvement and change?

Despite all the research into school improvement, some of the literature argues that school improvement is not sustainable. Sleegers *et al.* (2014) concluded that the schools they researched did not increase their capacity for change over the four-year study. Josic, Dzinovic and Cirovic (2014) have also criticised the literature, as they argue the research has not dealt with teachers' perception of factors which may impede school development. In their study in Serbia, teachers considered school improvement to be obstructed by, behaviour, motivation, and aspiration. The teachers in their study identified these as external problems that related to the home lives of the children and their families. The teachers did not see themselves as agents of change or able to impact on these factors. The authors of the study recognise the limitations of this small-scale study; however, it demonstrates the importance of recognising the teacher views on school improvement.

3.10 Chapter three conclusion

Chapter 3 offers a description of Complexity Theory using the key characteristics that I used in my study. It offers examples of these characteristics within a school context. There are, however, limitations of Complexity Theory as a lens through which to research school improvement and considering these limitations as part of the research design and process was vital.

Complexity characteristics are most prominent and evident in health and educational literature. In demonstrating how Complexity has supported the research and description within the health and education sectors gives other examples as to how this is a useful approach. This approach has been important in the process of illuminating important social structures within schools. In discussing how Complexity Theory can be identified within the current literature I have demonstrated how the theory can offer different ways of categorising school improvement.

However, I would suggest that Complexity Theory may not be able to be used to describe every part of school improvement. This was overcome in my study by using Complexity Theory to develop the initial coding but following this with open coding to ensure that teacher perceptions were accurately categorised. The methodological approach is discussed in more detail in chapter 4.

Chapter Four - Methodology

4.1 Introduction

In its approach my interpretive study is iterative (where the content for discussion is developed during the research). An explanation of how my study aligns with the interpretive paradigm and iterative epistemology is suggested at the beginning of this chapter. In chapter 1, the study's objectives identified the intention to use Complexity Theory in the methodology, and in chapter 3, the discussion demonstrated how Complexity has been used in previous research. Chapter 4 will now describe why this is important, by considering the reductional response currently typical in school improvement strategy and research. This chapter will offer a possible, improved alternative: an approach that aligns with Complexity Theory. This will be achieved by considering, from a theoretical perspective, why the characteristics of Complexity are suited for use in an interpretive, iterative study of school improvement. As part of this discussion, the use of Complexity and its limitations within the research instrument design and sequencing will be explored, as will its use and limitations as an analytical tool.

The iterative approach taken in my study aligns itself with the approach used in Constructivist Grounded Theory. A discussion on the similarities and significant differences between this methodological approach and the one used in my study is then offered, with the limitations of these discussed. The chapter will then consider the researcher's impact on the data when using Complexity Theory and an approach aligned with Constructivist Grounded Theory.

To conclude, the ethical considerations and validity of the data are illustrated.

4.2 The Interpretive paradigm

Interpretivism is linked to the writings of Weber (1949), who explained how interpretivists gain understanding through interpretation of social action, enabling them to offer a cause or explain events. Scott (2016) states, that interpretivists are concerned with the meanings that subjects make for themselves: how subjects interpret their view of reality. Cresswell (2007) suggests that these realities are multiple and subjective, and it is the role of the researcher to interpret these meanings. Cresswell (2007) explains how theory development occurs once the

researcher understands the subjects' realities. Cohen, Mannion and Morrison (2018) explain how interpretivists reject the idea that researchers can be objective and instead recognise, that the subjective view of what is real (to the those being observed) is important. Cohen *et al.* (2018) note that this does not mean that the research cannot be tested in the same way objective data can be. Cohen *et al.* (2018) also state that the interpretivist paradigm is interested in the individual and it is the role of the observer to understand and 'get inside the person and understand from within' (Cohen *et al.* 2018, p. 19). In studying the perception of teachers about school improvement, I have interpreted their view of reality, developed a theory once I have understood their perceptions, much in the way that these writers describe. This is an important direction for the research to take as suggested within the concluding thoughts of Muijs *et al.* (2004) who recommend that future qualitative research into school improvement could highlight important meaning in field.

Cohen *et al.* (2018) describe the 'paradigm of Complexity Theory' (Cohen *et al.*, 2018, p. 27) as aligning with the interpretivist approach. They believe that Complexity Theory recommends the use of interactionist and qualitative methods of research, typical in the interpretivist paradigm. I have used these methods in this research and obtained qualitative data as Cohen *et al.* (2018) have described.

Scott (2016) states that within interpretivism are four approaches that researchers use in the process of theory development. Of the four approaches suggested, the approach that I used was induction, most closely aligned with Grounded Theory. Grounded theorists allow the theory to emerge from the data, rather than forming a hypothesis and deducing a theory from testing it. I achieved this by making decisions about data collection through constant analysis of my data (in much the same way as a Constructivist Grounded theorist). A theory then emerged from the data, as Scott (2016) describes.

4.2.1 Application of the interpretive principles and an iterative approach

In accordance with the Interpretivist paradigm, I used a qualitative approach to collecting my data and analysing it. I used semi-structured interviews with teachers, followed by a focus group discussion. I carried out semi-structured interviews with the same group of six teachers, focusing on different characteristics of Complexity

Theory for each interview. The analysis of this data informed the focus group conversation that followed. Davies (2007) suggests that it is important when researching, to explore in detail, and this approach enabled me to. I was able to explore in depth because after every interview and prior to the focus group data collection, the data was analysed and coded using Complexity characteristics (and then coded using open coding). This informed the decision about which interview questions (related to a Complexity characteristic) would be used next for discussion. This can be described as using an iterative approach. Kvale (2007) proposes that it is vital that the interviewees remain fixed on what they see as important within the subject of focus. I believe that using this approach enabled this and demonstrated to the teachers that I was using 'active listening' (Kvale and Brinkmann, 2009, p. 138) by responding to the information they had previously shared. This was because I used their previous interview to determine the line of enquiry (or Complexity characteristic) for their next interview. I was also able to explain, prior to the interview findings and therefore the reasons for further clarification. This enabled me to link to previous discussions, gaining more insight into an area of interest from the preceding interview. Similarly, the focus group continued the iterative process, with the focus group discussions being determined by the data analysis of the interview transcripts.

4.3 Using Complexity Theory in the research methodology as an alternative to reductional approaches

Cohen *et al.* (2018) concur that the use of Complexity Theory in the research design is conducive with taking an interpretive approach. However, the school improvement literature suggests that reductional methods are more commonly used in schools, and in studies researching school improvement. To consider how Complexity was used in the research design of this study, it is also important therefore, to consider why this approach is used over a more traditional, reductional approach to school improvement. This part of the chapter will then suggest, from a theoretical perspective, the alternative used in the different phases in this study.

The reductional approach to school improvement assumes a lateral cause and effect process; that due to a particular activity (cause) an outcome or impact (effect) occurs. This approach identifies quantifiable outcomes that should be reached

through pre-planned system changes and identified resources. It often encourages, what Western (2012) describes, as a formal and controlling approach to leadership. Bush (2011) believes that schools use this approach due to external expectations. Joullie (2016) and Suddaby (2015) determine that a reductional approach to school improvement shows that leaders are treating development in schools in a logical way. However, I would argue that school improvement does not always take a logical direction or follow the expected path.

The Government currently measure school improvement with an analysis of pupil data and the regulatory body, The Office for Standards in Education, Children's Services and Skills (Ofsted). The Ofsted framework is used to 'ensure comparability' (Education Inspection Framework, p.1) across educational establishments. A rational response to this information takes place, and data or Ofsted findings are typically published to be used as a comparison to other schools. Over time, this provides a comparison to establish whether schools are improving. These measurable outcomes, derived in a largely reductional way, are designed not only to measure, but to be a catalyst where improvement is needed. I suggest this mirrors the explanation of Eidelson (1997) who, when discussing Complex systems, notes the assumption that social systems are driven to a state of stability or 'equilibrium' (Eidelson, 1997, p. 43).

Within education, further reductional responses occur when performance is a concern. The use of multi academy trusts to raise the performance of school or the intervention of local authorities, insinuates a cause-and-effect response; the academy will sponsor the school and therefore the school will perform better. Similarly, interventions are put in place to improve performance when concerns are raised about a particular area or subject in a school. Interventions, in whatever form they take, are then measured for success, usually in a reductional way (through data or re-inspection by Ofsted). In this case, policy makers define the way schools will be measured, what 'good performance' looks like, and reduces the responses of leaders to school improvement. Eidelson (1997) explains, that there is also a presumption that a lack of stability is a result of 'social disorganisation' or 'deviancy'. The complexity around school improvement is not considered in the reductional response to performance.

School leaders are accountable for finance, pupil achievement, and the relationship between them. Leaders rely on systems that measure impact and demonstrate a linear process of action, related to outcome, to evidence effectiveness. We can therefore see a reductional approach to school improvement emerge. Leaders will develop a school development plan with recorded goals and pre-determined system changes required to reach these goals. Bush (2011) suggests that this uses a simplistic cause and effect process to predict and specify how change will occur. Measurement of impact is also pre-determined. This is for evaluation purposes; to demonstrate that an activity has directly and independently raised standards. Leviac (2003) and Leviac *et al.* (1999) determine that this is a rational design for school improvement. Similarly, subject leaders may be required to identify system changes and measurable outcomes to evidence the development and leadership of their area of responsibility.

A reductional perspective is also reported to external agencies and school stakeholders.   Leaders are accountable to stakeholders who do, and do not, have a background in education. Wood and Butt (2014) propose that needing to share information with people with such a range of educational experiences, encourages a need for simplicity and a reductional approach. School league tables are also quantifiable measures of attainment and progress, assuming an expected and similar trajectory for all pupils. The statutory publication of the *Special Educational Needs and Disability Information Report* (Special Educational Needs Code of Practice, 2015) and *Pupil Premium Strategy* (Department for Education, 2014), require a similar perspective (of identifying goals, system changes, and predicted, evidenced outcomes).

Ofsted remains an influence in school improvement strategy and direction, and this is another area in education that is governed by a reductional approach. Leviac and Glover (2003) believe there to be a 'limited opportunity for personal bias' (Leviac, 2003, p. 97) in Ofsted reports, due to the clarity of the framework they use. However, with the infinite number of variables (Morrison, 2002) involved in school improvement, the complexity of human interaction and the personal values of the members of Ofsted teams, I would argue that the focus of inspections and objectivity could be affected and therefore reductional methods of reporting may not be representative of practice.

In my observations as a school leader, schools do not work in a linear way. Often decisions are made, as Northouse and Lee (2016) suggest when describing Complexity Theory, spontaneously. This may alter the expected direction of a school improvement strategy. Colleague's professional relationships will develop, and as described by Northouse and Lee (2016) in their definition of Complexity Theory, informal groups will be created to support each other. This often creates unplanned for, supportive, professional development, for staff. My experience working in schools has shown that the complex lives of children and families, their relationships with school colleagues and their 'numerous simple interactions' (Wood and Butt, 2014, p. 678) create new outcomes that were not previously expected. Bottery (2016) considers that these complexities will often change expectations and numbers of outcomes. This human process of self-organisation, described by Scheerens (2015), Morrison (2008), and Stacey (2000), demonstrates how the reductional approach appears to not account for all aspects of the system. This may limit the opportunities for change and the potential for exemplifying good practice to recreate positive outcomes.

In contrast, Complexity Theory recognises that change is not linear but considers unexpected events (Morrison, 2002 and 2008) unpredictability (Geer-Frazier, 2014; Wood and Butt, 2014) and spontaneity (Northouse and Lee, 2016). This recognition of schools, as complex social systems, acknowledges the substantial number of variables, unexpected outcomes, and the impact of social interactions. To demonstrate how Complexity is a more suitable response to studying school improvement, a theoretical description of how it was used, will now be offered.

Complexity Theory describes social systems as being complex (rather than complicated) and non-linear (Turner and Baker, 2019; Cochran-Smith et a. 2014; Nunn, 2007; Morrison, 2008). This is also the case with school improvement, as I would argue it is a non-linear process within the education system. The perception and process of school improvement is complex, and occurs due to several interconnecting situations, that do not have linear outcomes. Similarly, my approach that is both iterative and qualitative, was non-linear and complex. Therefore, as both the concept and method do not suit a reductionist approach (Youngblood, 1997), both are better reflected through the lens of Complexity Theory.

A key feature of Complexity Theory is emergence (Cilliers, 2000; Davis and Sumara, 1997), used to describe how systems change over time. I would suggest that it is important to use the characteristic of emergence (Cilliers, 2000; Davis and Sumara, 1997) to aid the description and development, or progression, of school improvement. This is because schools employ strategies that change policies and procedures, and impact, over time.

In complex systems impacted by temporality (Nunn, 2007; Mathews, White and Long, 1999; Byrne, 1997), spontaneous (Northouse and Lee, 2016) actions support change. I determine that spontaneous changes occur in schools and will therefore impact on improvement strategies. Changes that occur spontaneously will also have impacted on how the teachers perceived their individual situations. Therefore, the Complexity characteristic spontaneity (Northouse and Lee, 2016) is suitable for use in the description of school improvement. Similarly, the characteristic of spontaneity will be present in some qualitative methods, as spontaneous questioning could be used, as Brinkmann and Kvale (2015) suggest, to clarify or gain additional information useful to the subject being studied. The theory emerged from interviews and a focus group discussion, and it was important to therefore reflect on the emergence of the data and to respond to it spontaneously.

As a result of spontaneous re-organisation (Morrison, 2002), school improvement is impacted by relationships and interactions between elements in the system, called interconnectivity (Byrne, 2005). In Complexity Theory, interactions between subjects (Orton and Weick, 1990) could be caused by self-organisation (Cochran-Smith *et al.* 2014; Kershner and McQuillan, 2006; Morrison, 2008). I suggest that data from interviews is constructed between the interaction between interviewer and interviewee, because of spontaneous questioning: a form of self-organisation. This is even more prevalent in a focus group discussion, where the importance of reflecting on how the teachers self-organise is vital. Some teachers may not feel as confident to speak in a group and similarly they may feel uncomfortable disagreeing with something that has been said. Self-organisation will therefore impact on the data, and it was important to reflect on this during the discussion and during the analysis.

Self-organisation is described by some theorists as being a destructive force within a system (discussed in chapter 3). It was important for this to be a consideration when I interacted with the data, that self-organisation can impact in either a positive or negative way. Within my analysis I identified self-organisation within the descriptions given and did not make a value judgment as to whether it resulted in positive outcomes. However, understanding the concerns of academics (that self-organisation is primarily described as a positive concept) enabled me to engage to a greater extent analytically with my data. After initial substantive codes are identified and self-organisation recognised, it was useful to consider the perceived success of this characteristic in the data.

A complex system is impacted by its initial conditions (Byrne, 2005). The decisions and interactions that occur as part of school improvement are also impacted by starting points. Similarly, the data collected, conclusions made, and theories developed through an interview process and focus group discussion, are effected by initial conditions. The starting point, or initial findings, from the interview phases (phases 1 to 5) were important to share with the teachers in the focus group, prior to the discussion.   It was also vital to consider these starting points during the data analysis of these discussions. The starting points at this point in the research process directed the emerging data and supported the development of the theory, as recommended by Constructivist Grounded theorist, Charmaz (2006).

In Complexity Theory, change is irreversible (Morrison, 2002; Byrne, 2002; Mathews *et al.*, 1999). Teachers cannot un-experience school improvement, nor can an interviewer forget what they have learned from an interview, making Complexity a suitable lens through which to design the interview sequence. However, a teacher could forget or change their view on school improvement over time, so it is important to remember that the data is the perceived view of the teacher, rather than a definitive description of what happened. The use of a focus group discussion is useful when considering the irreversible change of systems, because teachers were able to challenge one another about how strategies were remembered, in a way not possible in the interview phases.

It could be argued that the activities and interactions that occur during the process of school improvement, have outcomes that are greater than the sum of their

interacting parts (Turner and Baker, 2019; Schreens, 2015; Cilliers, 2000; Davis and Samara, 1997), a key characteristic of Complexity Theory. It could also be argued that the outcomes could be less than the sum of the whole. Therefore, school improvement is a construct that is suited to being described using features of a Complex system. The emergence of a theory will also potentially be greater than the sum of the data obtained from the interviews and focus group discussions, therefore using Complexity Theory to support the interview sequence development and content of the focus group conversation, is a suitable response.

A limitation of using Complexity Theory in the research process is offered by Alhadeff-Jones (2008) who states that using a theory that supplies a collection of symbolic characteristics in its definition, creates ambiguity. While clarity over the definition and how I have used the theory was paramount, I also used interpretation (stated as a limitation) as an advantage. In suggesting how the characteristics can be identified in the data, this study offers a new insight into school improvement. Interpretation of the characteristics, by relating them to situations in schools, provides new understanding. Clarity about how I interpreted the data and how I made links between the data and the concepts associated with Complexity, are vital and described in the findings in chapter 6.

Complexity Theory rejects a reductional lens, however, this study was, to some extent, reductional in its approach. In predetermining the interview questions, I limited or reduced the number of possible alternatives for data collection. This is significantly different to the approach taken by Grounded theorists who open the discussion without any preconceived ideas about the data that they will find. Charmaz (2006) developed Constructivist Grounded Theory with this in mind, believing that researchers always begin research with some knowledge, and acknowledging that in education there is often a requirement for students to have completed the reading of literature on a subject before beginning a research project. Cilliers (2005) also responds to this limitation by suggesting that boundaries can offer opportunities for new knowledge to be formed. I propose that using the theory as a structure with which to formulate questions and develop the research process, was useful in ensuring all Complexity characteristics were exposed. This gave the optimal opportunity to understand school improvement. Cilliers (2002) supports this idea and states that boundaries are themselves important to define, as they form the

complex system that is being discussed. Alhadeff-Jones (2008) offers a possible alternative: opening the definition to include an unlimited list of characteristics. If this method had been used in my research, I suggest that I would have lost the focus on the key characteristics of the system (as characterised by Complexity Theory) and therefore the benefits of using a theory that describes and explains social systems with clarity, would have been lost.

Morrison (2010) describes the difficulties associated with the definition of Complexity Theory, as there is a need to define the characteristics and therefore set boundaries on the theory. He describes this as taking a reductional response (which is rejected by Complexity). I defined the characteristics from the theory prior to beginning the research and designed sets of questions based on the characteristics. How these question sets were developed is described in 5.5. However, I believe that for the purposes of reliability it was important to provide a clear explanation of the characteristics I used and a clear definition of how I used the theory. A clear definition (or description offered earlier in chapter 3) addresses concerns of specificity, however, using the characteristics to initially code also supported the systematic response to the data in the initial stages (this is explained further in 5.10). Offering initial patterns or concepts through which to begin analysis, as suggested by Layder (2005), Complexity Theory directed my thinking rather than forcing data into 'alien categories' (Layder, 2005, p. 111). This prevented narrowing the issues to a simple list of Complexity characteristics, a risk Alhadeff-Jones (2008) recognised.

The response of using open coding (after the use of Complexity characteristics in the initial coding stages) enabled me to overcome another limitation of the theory suggested by Morrison (2010). He describes how Complexity Theory is unable to recognise the emotional and human responses of those participating in the research. Identifying and coding the relationship between Complexity characteristics and then the emotional responses of teachers, was therefore an important stage in the analysis. Therefore, using this criticism to develop the analytical process, by identifying the features Morrison (2008) note are absent in the theory, enhanced my analysis further. Meagher and Wilson (2002) also consider this as a way of overcoming a limitation of Complexity Theory. They argue that using the abstract concepts initially (Complexity characteristics) and referring to the more practical (in

this case emotional responses, values, and experiences) later in the analysis, can be a way of using the theory to build new knowledge.

4.4 The theoretical approach to using Complexity theory in the research instrument design

Much of the literature on using Complexity Theory in the methodology and research instrument design is drawn from the health sector (rather than education). This chapter will now consider how these approaches (more common in the health sectors) have impacted on my response to my methodology and research instrument design. There is an explanation of how each phase in this study of school improvement was designed (from a theoretical perspective) using the characteristics of Complexity.

4.4.1 Using Complexity Theory in the methodology and research instrument design – the literature

Brainard and Hunter (2016) conclude that they were unable to establish a positive outcome between Complexity Theory and the design of health initiatives. However, I would argue that this was due to the pre-requisites they set within their sampling methods. Brainard and Hunter (2016) only considered the success of initiatives that specified the researcher's initial intentions to use Complexity Theory in the method design. This resulted in the study not including additional successful interventions that demonstrated features of the theory. I would suggest that this ignored many health strategies that may have been influenced by Complexity in the methodology design. Brainard and Hunter (2016) did recognise however, that the use of Complexity Theory at the design stage enabled a good understanding to be gained of the lived experience and the cause and effect of actions. It was important therefore to acknowledge my intention to use Complexity Theory in my methodological thinking within the objectives of this study.

Thompson, Fazio, Kustra, Patrick and Stanley (2016) also recognised (in their review of research that used Complexity Theory to underpin research design) the absence of an agreed approach to using Complexity Theory. Therefore, they also found it difficult to compare successes. This explains the importance I have placed on providing an introduction and description of Complexity and how the theory has

influenced and guided the research at each stage. Thompson *et al.* (2016) did however conclude that the use of the theory was supportive within health research, particularly as an analytical tool to organise ideas. They stated that it was used successfully to describe and explore phenomena. In chapter 5, I provide an explanation of how the Complexity characteristics (previously defined in chapter 3) were used as an analytical tool. My study also uses Complexity to support the description of teacher perception of school improvement in the discussion of the findings in chapter 7.

Gear, Eppel and Goziol-Mclain (2018) offer an alternative view. They suggest that there are researchers in health who have demonstrated how Complexity Theory can be useful in capturing situations not possible with the use of other methods. Gear *et al.* (2018) define how they used Complexity Theory in their research design into 'intimate partner violence' (Gear *et al.*, 2018, pp. 1) through a description of their methods with relation to Complexity. They addressed the Complexity characteristic of temporality by studying documentary evidence and how it impacted on health professional's responses to patients. They also describe how they used unstandardised interview questions to be sympathetic to the complexity of professional's responses. Complexity Theory was noted therefore, to support the understanding of change over time and in understanding the forces that cause change. They describe how they used 'complexity-led interviews' (Gear *et al.*, 2018. p. 6) by holding a 'vision of the phenomenon being explored' (*Gear et al.,* 2018, pp.6) and using 'improvising probes' (*Gear et al.,* 2018, p.6). They also recognised the potential impact of the interviewer's interactions in changing their participant's future behaviours. While this study suggests ways that Gear *et al.* (2018) took a Complexity-led approach, I am offering an alternative. Instead of keeping the characteristics in mind, I developed questions prior to the interviews that directed thinking to each characteristic. I also used spontaneous probing during the interviews, in a similar way to that described by Gear *et al.* (2018). I propose therefore that I have addressed the limitations found in the conclusions made by Brainard *et al.* (2016) and Thompson *et al.* (2016), by ensuring I clarified my intentions, and describing how I implemented Complexity Theory in my interview structure and question design.

Byrne (2005) recommends, that to recognise and understand change, in this case the change in a school system, Complexity Theory can be used. Davis, Sumara and Luce-Kapler (2007) suggest an alternative view. They recognise Complexity not as a theory but as a way of thinking about phenomena. I have used Complexity to understand the phenomena of school improvement by designing the interview questions and phases with the theory of Complexity at the forefront. I have therefore taken some of the characteristics of Complexity Theory and used them to design the interviews to focus the way that I think about school improvement. This supported my understanding and description of the parts of the complex system, as well as supporting the understanding of how changes emerge. Teacher's perceptions of change therefore emerged, and the theory supported the categorisation, description, explanation, and theorising about school improvement. This can be explained by considering the research phases and their relationship to Complexity.

4.4.2 The Research phases:

Prior to the data collection, groups of Complexity characteristics were developed, based on whether the characteristics were closely linked (how these characteristics were grouped is discussed in detail in 5.5). For each group, a set of questions, designed to interrogate the characteristics were predetermined. There were 5 phases of interviews and at each phase the predetermined set of questions were asked depending on the data analysis from the previous phase. This meant that after each phase the data was coded for Complexity characteristics and decisions were made as to the most suitable group of characteristics to use in the following phase. The decisions were made by considering which characteristic seemed to be most of benefit to the emerging theory. In phase 1, all 6 teachers began answering the questions from the question set called, agents and interdependencies. Phase 6, the final phase of the data collection, was a focus group discussion. The content of the focus group discussion was decided upon based on the findings described further in chapter 6).

Cilliers (2000) describes members of a system as elements, and Hetherington (2013) describes them as agents. Hetherington (2013) also names how the agents connect as connecting through interdependencies. I used the terms agents and interdependencies in phase 1, as they humanised this part of the theory. It is these

relationships between the agents, that Matthews, White and Long (1999) describe as needing to be understood, to understand complex systems. I therefore used the first phase of the interview sequence to establish who the agents and interdependencies are, within the system of Improvement.

How the change occurs will differ between agents due to, what Byrne (2005) describes as differing starting points. Cilliers (2000) supports this view by describing how elements in the system have a memory. For this reason, it was important in phase 1, to encourage a description of the agent's memory regarding school improvement. This involved gaining an understanding of an individual's culture and values surrounding school improvement, and their position of power within the system. Hetherington (2013) explains how it is important to establish the historical ideology surrounding the area of interest and the perception of how powerful agents feel, about supporting change. Hetherington (2013) argues that this might require a focus on governance and rules and therefore asking questions about who has control. This was a focus in phase 1 and in the first set of questions: agents and interdependencies.

In phases 2 to 5, teachers were asked questions from a range of question sets. Each set were written with a characteristic leading the questioning. Each interview was determined by the characteristic of most importance to the theory from the analysis of the previous phase of questions. However, in phase 6, the final phase of the study, a focus group discussion was used to clarify findings and discuss any characteristics omitted from the interview phases (in phases 1 to 5). This approach suited both the iterative approach, qualitative methods (used as part of the interpretive principles the study was aligned with) and the emergence characteristic identified in Complexity Theory.

Schreens (2015) and Morrison (2002) recognise how agents in a system self-organise and create informal groups that support system change. Stacey, Griffin, and Shaw (2000) support this, stating that it is through this self-organisation that systems can develop and change. With the focus on agent identification in the first phase, I could then ask, in later phases, questions that helped me to understand how the agents have self-organised and loosely coupled (Weick, 1976). Through the emergence of the theory there was then a focus on relationships within the system,

recognising that it is these individuals or agents who bring about the improvement or change, through their actions and relationships with each other.

Morrison (2002) states that 'emergence is the partner of self-organisation' (Morrison, 2002, p. 22). In a Complex system, changes emerge (Cilliers, 2000; Davis and Sumara, 1997) because of self-organisation (Cochran-Smith *et al.,* 2014; Kershner and McQuillan, 2006; Morrison, 2008), spontaneity (Northouse and Lee, 2016) and feedback loops (Weick, 1976). I considered throughout this study, how these characteristics support the description of school improvement and how characteristics were reflected in the methods used to collect the data. As the data emerged, the teachers were directed to the next set of questions. At times, this meant that teachers were taken back to a set of questions they had previously answered questions from. This supported gaining further insight into a previously discussed or new school improvement strategy. This reflects the characteristic of feedback loops, as the teachers were able to revisit question sets.

In asking questions about how agents adapt (Davis and Sumara, 1997) to change through spontaneity and self-organisation, I was also able to identify whether the feedback loops (described by teachers in the school improvement journey) are direct or indirect (Cilliers, 2000). Through this description of emergence of change, I was able to begin to understand additional characteristics of Complexity Theory, such as, non-linear outcomes (Morrison, 2002). Turner and Baker (2019), Cochran-Smith *et al.* (2014), Nunn (2007) and Morrison (2008) support the view that interactions are non-linear. Using feedback loops within the interview method ensured clarity of understanding about the information gained about the agent's relationships from phase one.

Using a process of feedback loops within the method (going back and potentially using question sets with teachers that they have already been questioned on) supported the understanding of the interconnectedness of teachers from phase 1 and aided the identification of patterns in the data. Beekun and Glick (2001) state how the characteristic of loose coupling can also be useful in noticing patterns, particularly in 'structural relationships' (Beekun and Glick, 2001, p. 227). Alternatively, Cilliers (1998) suggests that through studying the interaction between the elements (agents) researchers can see what influences their view of reality. I

used questions that considered this impact of relationships on how teachers perceive school improvement, and how patterns in relationships develop over time, another key characteristic of Complexity Theory.

Complexity Theory recognises the importance of temporality (Nunn, 2007; Mathews *et al.* 1999; Byrne, 1997) and as school improvement takes place over time, this was an important characteristic to focus on in phases 2 - 5. I asked questions that highlighted how change occurred over time and how important the concept of time was in teachers' perception of school improvement. I endeavoured to find out how the relationships or connectivity (Byrne, 2005) between the agents identified in phase 1, changed over time, alongside the changes in the school.

The descriptions of school improvement from phase 2 to 5, highlighted when the teachers' schools (the complex systems) had their state of equilibrium challenged. Kersher and McQullan (2016) and Smith (2013) argue that this is when change in a Complex system occurs. I was then able, as the data emerged, to ask questions about why, and then how, this change happened. Through my questioning I confirmed the system's state of equilibrium (Kersher and McQullan, 2016) and how school improvement was perceived to occur after equilibrium was challenged. I therefore questioned teachers about unpredictable outcomes and challenges that were faced within the school improvement process. Complexity theorists, such as Schreens (2015) and Turner and Baker (2019), explain how complex systems demonstrate unpredictability (Geer-Frazier, 2014) because what emerges is more than the sum of its parts. As the theory emerged, through phases 2 – 5, I was able to ask questions that established whether this was the case.

The success of school improvement could be seen as the ability to make sustainable improvements through a change process. Gear *et al.* (2018) consider how, when agents interact and self-organise over time, discourses change, as do what we perceive to be real. Phase 2 to 5 also contributed to the understanding of how new patterns of behaviour become the norm. Questioning identified these changes and whether any patterns were prevalent in the descriptions. Question sets established whether teachers perceive the changes as sustainable and how this sustainability relates to interactions between the agents identified in phase 1. Later questioning

also sought to establish whether teachers perceived the outcomes to be greater than the sum of the changes implemented at the point the equilibrium was challenged.

Complexity Theory also identifies the unpredictability (Stacey, Griffin, and Shaw, 2000) of Complex systems, and after analysis of the transcripts, I identified situations where this was prevalent. I used the question sets in phase 2 - 5 to further clarify and investigate situations of unpredictability, to further understand how teachers perceive school improvement.

4.4.3 Limitations of using Complexity Theory in the research methodology

It could be considered that a possible limitation of using Complexity Theory in research design is the concept of Complexity reduction. This is where a complex social system is reduced due to the creation of artificial boundaries (Hetherington, 2013). In my study, it could be argued, that this occurred through the creation of artificial boundaries in the sampling, creating preconceived questions for interviews, boundaries within the timings of the interviews themselves, and the boundaries created through studying part of a system (rather than the whole). Biesta (2010) would argue that the participant sampling prevalent in the research process reduces the number of options for elements to interact. However, I overcame some of this by using a focus group discussion in phase 6 of the research. I would suggest that this gave teachers time to discuss their perceptions, consider other people's perceptions and respond to them.

Biesta (2010) offers the view that the constraints placed on language, through the interview process, also creates a reduction in Complexity. This would lead us to the conclusion that Complexity reduction prevents the researcher seeing the whole picture. However, Fenwick (2010) suggests an alternative view, stating, that if we see the whole as being more than the sum of its parts, 'the less-than-whole cannot simply be assumed to be the reduction or suppression of these parts' (Fenwick, 2010, p. 58). Another alternative viewpoint is given by McDaniel (2001), who states that trying to make sense of a system requires interactions, and these interactions themselves will create 'new uncertainties and ambiguities' (McDaniel, 2001, p. 25). This supports Hetherington's view (2013), that rather than working in opposition, emergence and complexity reduction are working 'at the same time' (Hetherington,

2013, p. 74). I offer an alternative view, that by interacting with the elements of the system, the researcher is part of the system, supporting emergence (in this case of data), rather than reducing it. However, I needed to be aware of the boundaries I created within the research process, and remain flexible, to respond in a way that is sympathetic to the Complexity perspective.

Jordan *et al.* (2010) suggest, that making the use of a theory within research design is challenging for a Complexity researcher because it does not allow for the Complexity of the system to be fully studied. However, Kincheloe (2007) states that all researchers are boundary makers and therefore all researchers will impact on their data. I would suggest that in a complex system, Complexity will prevail and flourish because of, and despite, the interactions between the interviewer and interviewee. Therefore, boundary makers will be unable to limit the outcomes using the theory in the method design. If systems are viewed from a Complexity perspective, then the boundaries set will not limit the infinite range of interactions (Hetherington, 2013) to be studied. In fact, Cilliers (1998) argues, that reducing a system to smaller parts, does not, from a Complexity perspective, make it any simpler.

It could be argued, that as a theory originating from mathematics and computer science, Complexity does not allow for the emotional responses, moral issues, and values of individuals to be studied. However, I used Complexity characteristics only in the initial stage of data analysis and used open coding at the secondary stages. This enabled me to move away from the restraints of using only the characteristics recognised by Complexity (void of the opportunity to consider moral issues and concerns) and be responsive to the emotional responses, the teacher's values, and moral standpoints. This analytical process enabled me to consider, as Morrison (2010) describes, the emotional and human responses, as the theory emerged. Identifying and coding the relationship between Complexity characteristics and the emotional responses was an important stage in the analysis. Therefore, using this criticism to develop the analytical process, by identifying the features Morrison (2008) note are absent in the theory, enhanced my analysis further. Meagher and Wilson (2002) also consider this as a way of overcoming a limitation of Complexity Theory. They argue that using the abstract concepts initially and referring to the

more practical (in this case emotional responses, values, and experiences) later in the analysis, can be a way of using the theory to build new knowledge.

4.4.4 Summary of thoughts about using Complexity Theory characteristics in the research instrument design

The objectives of this study were to approach the study through a lens of Complexity. It was important therefore, throughout the implementation of my study, to consider how Complexity Theory could enhance my research methodology, while being aware of the limitations of this approach. As part of this approach, I needed to consider what Hetherington (2013) states, that the interviewer should be sympathetic to the view of emergence of unpredictable data. It was also important to consider the characteristics of temporality and irreversibility and understand that there will not be an end to the data and finality to the conclusions. Additionally, I also needed to be sensitive to the non-linearity of the research process. It was vital to retain clarity on how I used Complexity Theory in my methodology design, and how this impacted on my data.

4.5 Complexity Theory as an analytical approach to research school improvement

Davis (2015) describes how schools, teachers, and therefore school improvement, can experience volatility and uncertainty, as well as stability and linearity. It could be argued that this is because school stakeholders (such as teachers, children, and parents), schools and school improvement are all dependent on external environments and relationships with other people. I would suggest that this makes the analysis of data (that provides an understanding and comparison of these concepts) impossible within a reductional lens. Reductionism, where a complex phenomenon (such as school improvement) is reduced to being described by its simple components, cannot describe the complexity and diversity of the processes required for analysis of data that explores school improvement. Complexity Theory, however, describes systems as unstable and non-linear and as Byrne (2005) acknowledges, recognises the importance of the connectivity between elements in the system.

Analysis of data that explores school improvement requires a description of connectivity made possible through the comparison with the characteristics associated with Complexity Theory. In isolation, the connectivity between, for example, experiences of one teacher and school improvement, are not sufficient in understanding the impact and outcomes. This is because the initial conditions or experiences of one teacher may result in differing outcomes for different people, depending on other external and internal experiences. Therefore, a reductional explanation of cause and effect is not suitable. Kershner and McQuillan (2016) describe interacting elements present in a system and Nunn (2007) describes these connections as networks in a system. To understand how these elements and networks work together in school improvement requires an understanding within the data analysis that recognises outcomes as being greater than that parts that contributed to it. This contrasts with an approach where outcomes are 'reducible to the sum of their parts' (Byrne, 2002, p. 19). The complex social systems described therefore required a theory that supports an analysis, where it is understood that 'causation is complex' (Byrne, 2002, p. 19).

Mathews *et al.* (1999) describe the importance of time on systems and how temporality is recognised in Complexity Theory. This theory also recognises the non-reversible, and as Byrne (2002) and Mathews *et al.* (1999) describe the historical impact on systems. This mirrors how teachers experience school improvement and how schools change over time. Turner and Baker (2019) state that there can be no reversal within a Complex system, much like in in a school, where staff and areas of focus alter and there are new catalysts for change. The significance of the temporal nature of these systems is not only acknowledged, but required, to explain a key feature of Complexity Theory: emergence. In describing school improvement in relation to teacher's lived experience, teachers demonstrated the emergence of key outcomes that are impacting on the school. Complexity Theory provided a language through which to understand emergence within the data. This enabled the direction of future research collection to be confirmed and further analysis to take place.

Mathews *et al.* (1999) describe how human behaviour is not linear and I would suggest neither are the lives of teachers (in and out of school), schools themselves and therefore school improvement. I believe that behaviour is influenced by an

individual's external environments and by the individual's internal responses to these, features that Mathews, White and Long (1999) identify as consistent with the theory of Complexity. Complexity Theory also accepts 'non-average behaviour' (Morrison, 2002, p. 7) where individuals who have similar experiences or situations may as Morrison (2002) states, have differing outcomes. At an analytical level this ensured a reflexive approach, considering individual reactions, reflecting personalities and individualism. Individuals also respond to other people (discussed previously as connectedness) and this 'implies relationships' (Morrison, 2002, p.19). Meagher and Wilson (2002) agree that Complexity Theory acknowledges these relationships and the experiences of individuals in social problems.

Byrne (2005) describes how teachers do not live in isolation from their immediate social environment, therefore, trying to separate the teachers from the connections they have with their environments and colleagues, was not a suitable analytical response. This interaction in school (and possibly outside of it) had several different outcomes, emerging as Levy (1992) describes, as more than the sum of its parts. Therefore, engaging with what Youngblood (1997) and Morrison (2002) describe as a holistic theory, that recognises how parts of the system interact with each other, was appropriate at an analytical level.

4.5.1 Complexity theory aiding description: the rejection of a reductional lens

A reductional approach assumes a lateral cause and effect process: that due to a particular activity (cause) an outcome or impact (effect) occurs. A linear approach to explaining effects offers predictability and the opportunity for generalisations. However, the behaviour of humans, their relationship to each other and their environments, cannot be simplified in a reductional way or predicted using what Morrison (2008) describes as a cause-and-effect method. To gain a true description of school improvement, Smith (2013) argues, that there is a requirement to describe all the agents influencing the system. Therefore, to understand the perceptions of teachers (agents) in phase 1, the lens of Complexity was useful on an analytical level. In comparison, a reductional explanation of the behaviour of individuals in a social system, Mathews *et al.* (1999) suggest, is therefore unsuitable and limiting. Alternatively, Complexity Theory describes complex systems that can be described as non-linear (Nunn, 2007) and dependent on historical information. Nunn (2007)

argues it enables an analytical response that can describe systems that cannot be predicted. Complexity Theory can therefore provide a more accurate analysis of the complexity of social phenomena, problems (Meagher and Wilson, 2002) and lived experience.

The relationships between the teachers and their colleagues, their relationship with the school they work in, and the relationship between these elements and school improvement, are complex and non-linear. Meagher and Wilson (2002) stress the importance of acknowledging the complexity of these relations, and Layder (2005) argues that Complexity Theory can therefore provide a language with which to compare these experiences and interactions. The language of Complexity can provide an explanatory description, rather than a simple observation of what parents have said. Sawyer (2007) argues that this provides an opportunity within the analytical process for comparing individual's descriptions and the relationship they have to events.

By using Complexity Theory in my analysis, I acknowledge the self-organising systems that are in a state 'far from equilibrium' (Eidelson, 1997, p. 43) and was able to ask questions that are not constricted by these assumptions. A rejection of a reductional lens and linear explanations therefore supported analytically, by ensuring an accurate description of teacher experiences.

4.5.2 Complexity characteristics and how they supported the analysis of the data

4.5.2.1 Recognising the nature of meanings: spontaneity, self-organisation, and loose coupling

Changes within a social system can, but do not always, happen slowly over time and incrementally. Three of the key features of non-linear systems that describe this change are described by Nunn (2007) as spontaneity, self-organisation, and loose coupling. Byrne's (2002) description of how change can be sudden and unexpected, describes the spontaneity characteristic, found in Complexity Theory. As a result of disorder, described by Alhadeff -Jones (2008) and Stacey (2000), change occurs, and systems will evolve spontaneously. Order in the system is therefore not imposed, but as Morrison (2008) describes, self-organised. Change also occurs in the form of self-organisation. Self-organisation is a response to the environment

where individual components support each other and create new networks (Morrison, 2008). One way that this can be described is through 'loose coupling' (Weick, 1976). Loose coupling describes how subjects in systems interact with each other (Orton and Weick, 1990) and the level of dependence they have on each other (Beekun and Glick, 2001). Loose coupling occurs when subjects within a system work together to increase the number of, and strength of, connections between them.

A description of spontaneity, self-organisation and loose coupling supported the observations made in the data analysis and aided in the scrutiny of explaining how events occurred. It also highlighted what Matthews *et al.* (1999) describe, as the external and internal environments that explained how school improvement occurred. These characteristics gave an understanding of the nature of the meanings of the teachers, improving the analytical process. Using these characteristics to explain how outcomes occurred, structured provisional findings, and as Layder (2005) suggests, provided opportunities for me to classify findings. I propose this was useful in making sense of the human experience of school improvement and explaining the relationships between the different concepts highlighted earlier. These characteristics therefore provided a way of categorising and beginning to understand the organisation of the system, which Layder (2005) identifies, as a strength of using Complexity Theory. Viewing systems and individuals as connected to their environments, is a view supported by Kershner and McQullan (2016). They emphasise how not separating a school from its relationships with other stakeholders is important. I suggest this is like understanding how schools self-organise, potentially through loose coupling, by being connected to their internal and external environments.

4.5.2.2 Emergence: Understanding the how

In addition to using Complexity Theory to describe and understand the meaning of data, I argue that it is possible to contribute to the analysis of how outcomes occur using the Complexity Theory characteristic, emergence. Through self-organisation and change, Smith (2013) suggests, new systems emerge. Byrne (2002) recommends that within social science the word 'appear' is a better way to describe this characteristic, as it indicates a less gradual change. However, to be responsive

to the data, identified as important by Charmaz (2006), I considered emergence as a theme that may occur over varying time periods. To ensure I accurately categorised the teacher response to school improvement, I needed to use this characteristic. This ensured that, as Layder (2005) recommends, direction rather than limitations were given to the findings. I therefore used the theory to provide a stimulus with which to respond analytically to.

Geer-Frazier (2014) states that most environments humans are exposed to are unpredictable. Therefore, understanding how improvement has occurred through the characteristic of emergence was useful in the analysis. Similarly, it is likely that teachers will have made decisions or 'willed alternatives' (Byrne, 2005, p. 5) that alter outcomes, and it is important to understand the emergence of these. As I found little research describing the emergence of school improvement, the language of Complexity Theory was used for clarification purposes in the analysis.

Identifying emergence within the data enabled the analysis to draw together the other Complexity characteristics and explain their affects. The analysis moved from one of description, to one of describing how events occurred. For example, an emergent outcome may occur due to a description of self-organisation as well as or instead of a spontaneous occurrence. Cochran-Smith *et al*. (2014) stated that emergence is described as occurring dynamically. Davis and Sumara (2006) and Morrison (2008) support this view, suggesting that emergence is the result of learning from historical events. I put forward that school improvement can happen both dynamically and is impacted on from historical events, making this theory supportive in the analysis of the school improvement data.

4.5.2.3 Moving between teacher's reality and the abstract: reflexivity, equilibrium, feedback, and systems faced with uncertainty

Complexity Theory recognises a state of uncertainty in systems, and White and Levin (2016) argue, that this condition is required for successful systems to survive. Mathews *et al*. (1999) state that social systems today are left in a position of uncertainty and increasing state of change. I argue that the individuals associated with the concept of school improvement are also all at risk of uncertainty and unpredictability. In recognising uncertainty in systems, Complexity Theory was therefore helpful in analysing the lived experience of teachers and the subject of

school improvement. Using the unpredictability characteristic in my data analysis, enabled me to explain the experiences of the participants, using an abstract concept. I was then able to move between the abstract and the lived experience of teachers, aiding the analysis of the data and enabling me to make comparisons between individual's accounts.

Instability and uncertainty cannot occur in a state of equilibrium. Equilibrium is a condition that, according to White and Levin (2016) needs to be disrupted for change to occur. Due to the nature of how we identify and categorise school improvement in education, presumptions are made about the situations of the schools; that their state needs to be changed to create equilibrium, where they are no longer poor performers. Using the abstract characteristic of 'equilibrium' in my coding, and, in contrast, the theoretical characteristic of unpredictability and uncertainty, I was able to create categories that explain the state or position teachers describe. This enabled comparisons to be made between teacher descriptions. It also provided opportunities to move between the descriptions given by the teachers and the speculative concepts, enabling me to make further comparisons and observe patterns in the coding. Guzman-Valenzuela (2016) describes this as moving between the 'etic and emic perspectives' (Guzman-Valenzuela, 2016, p. 98) or between the theory and the empirical. She believes that working with both perspectives enables the theoretical to connect with the participant's reality, therefore, offering new interpretations and awareness.

Systems that are not in a state of equilibrium require the parts within it to self-organise and be reflexive or adaptive. Turner and Baker (2019) and White and Levin (2016) argue that this creates feedback loops between connected parts, networks or as Cilliers (2001) suggests, identifiable patterns in the system. Marion (1999) describes feedback loops as occurring when agents of a system are inter-connected. These connections occur through reflexive interactions and self-organisation between the parts of a system, as a response to instability. Identifying these theoretical characteristics within the data enabled me to analytically consider the experiences relayed. Layder (2005) also considers that this enables the researcher to describe the properties associated with the lived experience, in my study, of teachers at an abstract level.

4.5.2.4 Using Complexity Theory to explain social organisation and challenge current knowledge

Traditional responses to analysing social organisation have been criticised for over-simplifying phenomena. Mathews *et al*. (1999) indicates that these reductional limitations can be avoided using Complexity Theory. The characteristics of Complexity can support the analytical description of organisational processes and phenomenon. In my study, they were used to describe the processes and phenomenon described by teachers about school improvement. Turner and Baker (2019) suggest this will provide a holistic response to describing a social organisation problem.

Complexity Theory is used within other fields and areas of social science to explain, categorise, and offer solutions. White and Levin (2016) propose that Complexity Theory can guide reform in society as well as describe it. Therefore, using Complexity Theory to engage analytically with my data, made it possible to challenge existing knowledge, and offered opportunities to create new knowledge. Despite this, using Complexity Theory to engage analytically with the data was not without its limitations.

4.5.3 Limitations of using Complexity Theory to analyse the data

The origins of Complexity Theory are found within the physical sciences. Alhadeff-Jones (2008) and Morrison (2010) consider how, unlike in the social sciences, physical science does not engage with morals and values in its observations. In identifying another limitation, that Complexity Theory can only offer part and possibly not all the information about a system, Cilliers (2000) counteracts this concern. In recognising that Complexity Theory offers an opportunity to understand phenomena and does not seek to offer the whole explanation, and therefore make judgments about a system, I have overcome this criticism in my analysis. I have also used an approach that aligns to Grounded Theory, where the researcher becomes part of the research process. This ensures that the human response Morrison (2010) argues is absent from Complexity Theory, was addressed in the analytical process and decisions made by the researcher during the whole study.

My analytical approach also responds to this limitation by only using the theory to support my introductory coding. This enabled me to consider the emotional and human responses (Morrison, 2010) in later phases of the analysis and coding. Identifying and coding the relationship between Complexity characteristics and the emotional responses will be an important stage in the analysis. Therefore, using this criticism to develop the analytical process, by identifying the features Morrison (2008) note are absent in the theory, enhanced my analysis further. Meagher and Wilson (2002) also consider this as a way of overcoming a limitation of Complexity Theory. They argue that using the abstract concepts initially and referring to the more practical (in this case emotional responses, values, and experiences) later in the analysis, can be a way of using the theory to build new knowledge.

The difficulties associated with the definition of Complexity Theory can be overcome by providing a clear explanation of the characteristics used within my research. A clear definition (or description) will address concerns of specificity; however, as Layder (2005) suggests, using the characteristics to provisionally code supported the systematic response to the data in the initial stages. Offering initial patterns or concepts through which to begin analysis, Complexity Theory directed thinking, rather than forcing data into 'alien categories' (Layder, 2005, p. 111). This also prevented narrowing the issues to a simple list of Complexity components (Alhadeff-Jones, 2008).

4.5.4 Using Complexity Theory in the analytical process – a summary

Using a theory in my analysis allowed me to provide structure to my data (Layder, 2005). Without the theory, my transcripts might have remained, as Coase (1988) explains, 'a mass of descriptive material' (Coase, 1988, p. 230). Complexity Theory provided the opportunity to systematically interpret my data, but within a framework that acknowledges the collective experiences of individuals (Davis and Samara, 1997). The language of Complexity supports the understanding within the analytical process and can describe and explain the complex interactions surrounding the dilemma of school improvement, without which, the experiences of the teachers' might otherwise be difficult to compare. Complexity Theory ensured the movement from the subject's descriptions, to addressing how and why school improvement occurred.

Morrison (2010) explains that Complexity Theory challenges ways of thinking, offers new ways of looking at social organisation, and forces 'creativity' (Morrison, 2008, p. 33). Complexity Theory can provide information about problems (Meagher and Wilson, 2002) and offer new ways to explain relationships (Davis and Samara, 1997) and interactions (Turner and Baker, 2019). It also highlights my values, as the researcher (Suddaby, 2015) proposes is important, by emphasising my criticism of responding in a reductional way to the complexity of school improvement. While the theory may not provide solutions, it did begin to demonstrate why school improvement is a difficult concept to describe. It provided initial insights into the dynamics of the interactions (Kershner and McQuillan, 2016) surrounding school improvement.

4.6 The influence of Constructivist Grounded Theory on the research design

The approach to my research design was heavily influenced by Grounded Theory. Using a Grounded, iterative approach, and allowing the theory to emerge or be constructed from the data, was fundamental to the research design, methods, and analysis of my study. However, there were some significant differences, such as the differences in the thematic response to the data, and this chapter describes how the two approaches compare.

Grounded Theory, developed by Glaser and Strauss in the 1960's, takes an inductive approach, and as described by Potter (1998), has the purpose of generating theory from analysis of a social situation. This new premise demonstrated how qualitative methods could be used to develop a theory through, what Miller (1995) describes as constant comparison of coded concepts.

In 2006, Charmaz used the principles of Grounded Theory to develop Constructivist Grounded Theory. Charmaz (2006) demonstrated how, by using a flexible approach to data collection and analysis, researchers can develop a theory that has its 'own logic' (Charmaz, 2006, p. 2) through a description of participants' experiences. Charmaz (2006) recognises how the researcher brings their own experiences to the research and understands that often, the researcher will have knowledge gained from reading literature prior to developing new ideas or theories. The methodology

described in Constructivist Grounded Theory therefore closely aligns to the approach taken in my study.

Figure 11 illustrates the similarities and differences between the two approaches to research design, using a Venn diagram. These comparisons are then described in more detail.

Theoretical sampling with a thematic approach (pre-determined) to data collection

Framework provided prior to data collection

Complexity characteristics used to initially code, followed by focused coding.

| This study's research approach | Constructivist Grounded Theory |

Substantive research questions

Flexibility to adapt research methods, focus of data collection, and instruments, while collecting data, based on emerging theory

Researcher takes decisions and influences the direction of the research

Memo writing

Theoretical sampling with no thematic structures pre-determined

Initial open coding followed by focused coding

Figure 11: A comparison between the approach taken in my study of school improvement and Constructivist Grounded theory.

Constructivist Grounded Theory recognises the necessity for an initial area of focus. This provides a substantive research question, that ensures the focus of the research is meaningful and based in participant's reality. In this study the research question was developed from my experiences of school improvement and understanding of Complexity Theory. Constructivist Grounded Theory also uses a range of data collection methods that can be adapted as the data emerges and, in my study, I used semi-structured interviews and focus groups that were developed

after each phase in the research. This flexibility in research design is therefore mirrored in both my study and in Grounded Theory, enabling the researcher to be able to respond to the data and emerging theory in a similar way.

However, it is within the data collection stage of the research that the two approaches differ significantly. Constructivist Grounded Theory encourages the researcher to analyse the data and then develop the next stage or phase in data collection. This theory enables the researcher to use theoretical sampling to direct the data collection in the area that the researcher determines is of most importance to generating the theory. In contrast to Grounded Theory, where the methods and analysis are constructed as the data collection takes place, I had a structure (based on the characteristics of Complexity Theory) determined prior to the data collection. However, in a similar way to Constructivist Grounded Theory, as the data was analysed, I made choices and decided (based on what is most beneficial for the theory development) which characteristic question set would be investigated next. A key difference is also prevalent at this point in the data collection and analysis. Grounded theorists code the data using themes that are prevalent during the analysis. This supports decisions about future data collection. In my study, I used a similar response to the data (using it to inform future data collection) but my response to the thematic approach differed. My study had predetermined codes (based on Complexity Theory) that were used in the initial coding. The characteristics identified, informed the next question set or focus for data collection. I then used open coding (in a similar way to Grounded Theory) once saturation had been reached.

Therefore, theoretical sampling is present in both approaches, however, in Constructivist Grounded Theory, as the researcher does not have a choice of pre-determined directions that the data collection can take. Therefore, there is a similarity in the flexibility of both approaches, however Grounded Theory does not have a framework to work within.

Charmaz (2006) describes the methods of data collection as tools, chosen to best reflect the data collected. These tools are chosen as the theory emerges, to ensure the data is rich. Similarly, in my research I used semi-structured interviews initially, and then used focus groups to ensure the complexity of the subject being discussed

was fully explored. Focus groups were also used to ensure there was a cooperation of knowledge. This is similar in Constructivist Grounded Theory research, where methods are adapted to ensure saturation of the subject being researched.

In an interview in 2006, Puddephatt (2006) reports how Charmaz described that it is important to recognise the researcher and their influence on the research. In developing pre-determined question sets, based on Complexity Theory characteristics I have demonstrated how I have influenced the data collection. It was also important to describe the decision-making process, at each stage of the data collection, in chapter 5. This explained how it was determined which characteristic was important to investigate and in which order, at each phase. Therefore, embedding the researcher 'in the research process' (Charmaz, 2008, p.160) mirroring the approach taken by Constructivist Grounded theorists.

Charmaz (2006) advocates the use of memo writing, as this can be used to exemplify the position of the researcher. Memo writing can also support the researcher in the data analysis, by helping to create categories and determine the focus for further data collection. Memo writing was used in my study to inform the decision process when identifying the Complexity Theory characteristic each teacher would provide data on next. Memo writing was also utilised to explain the reasons for decisions, therefore providing transparency in the data collection, analysis, and theory development process. As Charmaz (2006) prescribes, the influence of the researcher on the research is exemplified and comparisons can be made, throughout the analysis.

In addition to using memos in the analytical process, Constructivist Grounded Theory uses initial open coding (where each line of data is given a code) followed by focused coding. Focused coding uses *in-vivo* codes, used by Charmaz (2006) to describe codes taken from direct quotes in the data. Focused coding organises the initially coded data further.

In contrast, my data analysis used the characteristics of Complexity Theory to determine the codes in the initial stages, and then used focused coding, including *in-vivo* codes (Charmaz, 2006), to further organise the data. The characteristics of Complexity Theory used in the initial coding, determined which characteristic was the focus for further data collection for each teacher (with the same outcome as initial

open coding of Grounded Theory). The focused coding in my methodological design had the same purpose as in Grounded Theory; to organise the data based on the participants understanding and experiences.

4.6.1 Limitations of using a non-linear approach and Grounded Theory

Although my methodology arguably aligns with the principles of Grounded Theory, there are some differences that can be best described by considering the limitations of both approaches.

In developing Constructivist Grounded Theory, Chun Tie, Birks, and Francis (2019) suggest that Charmaz (2006) developed an approach that was more flexible than previous research methodologies. It can, however, be criticised because of the influence of the researcher on the data. In response to this limitation, Charmaz advocates the clear description of the position of the researcher throughout the process and recommends that a literature review is completed after the theory is determined.

In using Complexity characteristics to pre-determine and limit the potential direction of the research there is less flexibility offered than in Grounded Theory. This restricts the unlimited options (that a Constructivist Grounded Theory researcher would have) to those pre-determined at the start of the research. The flexibility was provided, in choosing the degree to which the characteristic became a focus, the order the characteristics were focused on, whether to revisit characteristics for further analysis, and whether to include all the characteristics in the process. These decisions were determined by the teachers (through data analysis) in much the same way as the subjects would in a Constructivist Grounded Theory approach. Offering a structure to the thematic response to data collection and analysis also attempted to address some of the difficulties I had previously faced (in my master's degree research project) by providing an initial focus and theoretical structure for the research. Memo writing also exemplified the decisions taken by the researcher (as it does in Constructivist Grounded Theory) and therefore provided the transparency required to address this potential limitation.

Constructivist Grounded Theory is flexible in the initial coding stages of the data analysis, allocating codes to each line of data and using *in vivo* coding (where

quotes from the interviews are used as the coding descriptor). Comparatively, in my approach, only the characteristics of Complexity were used in the initial coding stage. It could therefore be argued that my approach is limiting, because the data is too heavily influenced by the researcher. In contrast, initial coding in Constructivist Grounded Theory provides the researcher with an unlimited number of possibilities for coding, therefore not predetermining and influencing the analysis as extensively. Alternatively, it could be argued, that providing a structure based on Complexity Theory characteristics prior to the analysis, provides the researcher an element of objectivity not seen in approaches adhering more closely to the Grounded Theory approach.

Using coding, pre-determined by the characteristics of Complexity Theory, there was an initial structure provided to direct the coding process. This could be considered a limitation as it does not allow for the complexity of the social system to be fully considered. However, in the focused coding later in the analytical process, *in-vivo* codes (Charmaz, 2006) are used, ensuring that the teachers' voices were supporting the theory development. This enabled the data to be organised according to themes that made the most 'analytical sense' (Charmaz, 2006, p. 46): a suggested strength of Grounded Theory.

Both approaches to research reflect the view that the theory should emerge from the data. Both approaches aim to provide the researcher with flexibility and opportunities to make decisions based on the data analysis. They also require the researcher to be reflexive and 'open to exploring' (Charmaz, 2006, p. 47) the data. Grounded Theory, however, encourages the researcher to have no pre-determined ideas, while my approach provides a structure for the research based on the characteristics of Complexity.

4.6.2 Concluding thoughts - The researcher impact of using Complexity Theory and an approach aligned with Constructivist Grounded Theory

The use of an iterative approach, that I align closely with Constructivist Grounded Theory, enabled the perceptions of teachers to emerge from the data. I impacted on this data by making decisions as to the direction of the research questioning and focus group discussions, based on my analysis of the data and the theory that was emerging. My previous experiences of school improvement will have impacted on

how the data was analysed, so I used a theoretical structure to direct the coding, analysis, and decisions throughout. Using Complexity Theory as the theoretical structure with which to base my questions and initial analysis of the data, will have taken the analysis in a particular direction. However, previous chapters have discussed why this appears to be a suitable response to studying school improvement based on how it can describe the system through a theoretical lens. The clarity of the definition and description of how the theory was used, within the interpretive paradigm, suggests validity.

4.7 Ethical considerations

McNamee (2002) highlights the need for 'voluntary, informed consent' (McNamee, 2002, p. 2) when completing research, and this will be at the forefront of my ethical considerations. An example of the information provided to teachers is illustrated in appendix 1 and the informed consent (signed by teachers prior to commencing the research) is given as an example in appendices 2 and 3. Many of the teachers in the study were unfamiliar with the possible purposes, audiences, and publication opportunities of a doctoral thesis. This was also highlighted by Sainsbury and Corden (2006) who identified how participants, in research that was published using quotations from their interviews, did not always understand how their comments might be presented or used in the final publication. It was therefore important to explain the possible outcomes of the research and the role the teachers played within it. It was also important to show an example of what the final thesis might look like, and this was achieved using my master's thesis that also used verbatim quotations. This enabled teachers so ask questions and be informed about how their 'data' might be used and presented. After this conversation I shared with potential participants the 'Information for participants' (illustrated in appendix 1) and the 'Informed Consent form' (appendices 2 and 3).

 Due to the sampling procedure, the ability of the potential interviewees to give consent (McNamee, 2002) was established, however the ethical dilemma of being suitably informed, was not. Therefore, I endeavoured to provide potential interviewees information on the possible implications of the research. I also provided information regarding the nature and purpose of the study (Cohen *et al.* 2007;

Homan, 2002 and 1991) and the potential benefits and contribution the study may make to the debate surrounding school improvement.

It was important that once implications of the study were discussed with the teachers, and informed consent (Briggs *et al.* 2014; Newby, 2010) was given, I provided opportunities to revisit this information. To ensure I was continuing to consider the impact of the research on the teachers and consider any negative effects (Homan, 2002), I needed to revisit the concept of consent throughout the process. Part of my responsibility as a researcher was providing opportunities for the teachers to withdraw consent, while being aware that they may feel an obligation to continue (Homan, 2002). This was part of my commitment to ensuing there were no negative impacts on the teachers in the future (Pring, 2015 and 2002). I provided opportunities within the interviews to summarise my findings, in order that teachers could respond, disagree, and negotiate the detail (Pring, 2002 and 2015). I also continued to inform teachers about what would happen at each stage of the study (Briggs *et al.* 2014), enabling teachers to make informed decisions about their participation.

Cohen *et al.* (2007) highlight three ethical issues for consideration. As well as considering informed consent (Briggs *et al.* 2014; Newby, 2010) and the impact of the interview on the interviewee, the researcher should consider confidentiality (Pring, 2015; Newby, 2010). Every opportunity was taken to ensure confidentiality. I allocated each teacher a number and coded all the interview transcripts with letters and numbers to ensure discussion within the text did not identify the teachers, where possible (this process is explained in 5.2). However, due to the small-scale nature of the study, there will always be the chance that teachers could be recognised, and as Pring (2015) states, anonymity can only occur to an extent. For example, teachers discussed their roles and the strategies related to the differing leadership responsibilities that they held. A teacher who worked in the school with them, and with the strategy they discussed, may identify a teacher from what they have said. This was explained as part of the informed consent discussion.

During the interview process I continuously considered the impact I was having on the research and teachers. Some teachers may have sensed (possibly unconsciously) a difference in power balance (McNamee, 2002) or seniority

regarding subject knowledge. As I was able to refer to the teachers' previous discussions in proceeding interviews, it was hopefully evident that what the teachers were discussing was of importance, and that it was their perceived experiences that were of interest to the research. The intention was therefore, to counteract any concerns of power balance within the interviewer and interviewee relationship.

Prior to the interviews and focus group discussion taking place, I considered the potential impact of my professional role in the education community and what impact this may have on teachers' answers. Kvale (1996) recommends using a variety of questioning techniques, such as questioning directly and indirectly, and probing for more information. I propose that this motivated the teachers and demonstrated to them that their perceptions were of interest, rather than my own experiences. Through building a rapport with the teachers, being trustworthy, and as Pring (2002) suggests, providing examples to the teachers when discussing the findings at the end and beginning of each phase of the research, some of these potential concerns were overcome. Ethical approval for my study was granted by the University of Gloucestershire and the letter of ethical approval is evidenced in appendix 4. Pring (2015) and Cohen *et al.* (2007) also highlight the role of the researcher in how the findings are interpreted. I have considered how to ensure the validity of the findings and how to ensure the findings are not misinterpreted.

4.8 Validity and reliability

This part of the chapter begins with a discussion about the validity of this study and concludes with a discussion about its reliability. Validity is defined in this chapter as being how well the data measures what it intended to measure. Reliability is described as where data and findings are either replicable or credible.

Cohen *et al.* (2007) suggest that for research to be valid it should measure what it claims to measure. Shadish *et al.* (2002) describe validity as generalisability which is achieved to a greater or lesser degree (rather than being either valid or invalid). I suggest that my study has limitations, in terms of its generalisability. This is because the study uses a small sample within a small locality. However, Lincoln and Guba (1985) propose, that by providing a thick description of the research (or rich description), validity is ensured. This is because a rich description enables the

reader opportunity to make decisions about how the findings may be mirrored within differing contexts. This study provides a rich description at all stages of the thesis. It achieves this through how it presents and describes the data collection, data, and data analysis.

Lincoln and Guba (1985) consider, how in qualitative research the researcher can offer a thick description in both the presentation and description of the data. In this study into school improvement, the clarity of description around initial and secondary coding at each phase, and the use of in-vivo coding (Charmaz, 2006) to represent words the teachers said (such as 'fizzle out') provides this thick description. This is provided in chapters 5 and 6.   Use of the transcripts to demonstrate how initial themes were identified provides, what Andrews (2003) describes as, a logical link between the conclusions made and the data.

In 6.11, descriptions of how Complexity characteristics were absent from some teacher's interview data were supplied. This supported the thick description and explanation as to why certain question sets were chosen for further investigation. Exemplifying the decision made to revisit a characteristic, provides the reader with the process between the choices that were made, by using examples from the data. Similarly, a description as to why saturation was believed to have been reached was provided for each teacher using examples from the data. This ensured that the research approach was transparent. Auerbach and Silverstein (2003) agree that this transparency should be used to ensure the reader is informed about the processes and decisions made. They suggest this adds to the validity of the research findings.

Auerbach and Silverstein (2003) also state that, for the purposes of validity, it is important that the reader can understand the processes around data collection and interpretation of the data. In this study, in chapter 5, the thesis describes in detail how Complexity characteristics were grouped to form question sets (5.51 – 5.58). Additionally, the interview questions for each question set, is shared within the appendices 5 – 12, as is how the questions sets were used with each teacher (Table 4).   The reasons for why each question set was chosen for each teacher in each phase, is also explained in 5.9. Similarly, in 6.11, (that describes how Complexity supported the data analysis), descriptions of how characteristics were absent from some teacher's data have supported the explanation of why question sets were

chosen for further investigation. Exemplifying the decision made to revisit a characteristic, helps to understand a particular teacher's experience, or the importance of a characteristic when exposing teacher perceptions of school improvement. Describing the choices made and using examples from the data, demonstrates the reasons for focusing on a particular characteristic. Similarly, it has been explained as to why saturation was believed to have been reached, for each teacher, and at the end of each phase. This was achieved by clarifying why the characteristics no longer needed further investigation. In describing why question sets were selected at each phase and why saturation was reached, I have been transparent in my decision making. This has ensured that the reader can understand the data collection processes and the links between the data and the findings.

Lincoln and Guba (1985) recognise the need to validate the findings with the participants of the study. A focus group, used within phase 6 of the data collection, validated some of the findings from the interview phases. This included whether teachers perceive schools as trying to fix, as Rittel and Webber (1973) suggest, wicked problems. The themes and characteristics directing the focus group discussions is also provided (in chapter 6) supporting the transparency of the data collection and analysis in the later phases of the research. In addition to validating some of the Complexity characteristics that were missing from the teacher perceptions, the group also confirmed that the key themes (identified in the interview phases) were, as I described. This conformation, that the data had been interpreted correctly, was validation of the theory that emerged from these findings. In providing an explanation of the conclusions made from this data there is a suggestion of validity.

External validity should, according to Morrison (2001), ensure that the researcher has not overlooked alternative outcomes. In this study this is represented in the findings that included both the positive and negative tensions in school improvement. The data clearly stated the challenges associated with school improvement and it was not as clear initially that there were tensions that stimulated positive change within a school. This could have been overlooked but instead was used in the decision making about future data collection, as it was useful to the emerging theory. Additionally in 7.3, there is a discussion about how the data analysis from phase 1 –

5 impacted on the data collection and questioning of the focus group. Within this discussion I note, that as a school leader, I have seen schools try to solve Rittel and Webber's (1973) highlighted wicked problems. I therefore then explain my decision to question participants within the focus group about this aspect of school improvement. Here it is evident that I did not overlook potential outcomes and ensured that this perception was not excluded from the findings.

However, it could be argued that this example (of trying to identify wicked problems in the data by questioning the focus group) was evidence of researcher bias, as these perceptions had not been evident in the teacher interviews. Onwuegbuzie and Leech (2206) consider researcher bias to be a threat to the internal validity of research. Alternatively, Lincoln and Guba (1998) consider that this limitation to the validity of the findings can be overcome by clarifying the bias. In chapter 1, I have shared my professional background and personal and professional rationale for the research. I also provided transparency around the questions asked in phase 6 at the focus group (in 7.3). I would therefore suggest that I have been transparent about any bias and that my professional bias has, in this example, offered an insight into teacher perception that would otherwise have been missing from the findings. The researcher's impact on the data is further discussed in 1.1 (with my reasons for using Complexity Theory) and in 1.2, where I discuss why I believe Complexity as a suitable lens through which to study improvement in schools. Researcher bias is also discussed in 5.7, when the choice to use Complexity Theory in the interview questions is considered.

The choices made at each stage of the research have been described and a rationale for these decisions have been given throughout the thesis. Therefore, I propose that the findings of this study can be considered valid. However, due to the small sample size used and the small locality in which participants were taken from, the study could be considered to have limited reliability.

Cohen *et al.* (2007) suggest that reliability is another word for replicability. They consider that the findings of a study should be replicated if another researcher were to complete the study at a different time and with different (in this case) teachers. I have suggested within my conclusions that in this study this may not be the case. Lincoln and Guba (1985) offer an alternative definition of reliability, preferring instead

to consider whether the findings are credible (rather than replicable). This would mean that if another researcher used the same methodological approach, they may find differing perceptions of school improvement with their group of teachers. However, Lincoln and Guba (1985) would suggest that both sets of findings could still be considered reliable. This thesis offers a transparent description of the methodological design and therefore the research instruments and approach could be reliably implemented within another context. This would enable another researcher to reproduce this research within another context using the same groups of Complexity characteristics. Reliability is also offered through a description of how each characteristic was explored within the interviews. This could also enable another researcher to carry out the same interviews in another context. However, it is possible that even when the methods are replicated, differing findings may emerge

I suggest, that due to the clarity I have provided in this thesis about each stage of the study, my findings can be considered credible. I also tested the findings with the focus group and gained a consensus from the teachers.

This study has provided valid data supported by a thesis that offers a rich description at each stage. I have suggested that the findings cannot be generalised. Another researcher may replicate the study but may not replicate the findings. However, in providing clarity about how the findings emerged from the data, I have ensured that the study's findings are trustworthy.   Lincoln and Guba (1985) argue that clarity ensures trustworthiness and therefore reliability.

4.9 Chapter four conclusion

This chapter demonstrates how traditional reductional methods are not suitable for researching school improvement. Instead, it offers a theoretical alternative, the use of Complexity Theory to support the data collection and analysis process. The chapter has also suggested how using an approach like that of Constructivist Grounded Theory, the research process was able to adapt to emerging theory. In offering a structure to the thematic response to research that Grounded Theory offers, this methodology has aligned itself with Complexity Theory by removing artificial boundaries and allowing the complexity of the narrative to prevail. This merging of the two methodologies has also addressed a concern about morality.

Through enabling open coding in the latter stages of the research, a theory with its grounding in mathematics and computer science has been enabled to respond to the values, emotions, and perceptions of the teachers. The values, emotions and perceptions of teachers can be discussed and prioritised in the data analysis and theory development. The chapter has also described the ethical and validity considerations given throughout the methodological design and study. How these methodological considerations were put into practise is now considered in chapter 5.

Chapter Five

Methods: sampling and research instruments

5.1 Introduction

Chapter 4 identified the theoretical considerations of the methodological approach taken. Chapter 5 describes how this approach impacted on the methods used in the design, collection, and analysis of the data. This chapter will describe the sampling used for the semi-structured interviews and the focus groups, the research instruments and their limitations, and how the research instruments were designed. A description follows of how the interviews were conducted in a non-linear way, with a discussion on the impact of this on the research. The coding and choices made in the analysis are then exemplified.

5.2 Sampling and saturation – Teacher interviews

Teachers were chosen from three schools, one in an academy trust and two local authority schools. This sampling used was non-probability. Staff at the schools that were asked to be involved were requested to volunteer to participate in the study and the sampling considered age, gender, previous experience and professional roles in school. The sample consisted of six teachers who had more than three years experience of working in schools. They were all current practitioners and aged between 23 years old and 55 years old. This was to ensure that they had enough experience of school improvement to reflect upon and that a range of age groups were represented. Teachers with less experience were not included in the sample. All were able to discuss differing experiences of school improvement from a variety of schools, which was a strength of the sample. There were five female and one male teacher, reflective of primary school staffing composition. The teachers held a variety of roles within the schools, some on the senior leadership team and the others with differing leadership experience. This ensured that a range of teachers' experience was captured, not just those in more senior positions in the school. This is illustrated in Table 1. All the teachers worked full-time and in the primary sector.

Teacher	Senior Leadership experience	Main and current, leadership role	Other leadership roles held
Teacher 1	Not a senior leader	Early Years Leader	Mentor of NQTs and ECTs
Teacher 2	Senior leader (not Head or Deputy)	Maths Leader	Previously a PE Lead and a Leader of Key Stage one.
Teacher 3	Senior leader (not Head or Deputy)	Special Educational Needs Coordinator	
Teacher 4	Senior leader (not Head or Deputy)	English Lead	
Teacher 5	Not a senior leader	Phonics Lead	
Teacher 6	Not a senior leader	History Lead	In the English team

Table 1: The interview sample.

The interviews were transcribed and identified using a code. The code included a letter and three numerals, for example, A2:2.3. Each interview set (grouped according to a Complexity characteristic) was given a letter, A through to H. The numeral that followed the letter, described the number of times the teacher had been asked questions from this question set (or characteristic).

This number and letter were followed by a colon and two numerals. The first numeral identifies the teacher number (1 – 6) and the second, the interview number.

For example, A2:2.3 identifies the interview schedule, agents and interdependencies (interview set A), the second time this interview set had been asked to the teacher, teacher number 2 and their 3rd interview (so within the third phase of the research).

The same six teachers were interviewed in phase 1 to 4, or 5. One of the 6 teachers was interviewed four times and 5 teachers were interviewed five times. In using Complexity characteristics to code the transcripts, saturation was considered to have been reached once the same characteristic interview set was identified for a follow up interview more than twice, without any further need to clarify the information previously shared. This suggested that the teacher had exhausted the discussion on the school improvement experiences that they wished to share. After the interviews were considered complete, coding of the transcripts was completed using both Complexity characteristics and line by line coding. This supported the evidence that

saturation had been reached when no new characteristics were identified in the coding.

Using the same interviewees/teachers for the interviews enabled an in-depth discussion that exposed the teachers' perceptions. However, it also was not without its challenges. The expectation of a teacher to commit to this number of interviews over an eighteen-month period was significant. It was challenging as a researcher to keep the teachers engaged in the research. One way that this was overcome was by analysing the data at the end of each phase (prior to beginning consequent phases). Analysis after each transcription ensured that I was able to reflect with the teacher at the next interview what had been discussed. This demonstrated to the teachers that I had listened to and taken interest in the detail of what they said and that I wanted to know more about it. This encouraged the teachers to continue to participate, as they could see that their voice was being heard.

5.3 Sampling – Focus group sampling

The focus group consisted of a further, different set of six teachers from two of the three schools used at the interview stages. These teachers also had at least three years' experience in schools, were aged between 21 years old and 58 years old, for the reasons already discussed. The teachers were all female. The teachers also had a range of leadership experience, as detailed in Table 2. Teachers without this experience were not included in the sample. The teachers knew each other as colleagues but did not all work at the same school. This gave a range of experiences from a range of primary schools but ensured there was familiarity between the teachers which led to a purposeful discussion. All the teachers worked in the primary sector and worked either full or part-time.

Teacher	Senior Leadership experience	Main and current, leadership role	Other leadership roles held
Teacher 1	Previously a senior leader (Deputy Head)	Early years leader	None
Teacher 2	Not a senior leader	Humanities leader	None
Teacher 3	Not a senior leader	English leader	None
Teacher 4	Senior leader (not a Head or Deputy)	Pastoral support and parent collaboration	Line manager for teaching assistants
Teacher 5	Not a senior leader	Personal, Social. Health education (PSHE) Religious education	None
Teacher 6	Not a senior leader	Mathematics	Computing

Table 2: The leadership roles held by teachers in the focus group.

5.4 Research methods

An illustration follows, of how the eight interview sets were used in a non-linear sequence. A description of how each question set was chosen is then given, with examples.   Further examples follow to describe how saturation was reached for each teacher in relation to the Complexity characteristics in the initial coding.

Table 3 then details the coding used in the initial and secondary stages of coding the interviews, and the relationship between the secondary coding and the key themes. (The coding of the focus group data is shared in 7.5, in Table 8).

5.4.1 Semi-Structured Interviews

This part of the chapter introduces the use of semi-structured interviews and focus groups and outlines the considerations for their implementation. The limitations are then discussed. The interview design is then outlined, including an explanation of how the characteristics of Complexity were grouped for each question set.

Cohen, Marion, and Morrison (2007) suggest that interviews are recognised by some researchers as different from conversation because they have a specific purpose in mind. The purpose of interviews might be, to assess 'people's perceptions,

meanings, definitions of situations and constructions of reality' (Punch, 2009, p. 144). Gilham (2005) offers an alternative view, that interviews are a representation of what the researcher is expecting to find. I would propose that using interviews to collect primary data can enable people can generate new knowledge together. Kvale (1996) supports this view. It also indicates that I agree with the view of Cohen *et al.* (2007), that interviews can create new knowledge through understanding people's interpretation of the world.

I used semi-structured interviews in phase 1 through to 5. Brinkmann (2014), Briggs, Coleman, and Morrison (2014) and Morrison, (1993) describe this type of interview as being part of a continuum, positioned between structured and unstructured. Wengraf (2001) however, describes how a semi-structured interview can vary depending on the balance between standardisation, structure, and interviewer intervention. The interviews in my study can be described using Wengraf's (2001) criteria, as they will involve asking interviewees a set of questions on standardised themes, with an opportunity for the interviewer to be flexible with their response and further questioning (Wengraf, 2001). This opportunity for spontaneous response and spontaneous questioning, based on what the teachers' said, suggests that while pre-preparing questions based on Complexity characteristics, I am still offering a semi-structured interview to teachers.

Interviews that are un-structured are described by Newby (2007) as providing data that is rich in information, and are considered by other researchers, such as Cohen *et al.* (2007), as enabling the interviewer to understand the participant's interpretation of the subject being discussed. In my study, it was important to understand how the teachers interpret their experiences, through descriptions of school improvement. It might be argued, that in providing a structure for the questions, I was unable demonstrate bias, however, in providing additional questions or prompts that are spontaneous to the teachers' responses, the data was influenced by the researcher. However, I agree with Tuckmann (1972) who states, that the lack of structure around expectation of response may enable the researcher to gain data as to what a person knows, thinks, and feels. In having a flexible response to answers and offering spontaneous responses to questioning, the teachers were enabled to give a thorough explanation of how events happened, and as Newby (2010) describes what impact and meaning this had for them. Semi-structured interviews therefore offered

me opportunities for comprehensive examination (Newby, 2010) of perceptions of school improvement. By ensuring that teachers could be flexible in their responses, encouraged, as Briggs *et al.* (2014) suggests, the teachers to provide more information and more detail. It also gave the opportunity for teachers to, as Seidman (2006) proposes, reflect on their point of view. However, the structure offered by the Complexity characteristic also ensured that the discussion remained focused on the system, agents, and their response to school improvement.

The opportunity for spontaneity (Cohen *et al.*, 2007) within a semi-structured interview enabled me to gain a thorough understanding of what Briggs *et al.* (2014) describe, as the lived experience. Through an unstandardised response to standardised themes, I was able to spontaneously provide follow up questions that opened new levels of enquiry and clarified understanding (Newby, 2010). The complex nature and constructed concept of school improvement undoubtedly caused teachers to engage in discussing a range of topics. Brinkmann (2015) argues, that the use of spontaneous responses enables the researcher to focus the conversation onto topics of interest to the study. Brinkmann (2015) also suggests that using this approach supports understanding ambiguities in the data, and Briggs *et al.* (2014) argue that in addition to this, inconsistencies can be rectified using flexible responses to interviewees answers. I believe that by encouraging a deeper understanding through further questioning, the interviews enabled the teachers to rectify any misunderstandings (Cohen *et al.*, 2001; Oppenheim, 1992), or misconceptions (Oppenheim, 1992; Patton, 1980). Or, as Patton (1980) concludes, the further questioning (a result of spontaneous responses) enabled me, to address gaps in the data (Patton, 1980).

The semi-structured interview can therefore be seen as a 'flexible research tool' (Briggs *et al.*, 2014, p. 250) as they enable the interviewer to alter their response and questioning to suit a particular situation. By researching alongside the teachers, I was able to assess what Briggs *et al.* (2014) considers, important non-verbal clues and determine why certain information may be deliberately excluded. Within the interviews, teachers shared situations that were personal and emotive. With the flexibility in response that semi-structured interviews allowed, I was able to assess whether the teacher, at these times, would benefit from a change in direction of questioning. Wengraf (2001) recognised the importance of noticing when a question

is not answered thoroughly, and at times this also indicated important information about the teachers' experiences. These exclusions were then explored within a later interview phase and question set.

Cicourel (1964) recognises how interviews will differ, depending on the amount of trust or difference in social backgrounds, between the interviewer and interviewee. Cicourel (1964) argues that this is because, while interviewees may aim to provide clear meanings, these meanings may not always be fully understood by the interviewer. Pring (2015) supports this view, explaining that it might be the language used that causes miscommunication. He also suggests that there might be a lack of understanding because of the differing experiences and values between the interviewee and interviewer. It was important for me therefore, to create a shared language when discussing key themes. This was achieved by providing some time to discuss the key terminology (particularly before the focus group discussion) but was also supported by the teachers in the sample having three years primary school teaching experience.

As a result of differing values, understanding (Pring, 2015), and experiences of school improvement (mine compared to the teachers), Cicourel (1964) recommends that the questions asked might exclude topics that are important to the interviewee. Gilham (2005) agrees, stating that the researcher's views might impact on the interview. By providing questions that lead discussions into themes, rather than questions that encourage interviewees to give opinions about these themes, Brinkmann (2015) argues that impact can be limited. Enabling interviewees to provide an unstructured response that is not restricted, as much as possible, allowed interviewees in my study to thoroughly cover a theme. Gilham (2005) states, that it will also be important to ask questions that clarify, what I 'expect to find', 'prefer to find' and 'hope not to find' (Gilham, 2005, p. 9), to critically assess the impact on the data. I used the Complexity characteristics to achieve this.

Wengraf (2001) argues that data inaccuracies might occur in cases where interviewee's accounts deviate from what really happened, even when interviewees intended to tell the truth. Similarly, the interviewee may use avoidance in their responses (Cicourel, 1964), or their responses might be 'ambiguous and full of gaps'

(Brinkmann, 2015, p. 288). Pring (2005) argues that these disparities are not a limitation but will help the researcher understand why things happen.

The interview experience may be different for different teachers, and this might be suggested as a limitation. Newby (2010) recognises that there could be a time differential between different participant's interviews, causing the data to be effected by experiences and events outside of the interviewer's control. The loose structure of the interview may, through varying amounts of intervention by the interviewer (with questions or silence), potentially change the direction of discussion (Wengraf, 2001) and data collected. I would argue that it is more important to ensure a richness of knowledge and understanding, than to provide an equitable content of questions to each interviewee, or to standardise the interview experience more than was necessary, as I had already created this boundary through predetermining the question sets.

5.4.2 Focus groups

Morgan (2012) describes focus groups as a form of interview, where the study of the interaction between participants is vital. Morgan (2012) cites the work of Macnaughten & Myers (2004) who differentiated between two types of focus groups: conversational and content orientated. I determine that the type of focus group I used was content driven, as there was a specific focus given to the direction of the conversation. This is in comparison to a conversation driven focus group, where the participants drive the content of the discussion. Morgan (2012) suggests that a content driven focus group considers more about what is said, rather than how it is said. Morgan (2012) recommends compromising between these two approaches, by considering the interaction and the content being discussed. This, he proposes, supports the construction of meaning.

Kamberelis and Demitriadis (2014) offer an alternative description, by explaining how the term focus group emerged from marketing research but is used to describe a group of individuals engaging in a focused conversation. They describe how the group conversation can be controlled to a greater or lesser extent, depending on the researchers' intentions. In the focus group conversation in this study, areas of focus were identified for discussion, however the group controlled the direction of the

conversation within these topics. According to Kamberelis and Demitriadis (2014) this is a strength, as it takes the control from the researcher so that the participants can 'own' (to Kamberelis and Demitriadis, 2014, p.324) the interview. Sarantakos (2012) contrasts this view with that of a positivist researcher, who would expect objectivity to be of concern, so the participants should not be directed in the discussion. To contrast this, Sarantakos (2012) recommends instead, that offering generalised points at the beginning of the discussion can stimulate the conversation. Sarantakos (2012) notes, that those working from an alternative paradigm, such as interpretivism, would not consider this objectivity concern important. In my study, teachers were guided to ensure that the conversation was of interest to the emerging theory. This was required when a topic had been saturated, evident either through a prolonged period of silence, or repetition of points by the teachers.

Mitchell (1999) recognises that focus groups can be used to explore common experiences, such as school improvement. Stewart and Shamdasani (2015) suggest that this exploration can take place when the group have enough common ground. In my study, the teachers all worked in primary schools, had some leadership experience, and had experienced school improvement over at least three years. This insinuates that they would have the common ground to enable a discussion about a school system. Stewart and Shamdasani (2015) also concur that focus groups enable participants to consider and debate alternative opinions. This was important in the final phase of the study as this had not been possible in the semi-structured interviews that preceded this discussion. Cohen *et al.* (2018) support this approach, suggesting that a focus group can provide a collective understanding.

The opportunity to discuss subjects that the teachers have all had experience in, gave them an opportunity to, as Morgan (2012) suggests, compare, and share experiences. This has the positive outcome of ensuring that teachers expanded on their shared points of view. This also gave the teachers the opportunities to agree and disagree with each other. This was evident in my focus group and helped support the development of the conversation and added additional detail that might have been missed. Cohen *et al.* (2018) support this view and state that it is important to consider how participants agree and disagree with each other, a strength of this research method.

Kamberelis and Demitriadis (2014) state that in focus groups it is important to consider the subtexts of any conversation. What participants do not say, but exclude from the conversation is of importance, including focusing on gestures and how participants respond to one another. Kambrelis and Demitriadis (2014) recommend taking notes throughout the focus group to record the subtext of conversations. I was able to record and note any expressions or gestures that were not evident through the transcripts (through my memo writing), which was of use during the analysis. It was also useful during the focus group discussion as it enabled me to consider follow up questions as part of the discussion.

As a post research technique, a focus group can, as indicated by Dreher and Dreher (1991) and Morgan (1998), offer insights into trends of opinions and attitudes. This was the expected outcome of the focus group I used. After analysis of the interviews, the areas of interest to the theory were considered within the focus group discussion. This provided an opportunity to test ideas and consider patterns in the perceptions of teachers. It provided an opportunity, as suggested by Sarantakos (2012) for conclusions to be drawn, by the group, and for teachers to come to a consensus.

Kamberelis and Demitriadis (2014) consider the practical limitations of focus groups and the concern of a lack of anonymity of the participants. It was important to consider a suitable location for the focus group to ensure all the teachers felt comfortable. The location was neutral to all involved and was a room used previously for professional conversations. Part of the informed consent included a discussion about confidentiality, as anonymity could not be achieved. Understanding how the conversation content should stay within the confines of the group discussion, was important. An explanation of how the findings would be presented was also shared.

As anonymity could not be achieved, in the context of a focus group, Watts and Ebbutt (1987) suggest that issues that are personal to individuals will not be discussed. Cohen *et al.* (2018) offer an alternative view as they argue that it is the collective response that is being sought at this stage in the research, rather than a personal, individual view. The focus group was used in the final stage of the research, after the personal views of teachers were gained in the earlier stages of

the research. The focus group was being used to gain a consensus and to confirm patterns within the theory development, therefore this was not a limitation to consider in this study.

Morgan (2012) recommends that the researcher defines what is being discussed, at the beginning of the conversation. This could be considered a limitation as it pushes the researchers' agenda onto the participants. This was a limitation that I considered when I shared with participants the content of the focus group discussion. I tried not to share my opinions on what was to be discussed and focused on the analysis of the interviews and how this has suggested areas for further consideration in the final stage of the research.

Sarantakos (2012) considers that limitations might include, participants not feeling confident to give their view, individuals dominating the discussion, some participant not joining in with the discussion, and some participants going along with the leader of the discussion rather than sharing their own alternative view. These were limitations that I considered during the discussion, as Sarantakos (2012) suggests as possible malfunctions of the focus group, rather than limitations preventing this research method being used.

5.5 Research instrument design
This part of the chapter explains the decisions I made in my approach to the design and implementation of the data collection.

Initially, I grouped the Complexity characteristics according to whether they could be used in the description of each characteristic's definition (this is discussed in more detail in 5.51 – 5.58). For example, to describe the term bifurcation point, the characteristic equilibrium would be necessary. Therefore, I grouped these two characteristics for the purposes of the interviews. The groups were given a letter label, from A – H, so that they could be identified when numbering the interviews for analysis. The groupings are listed in Table 3.

A	Agents and interdependencies
B	Emergence, temporality, and feedback loops
C	Equilibrium and bifurcation point
D	Self-organisation and loose coupling
E	Non-linear systems, unpredictability, and spontaneity
F	The whole is greater than the sum of its parts
G	Complexity reduction and boundaries
H	Connectivity and interconnectivity

Table 3: Characteristics grouped for interviews.

A set of questions were then written to reflect the concepts within each groups' characteristics. Each set of questions explored the characteristic of Complexity assigned to the group, through a school improvement lens. These questions were the focus of each interview. How the characteristics were grouped, and the focus of the question sets are now described in 5.51 – 5.58.

5.5.1 Group A - Agents and Interdependencies

Hetherington (2013) describes elements of a system as agents who connect via interdependencies. Question set A explored the Complexity characteristic of 'Agents' and the relationships between them. Cilliers (2000) recognises the importance of the element's (or agents) memories of change and the impact this has on school improvement. Byrne (2005) argues that the relationships and interactions between the agents in the system, are important in understanding the impact on school improvement. The interactions between the agents were therefore the focus of the first group of questions.

5.5.2 Group B – Emergence, temporality, and feedback loops

Question set B focused on the emergence of change: the interview questions considered how systems change over time. Complexity Theory recognises the importance of time or temporality (Nunn, 2007; Mathews, White and Long. 1999; Byrne, 1997) in the emergence of change in a system. Set B's questions considered how important the concept of time was in the interviewees' perception of school improvement.

Within the passing of time there are feedback loops (Weick 1976) and these impact on the emergence of school improvement and change. In these interviews, questions considered how feedback loops might occur, in schools, over time.

5.5.3 Group C –Equilibrium and bifurcation point

Kersher and McQullan (2016) and Smith (2013) suggest that change in a Complex system occurs when a state of equilibrium is challenged at the point of bifurcation. Through my questions in set C, I confirmed with participants the system's state of equilibrium (Kersher and McQullan, 2016), and how school improvement was perceived to occur, after equilibrium was challenged. I also looked at whether a new equilibrium was perceived to occur at different points within the improvement journey. The questions tried to identify, whether equilibrium across the system was ever possible, in a school where improvement was a consistent focus.

5.5.4 Group D – Self organisation and loose coupling

The interactions between subjects (Orton and Weick, 1990) or agents, may be created through self-organisation (Cochran-Smith *et al*. 2014; Kershner and McQuillan, 2006; Morrison, 2008) a key characteristic of Complexity theory.   These interactions may form agents who are, loosely coupled. Set C's questions recognised this and focused on the perceived impact of loose coupling and self-organisation between teachers.

5.5.5 Group E – Spontaneity, unpredictability, and non-linear systems

Byrne (2005) proposes that spontaneous changes occur in schools and will therefore impact on improvement strategies. Changes that occur spontaneously will also impact on how teachers perceive their individual situations. Therefore, the questions in set E considered the impact of spontaneous actions in school.

Within this set of questions, I queried whether the unpredictability associated with complex systems, impacted on school improvement. I also wanted to understand whether an unpredictable, spontaneous action enabled schools to predict situations in future school improvement strategies. Through these questions, the characteristic on whether these systems were non-linear, was uncovered.

5.5.6 Group F – The whole is more than the sum of its parts

Turner and Baker (2019), Schreens (2015). Cilliers (2000) and Davis and Samara (1997) determine that the activities and interactions that occur during the process of school improvement, have outcomes that are greater than the sum of their interacting parts. Group F questions identified whether teachers recognise this feature of Complexity within the school improvement process, or whether there were occasions that the whole equalled less than the sum of its parts.

5.5.7 Group G – Complexity reduction

In set G, I planned discussions about situations that may describe Complexity reduction and the impact this had on the system and school improvement. Questions aimed to determine whether teachers perceived strategies to have had the impact they were designed to have and whether they also had an impact on improvement elsewhere in the system. The questions also considered whether school improvement was designed to develop strategies to solve problems that are connected to much larger 'wicked' (Rittel and Webber, 1973) societal challenges.

5.5.8 Group H – Connectivity and interconnectivity

This group of questions were written to explore the interactions between the teachers or agents in the system. How connected to others the teachers perceived themselves to be, was an important aspect to this question set.

5.6 Using the question sets in a non-linear method

Mirroring a characteristic of Complex systems, the interviews sets were asked in a non-linear order. Instead of determining the order the questions would be asked in and pre-determining which questions would be asked to each teacher, subsequent question sets for each teacher, were chosen according to the analysis of the previous interview. A pictorial representation of this is illustrated in Figure 12 below.
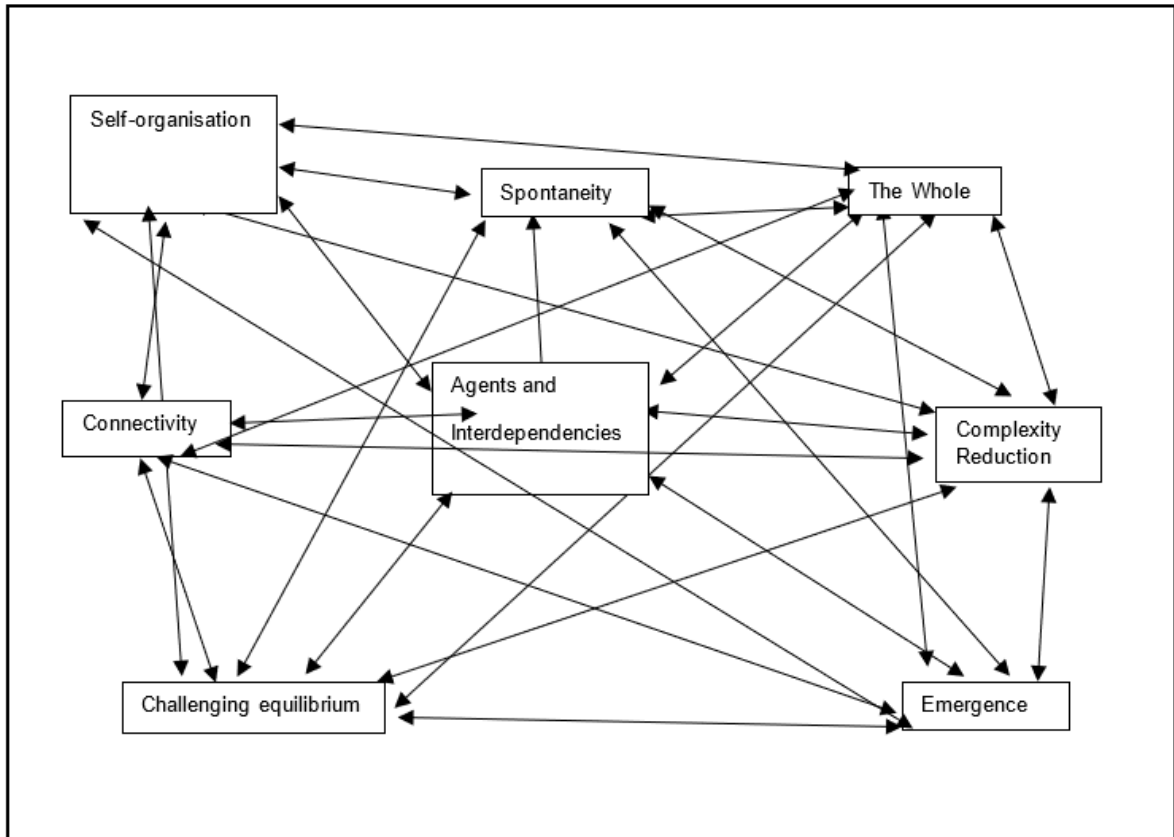
Figure 12: A illustration of how the interview sets were placed in a non-linear order.

After the initial interviews, where all teachers answered questions from set A (agents and interdependencies), the data was analysed. I then chose the most appropriate group of questions, related to the answers the teacher had given. After each interview (or phase) the next set of questions were chosen. By placing the question sets in a non-linear order, Figure 12 illustrates how the question sets could be asked in any order, at any phase of the research. By placing the interview sets in a non-linear order, Figure 12 also suggests, that the question sets can be revisited, depending on what was identified as being, as Cilliers (2000) and Davis and Sumara (1997) describe, of most benefit to enabling the theory to emerge. Placing the questions sets in a non-linear order, offered opportunities for further understanding, often building on an interpretation of what a teacher had described before. This is necessary because understanding something from someone else's perspective is not linear and therefore requires a non-linear response. As we gain knowledge, experience and understanding, we notice similarities and aspects that challenge our

narrative. We see things again, but from a new (sometimes more knowledgeable) perspective. Our knowledge, experience and understanding of an idea, therefore develops in a non-linear way, hopefully refining and deepening our comprehension as we revisit. This approach to research allowed for a deeper understanding, and opportunity to revisit or expand on themes described by the teachers. The sequence that the question sets were asked to each teacher is detailed below in Table 4.

Teacher	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
1	A – Agents and Interdependencies	D – Self organisation	H - Connectivity	B - Temporality	A – Agents and Interdependencies
2	A – Agents and Interdependencies	H - Connectivity	F - The whole	B - Temporality	C - Equilibrium
3	A – Agents and Interdependencies	D – Self organisation	F - The whole	B - Temporality	C - Equilibrium
4	A – Agents and Interdependencies	D – Self organisation	D – loose coupling	B - Temporality	B - Temporality
5	A – Agents and Interdependencies	D – Self organisation	C - Equilibrium	B - Temporality	Saturation
6	A – Agents and Interdependencies	C - Equilibrium	F – The whole	B - Temporality	D - Self organisation

Table 4: Table outlining the sequence of question sets for each teacher.

Table 4 shows how saturation was reached for teacher 5 at the end of phase 4 and that all teachers started with the same question set A (Agents and interdependencies).

5.7 How did my approach impact on the interviews?

In the data analysis it was sometimes evident that, to gain a clearer understanding of the teachers' perception, more information was needed. For example, teacher 2 described a school improvement strategy with little explanation as to what the impact of the strategy was. This was able to be addressed in the following interview with the use of the question set F (whole is greater than the sum of its parts). This preceding interview highlighted that teacher 2 was unsure about the impact and highlighted instead that there was a lack of understanding and knowledge about the strategy's outcome. This highlighted that, while it appeared that the teacher was suggesting that a strategy was delivering less than expected outcomes, in fact, there

was a lack of clarity around the strategy outcomes. The iterative approach to the data collection enabled this clarity of understanding of the data.

Often, during the analysis, there were questions raised. For example, teacher 5 focused on different relationships in one interview, providing lots of examples of colleagues that worked together. In the analysis the formality of the relationships, the types of connections made and how these relationships changed over time, were of interest. In offering the question set H, this was addressed through asking specifically about connectivity and interconnectivity.

Teacher 5 identified the school improvement advisor as one of the colleagues the teachers' made connections with. There was a perception that sometimes the school improvement advisor was the stimulus for change. Therefore, the use of question set C, enabled the question to be asked about bifurcation points, with a direct link to the previous interview where the school improvement advisor relationship had been shared. This interview identified that the school improvement advisor was, at times, considered the bifurcation point for change in the school.

The theme of Clarity was beginning to emerge by the end of phase 3. Teacher 2 provided answers in phase 3 that were disjointed, when discussing the starting points and impacts of school improvement. The decision was taken to revisit the question set C to gain further information on the emergence over time of the strategies. This confirmed that the lack of clarity for the teachers on the reasons for starting points and the end points, or impacts over time, were significant in the perceptions of teachers about school improvement.

Question set B was used with five of the teachers because, over time, the teachers began to identify that this was important in their descriptions of school improvement. For all the teachers this was the first time this question set had been asked in any of the phases. At this point in the data analysis, it was important to identify and capture this with the teachers, due to the focus they had placed on it within the previous interview. The use of this question set enabled teachers to vocalise what they had begun to in the previous interview.

Throughout the analysis, a record of each teachers' question set was placed on a copy of Figure 12 (used previously to show how the questioning could be visualised in a non-linear order). When the question set was revisited with a teacher the

characteristic being discussed was highlighted in a darker colour. This information was then combined to create a heat map that illustrated the number of times a question set had been used. This is referred to and illustrated in chapter 6 to support the development of the key themes (also discussed in chapter 6).

5.8 Using a theoretical structure for the data collection – a summary

As an emergent research methodology, this approach to data collection enabled the use of interpretivist methods, reflecting on new data and adapting the data collection as theories emerge. However, it also provided a pre-determined theoretical structure within the research design. The theoretical structure provided a framework from which theories emerged, thereby bridging the gap between linear and non-linear research methodologies.

5.9 The analytical process and saturation

As previously described, behind each group of characteristics (shown in Figure 12) are a predetermined set of questions (exemplified in appendices 5 – 12). These questions focus on each characteristic, but also seek to encourage discussion about the main research question. This approach enabled me to revisit characteristics (or groups of questions) when new information was shared by participants, while ensuring my questioning had a clear focus and identified parameters. This enabled the response to the data to be, as Northouse and Lee (2016) describe, spontaneous. It also ensured that the Complexity characteristics that Morrison (2002) discusses. spontaneity and re-organisation, to be used in the methodological design. It was possible to respond to the data and make connections between the characteristics, rather than following a linear path of questioning.

In the first phase all teachers were asked question set A, agents, and interdependencies. Social systems are, by definition, a series of interrelationships that create a coherent structure. Therefore, the focus of initial data collection was on the individuals and their relationships with others. Each teacher was initially asked the questions developed to encourage discussion about themselves and the people they consider to be a part of their social system (within the boundary of the research question). These were the individuals associated with the teachers' experience of

school improvement. Appendix 5 is an example of a teacher transcript from the first phase. It shows the questions the teachers were asked (from the Agents and Interdependencies question set). It also illustrates the initial and secondary coding. This will be discussed in 5.10.

After this first phase of questioning, analysis enabled decisions to be made as to what social system characteristic should next be chosen for each individual teacher. The characteristic that was considered of most importance to the theory, for each teacher, was the next area of focus for their set of questions. Appendices 6 - 12 provide examples of the questions used in each question set (related to the appropriate Complexity characteristic).

Each interview was initially coded by applying the characteristics of Complexity Theory. This meant that the data was coded using a characteristic of Complexity. Discussions, lines of data, and sometimes examples the teachers discussed were assigned a Complexity characteristic, where suitable. As Suddaby (2015) and Layder (2005) explain, this imposed an order on the data, supporting the initial organisation of the data obtained from interview transcripts. It was beneficial to impose an order, due to the large amounts of dialogue that needed initial analysis. Applying the Complexity characteristics in initial coding also, as Layder (2005) suggests, assisted in identifying patterns. This allowed me to begin to respond to the data analytically and make decisions about each stage of the data collection. It also aided my initial analysis, by enabling me, as Guzman-Valenzuela (2016) concludes, to move from the more general accounts of the teachers to the theoretical concepts. Suddaby (2015) and Layder (2005) recognise how using a theoretical structure, such as Complexity Theory, at the initial coding stage of analysis, can create background abstract categories. These abstract categories, identifiable by the Complexity characteristic they describe, were then used to provide opportunities for me to make decisions about which characteristic should be interrogated next. The abstract categories remained open to change and re-categorisation; however, using Complexity Theory to identify initial 'orienting concepts' (Larder, 2005, p. 108) helped me to make decisions about future data collection and analysis and supported generating, what Layder (2005) describes as, future theoretical developments.

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Initial coding highlighted both the absence of, and significance of, Complexity Theory characteristics in the data. Decisions were then made on how to proceed, by identifying which characteristic question set should next be applied.

In the first phase (and all following phases) and after analysis, characteristics of Complexity Theory were highlighted by teachers. For example, in the first phase of data collection, a teacher discusses a newly qualified teacher (NQT, someone in their first year of teaching, now called an Early Career teacher) in her school. The teacher describes how an NQT approaches another teacher for support. This is described as an action initiated by the NQT, outside of the more formal opportunity of discussing improvements with a mentor, provided to her by the school. This is crucial, as the action describes how the teachers self-organise, for the NQT to improve their practise. To gain further understanding about the significance of self-organisation, the 'Self-organisation' question set was identified for use in phase 2 (the second round of interviews) with this teacher. Similarly, another teacher identifies how she works with her colleague during planning to improve their practise in other aspects of their roles:

> *'We get on well as we work together a lot. We do our action plans together each year and sit down and plan what we want to improve the next year. If there is a problem in KS1 with English, she might talk to me to help me sort it'.*

This implies that they self-organise and therefore this question set was also used in phase 2 for this teacher.

In phase 2, a teacher communicated the phrase 'guessing game' twice, indicating concerns related to the Complexity characteristic unpredictability:

> *'People just want to know what they should be doing and 9/10 times they will do it. It shouldn't be a guessing game'.*

Implying a concern around unpredictability on two occasions during this interview, evidenced that it warranted further investigation. It was also noted that the way the teacher emphasised the phrase 'guessing game', indicated that it was important to her and possibly suggested some frustration around this concept. The decision was taken therefore, after analysis of phase 2, that the 'unpredictability' question set would be applied in phase 3 for this teacher.

After the analysis in phase 2, one teacher identified a point at which everything changed. This could be described as the bifurcation point. The teacher recognised

that a visit from the school improvement advisor instigated a need for change. The teacher remarked how everything changed from this point and therefore, it was considered important for the theory, to clarify this point and research further with this teacher, their perception of when bifurcation points occur. This was therefore the focus for this teacher in phase 3.

The absence of characteristics was also highlighted, in the initial data analysis, at each phase. In some cases, this directed the trajectory for the next phase of questions for these teachers. For example, in phase 2, one teacher was able to discuss, at length, the process of three different school improvement strategies. This included, how training was implemented, how outside experts were commissioned to work with staff, and how policies were rewritten. However, the teacher did not discuss the outcomes of the strategies. This highlighted the absence of the characteristic, the whole being greater than the sum of its parts. To identify whether the teacher was able to identify this within the strategies she remembered, with clarity, this was the question set chosen in the following phase (the third round of interviews).

At the end of phase 4, it was evident that for one teacher, saturation had been reached. This was because there was no evidence that any further clarification, using a different question set, was needed. The teacher had begun to repeat information from previous interviews and was not offering any new information. It was decided that the fourth round, for this teacher, would conclude their interviews.

All the other teachers' transcripts suggested a need for further discussion using the characteristic, temporality. This was notable, as after four interviews, this seemed an important aspect of school improvement that all the teachers wanted to discuss. However, the characteristic of temporality appeared important for different reasons for some of the teachers. One teacher noted that:

'Sometimes things get forgotten quickly…they fizzle out'.

This indicated, how over time, strategies do not have an ending or a conclusion. Another teacher however, considered how over time, school improvement strategies become more successful:

'The more you do something, the more successful it will be'.

This may not always be the case, but her the teacher was explaining how strong initiatives are further embedded in practise when time is given, before moving onto something new. Another teacher supported this but perceived that the challenge was how well an initiative was embedded over time.

> *'We just move on too quickly. We talk about embedding things but that doesn't happen'.*

After using the temporality question set for all the interviews in the fourth round, saturation of the data was reached for all teachers. There were no further suggestions, identified in the analysis, of any characteristics that required further clarification or investigation. All teachers were asked whether there was anything they had not discussed about school improvement, that they wanted to be considered.

There was a notable exclusion of a question set not chosen for use, Complexity reduction. This characteristic was not identified in the analysis and was therefore chosen as an area to consider for discussion in the focus group. This is discussed further in chapter 7.

5.10 Initial and Secondary Coding of Interview Transcripts

Table 5 shows the codes allocated to sections of transcripts in the initial coding. These initial codes are highlighted in Appendix 5. In Appendix 5, the data is highlighted in differing colours based on the Complexity characteristic. This was then used to identify the following question set (or characteristic group) for each teacher.

Initial Codes		Secondary Codes (including *in-vivo* codes)	Themes
Agents and interdependencies		Authoritative bodies	Hierarchy
		Power	
Emergence, temporality, and feedback loops		Leadership	
Equilibrium and bifurcation point		Hierarchy	
Self-organisation and loose coupling		*Fizzle out* – Understanding outcomes	Dissipate
		Opportunities to revisit - Time	
Non-linear, spontaneity and unpredictability		*Forgotten*	
The Whole as greater than the sum of its parts (or less than the sum of its parts)		*Buzz words*	Trends
Complexity reduction and boundaries		Social media	
Connectivity and interconnectivity		*Buy in*	Clarity
		Process	
		Impact	
		Guessing game	
		Training	Training
		Formal and informal roles and relationships	Experts
		External expertise and expectations	
		Internal expertise	

Table 5: Initial and secondary coding from the Interviews (phases 1 – 5) and how these related to the identification of themes in the data.

Table 5 also shows the secondary coding used once saturation of the Complexity characteristics had been reached. The secondary coding is a mix of *in-vivo* (Charmaz, 2006) codes and codes that emerged from the data. *In-vivo* (Charmaz, 2006) codes are written in italics. The secondary codes indicated themes and patterns in the data. These are also identified in Table 5. Appendix 5 illustrates how these secondary codes were allocated and written on the data.

Table 5 shows how the secondary codes supported the identification of key themes at this point in the analysis. These themes are discussed in chapter 6.

5.11 Chapter five conclusion

The use of semi-structured interviews and a focus group discussion were suitable research instruments to use in an approach that aligns itself with Constructivist Grounded Theory and the lens of Complexity Theory. The structure provided by Complexity for the semi-structured interviews with the opportunity for spontaneous questioning enabled me to understand the lived experiences and perceptions of teachers. The opportunity for clarification and further investigation was enabled due to the focus group discussion. However, these research instruments were not without their limitations and how these were considered impacted on the data collection and analysis.

A non-linear model is more suited to a response to the school improvement using the lens of Complexity than researching in a linear way. Grouping the characteristics provided a structure but the non-linear approach impacted on the interviews by enabling me to be responsive to the data as the theory emerged.

The analytical process used both Complexity characteristics and open coding to ensure there was a structure to my analysis while enabling a response suited to school improvement – the study of perception, emotions, and values. The coding of the interviews supported identification of the key themes. These key themes are now discussed in chapter 6.

Chapter Six: Findings and analysis – themes identified after initial coding

6.1 Findings and Analysis Part 1

Chapter 5 described how the data was coded. This chapter moves from a description of the coding to the process of analysis. It also presents an in-depth review of my study's findings from the semi-structured interviews. In the first part of the chapter, the key themes identified from analysis of the interviews are discussed in reference to the relevant aim and objectives of my study. These themes are also divided into subcategories. An analysis is undertaken of each subcategory, where I express my own position on the findings, as well as correlate them to research undertaken by others. The research I cite within this part of the chapter is identified as having relevance to the findings being discussed.

In the second part of the chapter the key themes are considered in relation to the Complexity characteristics they could be aligned to. In cases where the findings could be aligned to more than one Complexity characteristic, this is noted, and an explanation is presented. The findings are discussed in relation to the aim and objectives relevant to this part of the chapter.

6.2 A reflection on the research aim and objectives in relation to the findings (part 1)

Prior to beginning a discussion, it is important to remember the research aim and objectives, pertinent to this chapter. The aim of the research was:

- To understand teachers' perceptions of school improvement.

The aim is therefore to expose teacher perceptions. This is addressed through grouping key themes from the interviews and discussing how these themes are perceived by the teachers.

The themes described in this chapter begin to uncover what teachers understand and experience as school improvement. This is a starting point into understanding teachers' perceptions and what we can learn from the teachers about their experiences. This part of the chapter therefore also aligns with the objective:

- To expose teacher perception of school improvement.

The second part of the chapter considers how these key themes align with the characteristics of Complexity Theory. Therefore, it addresses one of my study's objectives:

- To identify characteristics of Complexity Theory in teacher perception of school improvement.

By identifying the characteristics of Complexity Theory that align with the key themes, this objective is being examined.

The key themes identified after phase 1 – 5 are now discussed. Each key theme has sub-categories which are also discussed. The first is the theme, Hierarchy.

6.3 Key theme: Hierarchy

The Hierarchy theme (identified after phases 1 – 5) describes how teachers perceive differing levels of influence of authoritative bodies or individuals in school improvement. It was evident through the analysis, that power was hierarchical: some individuals or authoritative bodies had greater power or influence within the system and school improvement process. This theme occurred when teachers discussed each part of the school improvement process, from beginning to the end of the strategies. While some individuals were powerful within the hierarchy, they were also considered as having expertise and are therefore also considered within the theme, Experts (that will be discussed later in this chapter). Examples of those in the hierarchy, and their position within the hierarchy (according to teachers), is demonstrated below in Table 6. Katzenmeyer and Moller (2001) were critical of the hierarchical structure found within school leadership, however the teachers in my study demonstrated the benefits and challenges associated with the hierarchical structure. This is discussed further in 6.3.1 – 6.3.3.

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┌─────────────────────────────────────┐
│          Top of the hierarchy       │
│                                     │
│          Ofsted, Local Authority,    │
│       Department for Education, Multi-│
│           Academy Trusts.           │
│                                     │
│                                     │
│          Headteachers, School        │
│          improvement advisors.       │
│                                     │
│                                     │
│            Subject Leaders          │
│                                     │
│                                     │
│         Informal Teams, such as     │
│            Planning teams           │
│                                     │
│                                     │
│              Teachers               │
│        Bottom of the hierarchy      │
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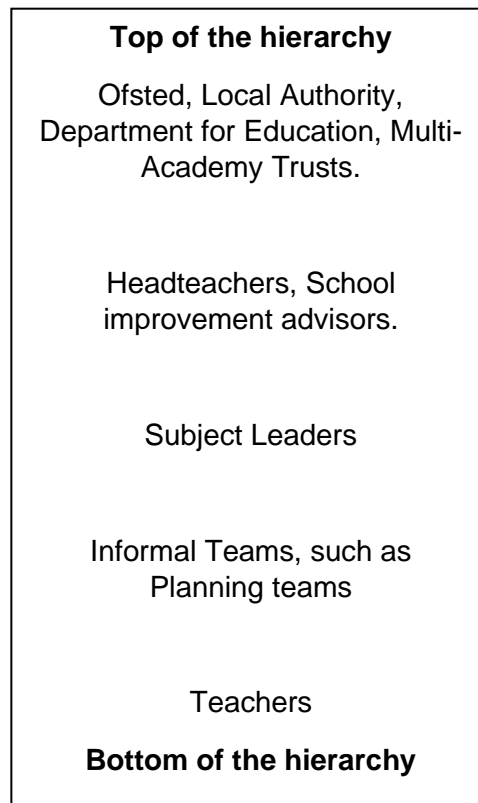
Table 6: The hierarchy of power to influence school improvement change in a primary school.

The power of authoritative bodies, individuals, and teams of colleagues were identified within the analysis, and this is illustrated in Table 6. Authoritative bodies are at the top of the hierarchy and teachers perceive themselves at the bottom. Harris (2001) recognises how power must be exercised within the system because educational school improvement consists of choices to be made on the focus for change and the strategies to be implemented. All teachers in my study considered how, the more power attributed to individuals, the more opportunity there was for change and improvement in their area of the school. For example, when a headteacher was seen to be interested in maths, the teacher perceived that more focus was given to improving mathematics in the school. However, I would argue that in some schools, decision making is distributed more widely, and therefore the perception by teachers that it is not, is important to note.

The following discussion will consider the authoritative bodies that are seen to have power within the hierarchy, followed by the individuals and the teams of colleagues that are also perceived to have power in the school improvement process.

6.3.1 Authoritative bodies

Teachers perceive those outside agencies such as Ofsted, The Department for Education, a multi academy trust, or a local authority, have power when initiating school improvement strategies. These authoritative bodies are considered a subcategory within the hierarchy theme. Teachers identify a knowledge of initiatives that are introduced because of an intervention from these external bodies. These may include, a new Ofsted inspection framework, or a strategy implemented from the local authority identified for improvement in their locality. Tulowitzki (2012) and Mulgan (2000) describes this approach to school improvement as being 'top down' (Tulowitzki, 2012, p. 815): that schools are expected to implement a strategy based on the requirements from above. This suggests that these external bodies have an authority or power over the schools that are considered, by Tulowitzki (2012), as below them in the hierarchy. Tulowitzki (2012) and Mulgan (2000) are critical of this approach, with Tulowitzki (2010) concluding that this is because he found there to be resistance from the teachers that are expected to implement the strategies imposed from above.

In my analysis I noted how one participant remarked, when asked about why school improvement happens:

> *'Ofsted. Plain and simple. Isn't that why we do everything? They said it needed to change. It did need to'.*

While it is recognised that this comment potentially comes after a difficult Ofsted inspection (based on the shortness of the response), this teacher's perception is that those at the top of the hierarchy can impact on the way teachers do their job. However, it doesn't suggest that the teacher was resistant to the change as Tulowitzki (2010) found. This teacher was not the only one to offer the perception that change can sometimes come from an external authoritative body:

> *'The MAT I worked for before wanted the schools to all introduce Forest Schools. That's Ok but we didn't have anywhere to do it. Not like the others, who had woodland in their grounds. This made it really difficult for us. It seemed like that wasn't even considered (laughs). As if, well we just had to do it…yeah, we did need something. Our children don't get to do all that stuff, getting outside and playing, in nature I suppose'.*

Both teachers in these interviews recognise the need for improvement and therefore demonstrate less resistance than Tulowitzki (2012) evidenced in his study of a French school. The 'top down' approach is greeted with acceptance. While there is

some initial criticism and negative opinion, there is an understanding that the strategy was a positive one. This acceptance that this is the way the education system operates, is identified in other teacher interviews too, and in this one by the 'shrug' of the shoulders at the end of the statement.

> *'Sometimes it's about well-being or another Government initiative (shrugs shoulders)'.*

However, Datnow (2022) identifies differing perspectives on the hierarchy within school improvement initiatives. She considers the education reform system in her study of schools in Toronto. In a similar way to those examples offered by the teachers in my study, the reforms she discusses stem from national research rather than localised school-based information. In schools where she found that teachers were not involved in the decision-making process of the reform, teachers did not respond enthusiastically to the initiatives. It appears that the teachers in my study took a more pro-active approach to external initiatives. This is exemplified in the following quote, where an English leader describes how the Department for Education's requirement for schools to implement a validated systematic synthetic phonics scheme, was implemented in her school.

> *'The Government, erm, Dfe, said we needed to choose a scheme from a list. They were the agreed ones. We had to choose something new. Our Headteacher chose one that she had used before…… So, we had chosen a new phonics scheme and we got everyone trained. Then we had to come back into school and make sure everyone was following the scheme…… we had to buy the correct resources, so lesson observations of each other…create a policy to explain what we were doing. I also spoke to the Governors and explained the changes and why we were doing it'.*

It appears from this example, that leaders are willing to implement national reform with some rigour and professionalism, despite potentially not understanding why those at the top of the hierarchy are insisting upon it. The teacher does not offer an explanation as to the Department for Education's requirement, only that it happened and then what they actioned as a result. This exemplifies how teachers consider the authoritative bodies to be at the top of the hierarchy and that they have power over the improvement direction of the school. There does not appear, in this example (or in the others offered by teachers in my study) to be something that they question. I would argue that this questioning does take place but that the level of acceptance the teachers have (possibly caused by the number of changes they experience)

cause teachers to action the change despite this. Potentially, there is also trust in the external research behind these decisions, and an understanding that the hierarchy is in place to support schools (rather than to hinder improvement) and the positive impact on pupils.

6.3.2 Individuals

Individuals, as the name suggests, are colleagues who on their own have power within the hierarchical structure. They are considered here as a subcategory of the hierarchy theme.

Teachers perceive how individuals within the school system also have power to evoke improvement. They are also part of the hierarchical structure. The quote from the teacher above indicates that the headteacher was the individual that made the decision about which phonics scheme the school would ultimately implement. This demonstrates how an individual, suggested in this example to be near the top of the hierarchical power structure, has power in the school improvement process. Moos and Kafod (2009) conclude that, as in this previous example, it is the headteacher who must translate the formal requirements of the external authorities in order that schools can implement the demands. This is recognised by one participant when discussing the implications on teachers of the expectations from authoritative bodies such as Ofsted or the Department of Education:

> 'There is always something new. A new expectation. Maybe something has happened, like, I don't know, black lives matter, or when 911 happened. There is a new focus on schools, a new paper, something else we do. It is right that we should, but nothing gets taken away. It's not just us, it's the Heads I feel sorry for. They work out how to do it. How to get it into schools. Fit it in. They become experts overnight. We get some time, but they don't'.

The headteacher is recognised, not only as someone who interprets the external expectations, but as someone who can bring about change, particularly when it is an area they feel passionately about.

> 'The Headteacher. She makes all the decisions. Ultimately, it is on her head if it goes wrong. She makes the decisions for what next…… She drives everything. What we are doing, what next, what we need to go back to'.

The perception of teachers, that the headteacher is involved in all aspects of school improvement, is supported by the teachers in Tulowitski's (2012) study where the

principals are noted as being involved in a wide variety, in both nature and number of improvement tasks. The teachers in my study recognise this when discussing school improvement, as they regard their headteacher to be driving improvement in all areas, and particularly those that they consider to be of importance. A teacher referenced a maths improvement strategy that was a focus of the school because the headteacher:

'Was into maths'.

However, in Cameron's (2010) research, the headteacher is not the focus of the initial improvement. In his study, the Head of Department is the colleague with whom the improvement discussions begin. This finding could be different to my own, as he was studying large secondary schools where leadership may be distributed further than in smaller primary school settings (discussed by the teachers in my study). I would offer the argument that this could be a reason for the differing findings. Harris (2001) would support this, suggesting that the decision-making focus in secondary education should be on departmental leaders and not just the headteacher who is relied upon to make decisions.

Tulowitzki (2012) and Pelage (2003) also recognise the significance of a school leader in school innovation, describing how a headteacher (or principal, as they were researching within the French education system) were the driver of improvement or the engine of the school. In a similar way to Tulowitzki (2012), who identified a hierarchical school improvement system, the teachers in my study also described a hierarchical structure within the school. However, when other school leaders or colleagues promoted school improvement initiatives there appeared to more flexibility and collaborative working than when working with their colleagues higher up in the hierarchical system.

Teachers recognised their role in leading school improvement by identifying with the area of the school they were responsible for. For example, an early years leader, maths leader and special educational needs and disability coordinator, all described their part in the improvement of these specific areas of the school. While recognising the impact they could have on school improvement in these roles, they also demonstrated an awareness of how power impacts on the ability to bring about change. In cases where these teachers carried out leadership roles while a part of a

senior leadership team (or where they held the role of deputy head) they perceived that this gave them the power to implement change. They believed that the power to implement change was increased. This was not seen as being a result of the need for change in their area, but as a direct result of their seniority within the school.

> *'Also, I am on SLT, so that is important. I think that makes people want to do the right thing'.*

Here the teacher is explaining how her role on the senior leadership team provides her with the power and impetus to bring about change. There is a level of respect that ensures that the other teachers want to support the initiative. Another teacher supports that view when discussing another member of staff:

> *'He is on SLT so that (strategy) gets done first. Before anything else'.*

I would suggest that the hierarchy appears to have some benefits in bringing about change and moving schools forward. Seniority also had advantages for when a new strategy was introduced from further up the hierarchical system and this is discussed in more detail later in this chapter, in 6.6.

6.3.3 Teams

Power for change was also seen within the strength of the relationship teachers had with each other and their teams. These teams are colleagues that together perceive themselves as a group, identifiable by the teachers' perception that they belong to it. These teams are informally and formally developed and are the final subcategory of the hierarchy theme. Wenger (1998) recognised the importance of teachers feeling as though they belong to a community, as these groups of professionals support individuals' learning.

The emergence of a strong working relationships, because of planning learning together over time, or supporting a newly qualified teacher over a year or longer, enabled staff to support each other when they wanted to develop a new initiative. Teams of two or more colleagues are described as implementing an improvement strategy with some success. When asked about whether the success of a strategy was a result of the formal role they held in school or something else, the teacher stated:

> *'Because I am on SLT. Except for those on my team. They would do it to help me out. Like make the changes or improvements. We do it for each other'.*

The teacher here is describing a sub-culture, where the teachers that have close connections create a belief system of their own. Wenger (1998) recognised how sub-cultures are formed within systems, as change emerges. The formation of new sub-cultures is supported by another teacher who was able to clarify the impact of the sub-culture and strength of the team on new initiatives. The teacher is discussing how they had worked for a long time with the same planning team:

> *'If there is some feedback someone has been given, then we discuss that and how we can do it. We work well as a team but that is more on things that we want to do or to improve……That's what makes things better'.*

This indicates that there is power lower down the hierarchy and this power comes from the relationships teachers have with their colleagues or teams. This is discussed further in the theme, Relationships.

Within the hierarchical structure, teachers identified a group of colleagues that demonstrated that they had the power to initiate (and sometimes implement) change in a school. These are called experts and are described in 6.4.

6.4 Key theme: Experts

In this part of the chapter, I will identify who the teachers perceived to be the experts brought into school as part of the school improvement journey, what the teachers perceive them to do, and why they are important in understanding school improvement. I will also consider where the theme of Experts or where expertise has been identified in the literature and research on school improvement.

The experts involved in school improvement can be split into two distinct groups, those who hold expertise within the school and those from outside of the school. Of those who come into school from outside, these can also be divided into two groups. There are, experts called in to support after an area for improvement is identified, and then those whose enforced expertise are more formally introduced to the school (often prior to the areas of improvement being finalised).

6.4.1 Experts within the school

Within the school there are often individuals who are held as experts in their field. This is the first of the subcategory of experts included within this theme. Examples of such experts include the school special educational needs and disability coordinators, English leaders and those responsible for leading the early years (education prior to the national curriculum that pupils access in year 1). Spillane, Hopkins and Sweet (2015) identified how teachers go to colleagues with formal positions (such as the formal role of special educational needs coordinator) as they considered those with a formal title of having more expertise than themselves. This was also found to be the case in my research, where teachers described those in specific roles as having knowledge and experience of how to bring about change for individuals and groups. They were also considered specialists, while often also having their own classes and other responsibilities. Similarly, leaders in the early years were seen as specialists, with skills that other teachers may not have. Their contribution was seen as vital by teachers in the school improvement journey. This is also recognised by Penuel *et al.* (2010) who identified how teachers, requiring advice, will look towards those in their school seen as experts in their field.

This is contrasted with the view of Garrison Wilhelm *et al.* (2016) who argue that it is not the roles, but the perceived knowledge the colleague holds, that pushes teachers to go to them for instructional advice. Teachers in my study also recognised the importance of the relationship between less experienced and more experienced staff (that Garrison Wilhelm *et al.,* 2016, identify), with the more experienced staff being seen as having expertise that they can disseminate. This is exemplified by one teacher who describes her relationship with a newly qualified teacher, whom she no longer mentors.

> *'The NQTs might come to me or someone else and say what they had been told to do (by their mentor). I might give them practical ways to do it. Or give them resources I had made before'.*

This suggests that less experienced colleagues go to those who they feel have the experience to help them. This is supported by Moolenaar *et al.* (2014) who identify how teachers are more likely to request advice from more experienced colleagues. Johnson (2012) contrasts the view by stating that expertise is related to the 'practical knowledge' (Johnson, 2012, p. 40) held by teachers. He concludes that this is held as social capital that influences how teachers respond to initiatives.

Johnson (2012) categorises previous research into the social capital shared by school colleagues, into three groups. The first, is the information or expertise shared between colleagues, exemplified in my example above. The second group describes how efficient the groups are at working together. This is only recognised by one of the teachers in my study, with the following quotation:

> *'We all have teams where we can work together. They can be strong, like ours, or not. So, we can change things as a team if it needs improving'.*

However, in this quotation from one of the interview transcripts, it is unclear whether the team being discussed is effective, or just perceived to be. This is reflected in the final of Johnson's (2012) groupings of social capital sharing. This is the group that he calls 'focus of groups' work' (Johnson, 2012, p. 40). He suggests that just because teachers are working together, does not mean that they are effective in the change process. The teachers in my study notably, did not comment on the impact of their group working on pupil outcomes. They did perceive that the connections between them could be stronger or weaker but not whether this impacted on the outcome of the school improvement. The lack of clarity around pupil outcomes is discussed further within the Clarity theme (in 6.6).

6.4.2 External experts – supporting after the area for improvement has been identified

The dissemination of good practise is recognised by teachers as being provided from external sources in addition to the expertise found within the colleagues in their schools. Those experts, identified to support the school with an area of improvement, are identified in this subcategory of the experts' theme. They do include those experts who are employed directly to work in the school permanently.

This group of experts, identified by the teachers in my study, was also identified by Schein (1988). Schein (1988), who, when writing about the business sector, recognised how a client will initially identify a problem and will then decide who to go to for support to resolve the problem. Alternatively, when discussing the education sector, Allen, Evans and White (2021) question the knowledge and skills of these experts and wonder whether leaders consider unproductive strategies because of the narrative they receive from this group of professionals (that they call experts).

In 1997, Lundburg, identified that the research into consultants who were brought into school was fragmented, and this still appears to be the case, with most of the literature relating to primary settings written in the 1990's. However, in Germany, Dedering, Goecke and Rauh (2015) note that at least 46% of schools in Germany commission experts and Cameron (2010) writing about the secondary sector in London, found that there is a significant number of secondary schools that use consultants to implement change. The perception of the teachers in my study demonstrates that these experts are a significant aspect of many schools' improvement journey.

When asked to identify the experts who work with them to improve the school, one teacher noted:

> *'Oh, so many, maths consultants, moderators, school improvement advisors, task groups, subject teams, cluster schools'.*

This work is identified by teachers as being collaborative, where professionals come together to discuss the problem and devise a strategy (under the leadership of the expert) to improve.

> *'We have a school improvement partner that we work with. In fact, we have two. One helps us with leadership and the other, everything else'.*

The focus in this extract is on helping and working together. Collaboration appears central to this working relationship.

Cameron (2010) would support the view of the teachers in my study, using the views of the consultants that he obtained. In his study of consultants commissioned to support the 2005 Secondary education strategy (Department for children, schools, and families), he found that consultants perceived their role as fundamentally being about building relationships with the teams that they were working with and supporting them in their teaching and learning roles. I would argue that the teachers in my study noted a different role, that of support with leadership. However, Cameron (2010) noted, that this contrasted with the expectation of the commissioning authority who expected the primary role of the consultants to 'apply pressure and support towards the implementation' (Cameron, 2010, p. 357) of the strategy. The consultants perceived this only as part of their role. This appears to be supported in my study, where teachers often perceive working with someone commissioned to support the change process as being a positive experience.

Teachers describe how the responsibility is then 'shared' and how the expert 'helps' the teachers in their goals.

In describing one consultant a teacher said:

> *'Oh yes (names consultant). She was amazing. We should get her in again actually. I learnt lots. We all did'.*

The teacher names the consultant in a personal way, and this was often the case when teachers spoke about an expert brought into the school to 'help' them with their work (to improve). The experts are often described using their name or their area of expertise with a familiarity of tone and understanding of their role in the school. They often work with the school for a longer period, building relationships and collaborating with a range of staff. The consultant, described in the following quote, worked with the staff for longer than a year.

> *'We had a brilliant maths consultant that was recommended by another school. She helped us with maths, and it really helped. We got new ideas and for those of us who don't like maths, she helped us. Helped us with our subject knowledge'.*

This appears to support the findings of Cameron (2010) who found that consultants commissioned to implement the Primary Secondary strategy, developed relationships with the teams they worked with for mutually beneficial reasons; the consultant was not viewed as a threat in exchange for supporting the challenges staff face by providing resources and information. Allen, Evans and White (2021) would consider that this is due to the feelings of uncertainty at the point of when an improvement is perceived to be necessary. They argue that when someone is commissioned to work with a school at this point of uncertainty, the perception is that they are experts because they can describe a challenging situation in a way that suggests an informed action.

Phillips and Hamann (2021) question the authority of experts brought in to support national initiatives. They were studying American schools and cite the work of Ball (2009) and who describe this process as, outsourcing expertise, to deliver policy and implementation of curriculum and assessment initiatives. Philips and Hamann (2021) are critical of using expertise to bring about reform, in a similar way to Datnow, *et al.* (2005) who also identify that experts brought into schools use the same process of reform in differing schools, and this can have limited impact. This

view is supported by Guskey (1995) who argues that successful strategies for reform in one school will not necessarily translate into another school in a different context. In Philips and Hamann's (2021) ethnographical study of a single school reform, they criticised the leaders for not questioning either the expertise of the expert, or the decision to involve the expert in the improvement process. In my study it does not appear that teachers question the experts that support them nor that they are a threat to individuals. However, it appears that experts can 'threaten' the status quo, or disturb the equilibrium, when there is an impact on a group of individuals.

6.4.3 External experts – identifying areas for improvement

While the teachers perceive some experts as being part of their team, there are also a group of experts who are perceived to be more distant from the improvement, usually offering advice to the headteacher and then not being involved in the implementation. These are the third subcategory identified in the theme, Experts, and creates the subcategory External experts – identifying areas for improvement.

In comparison to the group of experts already described, these experts are described in a more distant way. Instead of using their name or role, one teacher described them as:

> *'People who come in with the Headteacher. He will tell us they are coming in'.*

Another teacher needed to clarify their role:

> *'Err our, erm, school development person that comes in. School improvement, that's it (laughs)'.*

There is a perceived lack of clarity around the role of these experts. Teachers acknowledge that they impact on the change in a school and that they are involved in the emergence of improvement. There is less clarity on the impact of these experts on the implementation of the improvement and how they impact on their pedagogy. When asked about what happened because of the expert visiting school, a teacher stated:

> *'I know that we had some training on reading, after a visit. I'm not sure why – it wasn't me. Key stage one I think and maybe some TAs'.*

This demonstrates a lack of clarity about the impact of the expert and what was implemented. This view was also evident when discussing a previous Ofsted

inspection. When asked about what changed because of the inspection, they answered:

> '*The staff got a lot of training. Some staff left the school. I stayed*'

This appeared to be a short, unspecific answer that contrasted to those when the teachers were discussing the other group of external experts. However, when asked again about the impact of the visit, they were able to give a response that suggests a significant impact, but again without any real specifics or depth to the answer:

> '*Everything was impacted. Teaching and learning impacted on everything. Behaviour, leadership, staffing, parents*'.

Rather than providing the internal capacity that Ainscow and Southworth (1996) describe consultants as offering, this appears to fit with the description offered by Saxl, Miles and Lieberman (1989), of consultants being agents of change.

6.5 Key theme: Training

Muijs *et al.* (2004) recognised how school improvement research has identified how schools who invest in professional development (offering staff development opportunities to include theoretical understanding with practical information and feedback), are those that are investing in improvement strategy. Teachers in the interviews also identified the importance of training and staff development and this has been highlighted in the key theme, Training. This theme, Training, encompasses any formal training offered to the teachers. This might include, in service training days (sometimes called teacher training days), opportunities for career professional development (CPD) or a training course that the teachers took part in. It does not include professional discussions between colleagues, as these have been addressed within the Hierarchy and Expert themes already discussed. The type of training considered in this part of the chapter is highlighted by Henderson (1978) as activities that are structured to support the improvement in performance. This is supplemented by Ramatlapana (2009) who argues that training can be considered as something that connects the teacher with the newest and emerging knowledge in a field. An example, from the transcripts, is the phonics training staff received to implement a new phonics scheme.

In this part of the chapter, the Training theme is separated into two subcategories. I will consider the two subcategories; how training is allocated and the perceived impact of training on school improvement.

6.5.1 Training resulting from hierarchical decisions

The first of these Training subcategories is where professional development is instigated by someone at the top of the hierarchical structure. Often this is the headteacher, but it can also be a subject leader. Botello and Glasman (1999) recognise that very often the training provided is 'shaped by the school principal' (Botello *et al.*, 1999, p. 14). They denote that headteachers, or principals, devote large periods of time to providing the training and therefore they conclude that the principals must consider training valuable in the improvement process. When discussing the training that occurs as part of the school improvement process, one teacher said:

> *'Anything the Head wants to happen or maybe SLT. Usually something related to Ofsted or another visitor to the school. The local authority visitors…. That takes priority and gets money or time given to it'.*

Headteachers also impact on what other training is offered, with one participant noting that the professional development she was offered always came from the headteacher:

> *'The Headteacher emails us with possible training. I could go and ask if there was something I wanted to do, but often the Head decides. Sometimes this might be because it's something the school needs, or for some, something that they need, that they need to do in their classroom. Sometimes the Head will send us on a course that they have heard was good from someone else. Like the NPQML (National professional qualification for middle leaders) training'.*

Here it is clear that the headteacher has ultimate control over the training that teachers do, but that there is opportunity for negotiation.

Botello *et al.* (1999) also recognise that there is some training planned and presented by the teachers themselves. That is, that they provide the development opportunity in an area of improvement. Loxley *et al.* (2007) would support this approach, suggesting that the top-down approach to teacher development is not productive,

Teachers in my study describe how they take instruction from training they do outside of the school and then disseminate this to the staff. They do not offer their perception as to what the impact of this is on their colleagues or their own practise.

> *'They might go on courses and bring information back that we have to do. That sort of thing'.*

This teacher is explaining how the rationale for the training is not shared however there is an expectation for professionals to change their practise based on the information disseminated on the training. The impact of this training is not shared by this teacher however in other examples teachers were able to suggest how their professional development changed the school or their classroom practise.

6.5.2 The impact of training on the school and classroom

Teachers also discuss training by reflecting on the impact it has had. This is the second subcategory identified for discussion within the training theme. The teachers support the view of Botello *et al.* (1999) who found that in their study, the teachers work hard to implement the training in their classrooms and that often training is an effective way to bring about change and improvement.

The teachers in my study support that view that training does impact on the classroom:

> *'There was lots of training. Support for staff. I was thinking about this. Why did I mention the maths? I think because we saw such a change'.*

It is also seen to improve aspects of the school:

> *'(We) do training and stuff. We had an academy chain come in and work with us all. That was to improve things'.*

This contrasts with the work of Karagiorgi and Charalambous (2006) who found that teachers in their study in Cyprus perceive limited impact of in-service training on their practise in the classroom. Teachers from Cyprus argue that the training is not aligned closely enough with classroom practises. This view is supported by Ramatlapana (2009) who obtained the perceptions of mathematics and science teachers in Botswana. These teachers found that they could not implement the strategies learnt, due in part, to the teachers feeling that they did not have the necessary skills. These studies were carried out in other countries and more than 10

years ago, therefore I would suggest do not reflect the current perceptions of teachers in my study. In addition, it may indicate that training arranged because of a school improvement strategy is relevant to current classroom practises. This appears to be support by Vu, Han, and Buell (2015) who considered the impact of training in the classroom. They noted that practitioners did respond to the training and that it impacted on their behaviours in the classroom.

This is suggested as being the case in the strategies that the teachers received training for in school improvement: One teacher described how, after whole school training on mathematics, the whole school did:

> *'Multiplication every day, (and) choral counting'*

Another describes, how after training on oracy, they detailed on their planning the vocabulary they were going to teach. This was seen to give vocabulary a focus in the classroom every day. Another teacher described how training from the physical education coach helped her with new ideas for use in her physical education lessons. All these examples determine that teachers perceive the training they receive as improving their practise in the classroom.

6.6 Key theme: Clarity

The theme of Clarity describes discussions within the interviews where teachers perceived a lack of transparency, coherence, or certainty. Where the theme was identified, teachers described a lack of coherence about a strategy, or it was when teachers demonstrated a lack of certainty through not being able to answer questions on an aspect of improvement. It was also evident when teachers' were unable to name or identify aspects of the improvement journey. An example of where teachers felt there was a lack of coherence is when a teacher described her lack of understanding as to why artists had been commissioned to work with her school. An example of where a teacher was uncertain about part of a strategy was when a teacher described an initiative she had, until that moment, forgotten about. She reflected on the training the staff had had on an initiative called 'philosophy for children' but was unclear about the expectations surrounding the use of this programme now.

Teachers both describe and demonstrate a lack of clarity in different aspects of the school improvement journey. This is demonstrated through the answers to questions on the initial starting points of school improvement strategies and therefore the reasons for change.   Teachers describe this part of school improvement as sometimes being like a 'guessing game' where they do not always know what will come next. While there was a lack of clarity around the initial starting points of a strategy, there were also vague responses when discussing the impact on pupils of implemented initiatives.

In this part of the chapter, I will provide examples and a discussion on these points within the theme of Clarity and consider previous literature where it is pertinent to the discussion.

6.6.1 Starting points

A school improvement strategy is introduced in a variety of ways and for several reasons. The point at which the improvement strategy is decided upon and begins, describes the subcategory Starting Points and is considered part of the clarity theme.

Teachers discuss how a strategy is introduced but were often less clear about why it was initiated. This is reflected in the discussions about school improvement by Allen, Evans and White (2021) who also recognise that teachers can describe what they are doing as an improvement strategy but not always answer questions about why they are doing it. Louis and Miles (1990) also identified that teachers are required to tolerate ambiguity as part of school improvement. In my study one teacher discussed the use of attainment data as a possible reason for change within the school, demonstrating that this ambiguity is potentially something teachers are still experiencing:

> *'Our data had got better but I'm not sure that is why. No, I don't think so. I don't know'.*

The teacher is aware that often school data may be used to identify areas for improvement, so she begins by making the presumption that the data is the reason for the focus on mathematics in her school. However, she remembers that the attainment data had improved and would therefore possibly not be a reason for a maths initiative to be implemented. Another teacher recognises that an outside

expert had been commissioned to work with the school and that this was because it was on the school's development plan. The teacher does not appear to understand why there is a need for development in this area of the school.

> *'She came in and did some training. I'm not sure why but I think because it was on our school improvement plan. We then had some things to go and do……Then she came back, and we did more training. I think that was for school improvement'.*

The use of the words 'I think', demonstrates this lack of clarity about why an area of the school needed improvement. After careful consideration, a possible reason for this could be, not that the clarification was not given at the start of the strategy, but that teachers may not be remembering the reasons. This is echoed in another teacher's interview.

> *'I knew that SLT (senior leadership team) were concerned about reading across the school. I can't remember why it came up, but we had been talking about It'.*

Despite the reason for the lack of clarification, there is no doubt that this caused frustration for the teachers I interviewed. One teacher described a lack of rationale for the change. She therefore then perceived the changes to happen quickly and without due thought and consideration. Teachers perceive that understanding why something was changing was important as that was how colleagues would agree to implement something new.

> *'I think I mentioned this before. People need to understand why. Buy in, sort of thing. They need to know the point even if they don't like it. Like their teaching isn't good enough or the children can't do something they should. As long as people know. Most teachers want to do the right thing…It's just honesty. Being honest'.*

It is suggested here that sometimes the lack of clarification around the reason for change causes a lack of trust. The teacher needs honesty and feels this would be the way to encourage teachers to make the change. Ramatlapana's (2009) findings support this view, with teachers in her study stating that without ownership over their own development, their belief systems would not be changed. Teachers explained that in- service training (training received and provided in the school) would then have limited impact. This uncertainty around the reasons for strategies also makes staff feel that they do not know what is coming next, increasing the feelings of uncertainty.

'It (school improvement) shouldn't be used to trick people or make them look like they are not doing their job. People just want to know what they should be doing and 9/10 times they will do it. It shouldn't be a guessing game'.

When I asked another teacher about the impact of the unpredictability (because of not understanding the starting point or why something needs to change) they perceived this to have a negative impact on their colleagues.

'Yes, because people spend time and effort doing it. Most people want to do a good job. No point in doing it if you don't know why'.

Ramatlapana (2009) suggests that by including teachers in the design of their training they will be more motivated to engage with the process. This view is supported by Louis and Miles (1990) who found that where the vision for change was shared leadership was more successful. While I understand the importance of engaging teachers in the training and the reasons or vision behind it, it is also important to understand that teachers do not always have the bigger picture or understanding of the needs of the whole school. I would propose that this should be more collaborative, with senior leaders (who are likely to understand the wider needs and implications) being closely involved. Therefore, those with more power do need to be involved in the direction of school improvement.

The lack of clarification or memory on why school improvement strategies have been initiated could also have influenced the teacher's inability to identify a strategy's impact on pupils.

6.6.2 Impact on pupils

Any school improvement impact on pupils was considered as part of this subcategory. This included impact on educational outcomes, impact on social and emotional wellbeing and impact on inclusion in schools. Where something changed the behaviour or outcomes for the pupils, it was included for discussion within this subcategory.

Teachers were able to discuss, with some detail, how the strategies developed within their schools. This often included some detail around the order in which improvement was implemented. They could discuss the training they or others completed, the people they worked with, and often the impact on their own teaching and classrooms. However, even when asked directly, they were unable to articulate

what impact the strategies had on pupils, except some 'softer' impacts around inclusion in the classroom.

> *'I think the impact was on staff, the training, and the resource ideas. On the pupils, some support for them in class…. (The staff learnt) that they shouldn't be doing things for the children but that they should be more independent. We found ways to help the children in class. The training talked about how these methods help all children. We found that changing the colour of the paper across the school – some adults found it easier to read. I did. Some children preferred it, gave them an incentive to work more, some it 'fixed' the writing moving on the page'.*

While the teacher did not clarify the reason for the training described, this extract demonstrates how this strategy, that included training for the staff, impacted on staff's belief systems around how they support pupils in class. It also was perceived to impact on staff's ability to read text at work and impact on incentivising pupils. However, there is only a brief mention of the impact on pupils reading at the end of the discussion and no suggestion as to whether, when the writing became fixed to the page, there was an impact on pupils (although we can presume that it did). This is supported in another interview, where the teacher said that school improvement does impact on pupils, but it impacts on the staff more. There does not appear to be any follow up and measurement around the impact that the training had on pupils. Or, if there was, this was not made clear to the teachers in these examples.

The analysis demonstrated that this was typical of how teachers viewed the impact on pupils. An initiative to improve the behaviour of pupils and the processes that were put in place were discussed at length. This included, the movement of classrooms, groups and employing a school counsellor. While these processes were viewed positively, the only impact on the pupils that was described was:

> *'The children were more settled without the pressure of doing maths and getting work finished'.*

While children being settled in school is clearly vital, the questions around what the impact of them being settled was, do not appear to have been asked, or answered.

6.7 Key theme: 'Dissipate'

The theme, Dissipate, links directly to the *in-vivo* code (Charmaz, 2006) 'fizzle out' used by one of the teachers to describe how school improvement ideas, strategies and initiatives often appear to disappear. They 'fizzle out' rather than come to a

satisfactory conclusion. Within this theme, teachers discussed the opportunities they had to revisit school improvement and the legacy that the strategies left in their schools.

6.7.1 Opportunities to revisit

This subcategory recognises when the activities associated with school improvement are repeated or considered after the original implementation has taken place.

Teachers perceive some school improvement initiatives as successful. Those that were considered successful strategies are remembered positively and there was often a moment of reflection about how it would be useful to revisit these strategies again.

Ramatlapana (2009) identifies the importance of including activities that follow up from previous training to sustain any improvements. It is suggested that this will provide opportunities for teachers to master the new skills they have been taught. The teachers in my study also describe how there would be a benefit in revisiting strategies. This would have the benefit to both develop new staff and remind staff of previous successes.

> *'(Working with) the consultant finished but we still use some of the planning and ideas. Although, some of the staff have left now. Kind of finished but I guess we still do a lot of what we did back then. It would be good to do it again. For new staff. Also, a reminder for the rest of us…Yes, it is important to come back to things. Like I said. To remind people. That isn't done enough'.*

With an absence of opportunities to revisit, there is also a confusion as to what the current expectations are.

> *'Sometimes things get forgotten or …erm…fizzle out. You know we start something and then never hear any more. It is forgotten 'till someone remembers and then we are like 'what happened to that – do we still need to do that or not?' Not everyone is there from when we did it. The people who were trained will still benefit'.*

It is evident, that having the opportunity to revisit previous learning, is perceived to be an activity that teachers value.

6.7.2 Legacy

The Legacy subcategory refers to the lasting impact of a strategy or school improvement action. The subcategory documents how teachers described the lasting outcomes and impact of a previously implemented strategy, on current practise.

Often it was difficult for teachers to identify what the legacy of a previous area of improvement was. When describing an art project that involved commissioning artists to work with pupils and staff, the art leader was asked whether there was a lasting outcome from the initiative. She answered:

> *'No, only the art'*

This referenced an art installation that had been created as part of the project. This raises questions about whether there was no lasting impact on pupils or staff, which seems unlikely given the quality of the experience described, or whether these questions had not been reflected on after the project had ended. Opfer and Peddar (2011) note in their study that schools who are the lowest performing participate in initiatives that are 'short in duration' (Opfer and Peddar, 2011, p. 21). This could indicate that the teachers in my study were not given the opportunity to consider what the lasting impact was and how this impact could be extended over time.

The speed with which initiatives are forgotten are also recognised by the teachers in my study and considered in a negative way. This might be, as Mortimore (1998) suggests, that true school improvement is a slow process, and the teachers recognise the need for strategies to mature and embed in daily practise. Teachers who worked together on a project, will sometimes remember a strategy that has come before. However, the teachers studied, perceive that priorities change, and initiatives are quickly moved on from.

> *'Usually something has to change because of a new policy or local initiative. It usually always ends up being forgotten about. No end to it but one day we remember it and it has all been forgotten… So often things happen quickly without a rationale. Then forgotten just as quickly. That makes school a toxic place to work. Sometimes'.*

There is, however, an understanding and acceptance among the teachers about this fast-paced response to improvement. While they perceive change to often happen

quickly, they recognise that this is due to external factors, such as funding and changing priorities.

> *'It is great to work with other schools and see what they did. I think we should have carried on…It's a shame some of the newer teachers weren't here for that…. Nothing gets carried on. Does it? People move on, priorities change. Also, the money runs out. That too'.*

Here the teacher recognises the potential for the strategy to have had a legacy. However, the strategy is quickly forgotten, and this results in newer staff members being unaware or unchanged by the strategy that was implemented.

6.8 Key theme: Trends

The key theme of Trends is used to describe the school improvement strategies that appear to develop due to something that is in fashion or in vogue at the time. These strategies are described as being, of a particular time and place. They are discussed as being introduced into the school because of two different starting points, social media, and the education community.

6.8.1 Social-media

The first of the subcategories within the Trend theme are where teachers can identify strategies implemented into school because of a trend that has appeared on a social media platform. These were identified when teachers named a social platform or alluded to the idea that an improvement strategy originated from something seen on one of these platforms. These included Twitter and Facebook. It does not include the references to social media used to promote initiatives at their own school that originated from another source.

Teachers perceive Trends as both impacting positively on schools and in a more negative way. They are described as being short-lived or only used by a few individuals. In this example, the teacher describes how the school adopted creating and using knowledge organisers for each of the curriculum subjects. Here the teacher describes how the initiative began.

> *'I think it was something someone had on their phone. I think it was on Twitter. (They) talked to a friend, an ex-colleague that we know, and she had done them at her school. We looked at some examples and thought we could*

do them for our year group. We got a format from (names online platform) and all worked from that……Great to do something off our own backs. That we wanted and that we knew would help the children…. Help us with our work and with the children in the class'.

Other teachers were less positive in their response to the initiatives taken from social media. This teacher is describing how the school adopted a new writing scheme based on something the English lead had seen advertised on Facebook.

'It was something she had seen on Facebook, that someone she follows had been using at their school. Then we are doing it (laughs). You can get very blasé about it. When you have been doing it as long as I have'.

This suggests that more experienced staff, perceive that they have seen the trends appear and disappear over their career. There is a perception that the only reason the initiative was introduced, was because it had appeared on Facebook. The teacher perceives there to have been little consideration or rationale behind the decision. Potentially, this is another reference to a theme previously discussed, Clarity. There is no clarity around why the strategy has been implemented, so the teacher is left to conclude that it is only introduced because of it being a fashionable trend.

6.8.2 Educational community

In the analysis, trends within education that are identified as being fashionable at a particular point in time, are discussed by teachers. These trends are introduced by the educational community, sometimes in the form of training, or are introduced after the successes seen at another school. This is the second subcategory in the Trend theme.

All the teachers discussed these trends as being problematic and time consuming. They are not discussed with any evidence of impact on the school, staff, or pupils. One teacher demonstrates her concern about the educational trends that she has seen in her career.

'It takes money and time and that is more money to give people the time. Schools just don't have it. That's why things finish or get forgotten. The direction changes. Things are trendy. Like brain gym. Do you remember that? No one does that now. We trained loads on that'.

The idea that these developments are quickly forgotten is also noticed in the analysis. When considering educational trends, teachers do not reflect on whether there should be an opportunity to revisit the strategy or train new staff on the initiatives. When discussing what prompted change in a school, a teacher remembered the use of the initiative, philosophy for children.

> *'We did P4C (philosophy for children) a while back. I've not heard much more about that on courses now. That was the thing to do for a while in education. Not anymore'.*

The educational trends are not always confined to activities or programmes from external companies but also from respected official bodies within the educational sector: a possible recognition of the constantly shifting landscape of education. This is the case when teachers discussed Ofsted and the training involved each time there is a new inspection framework. One teacher used the word 'buzz words' to describe the latest terminology used by Ofsted. This suggests that these improvement expectations are also seen as trends, as the phrase 'buzz words' means, of a particular place and time. The teacher explains how these 'buzz words' need to be implemented and used in schools.

> *'They (School Improvement Partner) do the Ofsted training and tell us what the focus is. What's the buzz words? Then we know to get prepared'.*

Trends do not appear to be confined to strategies that can afford to be ignored or chosen, but also by authoritative bodies, such as Ofsted, that hold power within schools' improvement hierarchy. This is discussed by Allen, Evans and White (2021) who describe these trends as 'the next big thing' (Allen, Evans and White, 2021, p.10) suggesting the idea that there are strategies that dominate and then are replaced. They conclude that leaders implement these into the building blocks of their schools as they believe them to be 'solid stone, where in fact they are ice-bricks that will melt away in time' (Allen, Evans and White, 2021, p. 141). This appears to be supported by the teachers, who recognise that the focus on trends will likely dwindle over time, when initially they had been introduced as a way of making improvements.

6.9 Key Theme: Relationships

The theme of Relationship permeates every interview and every school improvement strategy discussed and describes incidents where two or more colleagues are connected. The Relationship theme includes all situations where teachers have an association with each other (where school improvement is the focus of discussion). Relationships can be informal and formal, are impacted on by the time the colleagues have worked together (or known each other), and teachers' leadership responsibilities.

6.9.1 Formal and informal relationships

The formal relationships described in this subcategory can be considered any relationship that has been deliberately enforced. They are the relationships that are required of the teacher as a response to a direct expectation of the school. The informal relationships are those where colleagues create a connection themselves, not as an enforced requirement of their role within the school.

The formal relationships described by teachers are often role related. They are identifiable because of the roles teachers hold in the school. For example, a teacher may be working in a formal capacity with someone because they are the English or history leader. They are often directed to work together on a school improvement initiative, and this can lead to an informal relationship being formed later. Informal relationships appear to occur because of either a formalised opportunity to work together that then continues after the initiative, or, because of formal planning groups or teams that work together for a long period of time.

When asked how the relationships in school change because of school improvement, one teacher said:

> *'A mentor and (their) NQT. They get a better working relationship by the end of the year and sometimes that will continue. I still see an NQT, I worked with (them) years ago, somewhere else'.*

The idea that the amount of time colleagues work together not only impacts on their relationship but on school improvement, is also perceived to be important by teachers.

> *'The maths lead and the consultant. Working on things together. Days out of class. It all builds a relationship, over time……It must have made things better for the children'.*

Both formal external relationships (discussed previously in the key theme, Experts) and internal formal relationships (such as those between a head and deputy head) are identified as supportive. Throughout the transcripts, the teachers give examples of how they have supported someone because of a leadership role they held, or that someone has supported them in a similar capacity.

The English lead in a school describes that in her role she is required to work with new staff, parents, train staff, and work with the senior leadership team. This is also exemplified when a special educational needs coordinator lists the outside agencies she works with (such as educational psychology and the school nursing team) alongside all the internal staff she supports. This offers the viewpoint that this is not just about the formal relationships that they hold but also the informal relationships, as exemplified by the following extract.

> *'The success of school improvement) It's about who you get on with. It is sometimes about your leadership role, but mostly just who feels comfortable with you'.*

Teachers perceive that the strength of the relationship is impacted more by the informal connections they build than on those formal relationships that form and are required as part of a formal leadership role.

6.9.2 Leadership

The literature on leadership is vast and therefore so are the definitions. For the purposes of this subcategory within the relationships theme, the subcategory Leadership refers to occasions where teachers identify a connection between themselves and others because of their leadership role in school. These roles could include, subject leadership, headteacher or deputy, of head of a key stage (stages within the primary sector at the end of the early years, year 2 and year 6 for pupils).

As previously discussed, the leadership roles that teachers hold are important in the formal relationships that colleagues build. These leadership relationships are fundamental to the sharing of knowledge and expertise. The formal relationships identified between colleagues are directly linked to the knowledge shared in school

improvement strategies. When discussing her role as a school special educational needs coordinator, the teacher lists the knowledge she shares with her colleagues as part of her formal relationship with them.

> *'Helping teachers know what to try. Organising TAs (teaching assistants). In progress meetings with teachers. Helping with planning with staff…SENCO (special educational needs coordinator) is a huge role and I think everyone knows that. I work with everyone too, so I know everyone well. I must or things won't get done'.*

Individuals are impacted on by their formal leadership relationships and these relationships can become challenging for them. They can require teachers to need to respond formally to their colleagues, with one teacher describing the uncomfortable nature of needing to monitor and support a colleague and support to ensure improved performance.

> *'I noticed that a particular teacher known for not marking, wasn't marking his maths books. I had given him feedback, and nothing had changed. We discussed this and no one else had noticed. Oh great, only me! I had to go and check he was after my feedback and other staff had to do a scrutiny of their books. Not just his, but everyone's, for marking. It got resolved in the end. It was good as I wasn't on my own. You need everyone's' support if you can'.*

Here the teacher is showing the conflict between her teacher role and the role of leader in improvement. The teacher gains support from the team and then the process appears to feel less personal. The teacher is clearly relieved that there was a resolution, however felt uncomfortable at being the only person to notice the initial problem. This conflict between teacher and leadership roles is highlighted by Stuyve, Meredith and Gielen (2014). They found that in schools in Finland (where the expectation for teachers to lead areas in the school is increasing) teachers must negotiate the politics around leadership and the social relationships they form with their colleagues in their teacher roles. This is mirrored in the example from my study, where the teacher is conflicted about having to monitor a colleague after underperformance is noticed.

Formal leadership relationships are also described as developing later into more informal relationships.

> *'In a previous MAT we worked together a lot. I got to know the computing lead of another school and we did a lot together. We still keep in touch. We wrote a scheme of work for the MAT…. I worked with him the whole time I*

was there. We shared resources and helped each other with monitoring. It was great to have someone who could work with you. Especially in a subject like IT that not everyone likes'.

This relationship that originated from the multi-academy trust required the two computing leads to work together on a scheme of work (a formal relationship) and this evolved into a less formal relationship, where the colleagues supported and helped each other with their school improvement tasks. Similarly, we can reflect on the mentor and NQT relationship already discussed in this chapter and consider how the mentor continued to see the NQT, even after they had stopped working together. Liu (2021) studied collaborative working between schools in China and found that while this supported all schools it impacted lower performing schools most significantly. As with my study, there was no explanation from the teachers (or in Liu's study's findings) about how success or performance was measured. In my study this is because it is teacher perception that is the focus of the research. However, this is not the case in Liu's (2021) study which sought to measure the impact of the collaboration. This could be considered a limitation to Liu's (2021) study.

 In addition to the formal and informal roles the teachers describe in my study, they also often describe planning teams that they work in. These groups create an informal support network within the school improvement process.

Working as part of a team is also a recognisable feature of the Relationships theme in the analysis.

6.9.3 Teams

The Teams subcategory, within the relationships theme, describes the groups of colleagues associated with one another because of an emotional connection. This differs from the teams associated in the hierarchy theme, which refers to the power dynamic of a team in the school improvement process. Relationship teams are typically informal. They occur when teachers discuss supporting each other. They are always collaborative.

The teams that teachers find themselves a part of, can range from subject teams, to planning teams, to groups of colleagues that informally support each other at work. A key feature of the 'team relationships' teachers describe is the supportive role they

play in the improvement journey. Many of the teachers describe being part of a team that sticks together or supports each other; a comradery that appears to evoke confidence in the change process. The use of teams to support initiatives and give teachers the confidence to initiate and try new ideas themselves, is clear throughout the transcripts.

In the event of a new strategy being implemented, teamwork is also seen as a way of being time and workload efficient. A teacher described how their team was trained together on a new way of teaching English. The advantages after the training were seen in the working relationship between the teacher and the teaching assistant, who was part of the team being discussed.

> *'We both knew what the other was trying to achieve. It saved us time and she didn't have to keep asking me what she should be doing. That way the children didn't get confused by us doing things differently. I think that will be the same when they went to another class. Everyone does things the same way. That's got to be better'.*

Collinson and Cook (2007) and Day and Leith (2007) recognise the importance of this coherence between colleagues when participating in school learning. Similarly, Loxley *et al*. (2007) suggest that any training should be sensitive to the relationships between teachers and their school and ensure that those receiving the training are confident that the content differs in a positive way from their current practise. Loxley *et al.* (2007) report, that in their study, there were differing numbers of colleagues attending training depending on the size of the school they worked in. In the previous quotation from my transcripts, the teacher noted the positive impact of the whole team being trained on the same initiative, at the same time. However, Loxley *et al*. (2007) did not consider whether the differing size groups attending the training had an impact on the implementation and impact of the strategy.

6.9.4 Other stakeholder relationships - parents and school governors
The relationships between teachers and parents of pupils, and between teachers (in their leadership roles) and school governors, was also noted in the interview transcripts.

Teachers reported that the relationships between teacher/school and parents either improved, or developed, because of some improvement strategies. This was not

always the case but did occur in some instances. This is supported in the literature review completed by Muijs *et al.* (2004) who recognised that there are many studies that conclude that there is a relationship between parental engagement and school improvement (Joyce *et al.,* 1999, Barth *et al.,* 1999, and Borman *et al.,* 2000).

Similarly, the relationship between teachers and school governors were considered, by the teachers in my study, to develop because of teachers, as leaders, reporting to school governors about school improvement strategies.

Identifying the relationships of other stakeholders is important, not because they appeared to impact on the school improvement strategy itself, but as an outcome of the initiatives implemented.

6.10 Summary of the seven themes

To summarise, in the interviews, there were seven themes identified as being significant in teachers' perceptions of school improvement. Within each of these themes, the teachers reflected upon the impact of school improvement on those associated with the school (parents, governors, their colleagues), themselves, and to a lesser extent, on the pupils. How school improvement impacts on those stakeholders and how the stakeholders impact on school improvement was therefore a point for discussion in the focus group (discussed in chapter 7). I suggest that this is important because, from my experience, the impact of stakeholders on improvement is not reflected upon when schools record their school improvement. Similarly, through the analysis of the themes, it is evident that there are several conflicts or tensions evident. These are identified within the subcategories of 'external experts' (tension between those perceived to make judgements on the required change and teachers), 'individuals' (between leadership roles and teacher role and between those higher in the hierarchy and the recognised needs of the teachers) and 'training' (tensions between what is chosen as a training need and what is perceived to be the need by teachers). Tensions are also evident within the Clarity and Dissipate themes, as both a lack of clarity and awareness of how new strategies appear to disappear. This appears to cause frustration for teachers. Consideration of tensions surrounding school improvement was also therefore important in the focus groups conversations.

The six themes identified were, Hierarchy, Experts, Training, Clarity, Dissipate and Trends. These themes will now be considered in relation to Complexity Theory characteristics.

6.11 How do the key themes relate to the characteristics of Complexity?

In this part of the chapter, the key themes are discussed in relation to the Complexity characteristics they could be aligned to. In cases where the findings could be aligned to more than one Complexity characteristic, this is noted, and an explanation is presented. The findings are discussed in relation to the aim and objectives pertinent to this part of the chapter.   I will also consider why the key theme of Training does not appear to directly link to a Complexity characteristic. To conclude, the chapter will consider the characteristics of Complexity that are not aligned to a key theme identified in the analysis which is also significant. I will then consider whether this demonstrates why Complexity should be considered for use in school improvement research.

The key themes of Hierarchy, Experts, Training, Clarity, Dissipate and Trends are perceived by teachers to be important aspects to consider when discussing school improvement. These themes directly link to the Complexity characteristics of agents and interdependencies. emergence, temporality, equilibrium, bifurcation point, self-organisation, loose coupling, and connectivity. This is illustrated in Table 7 below.

Themes	Complexity characteristic

Hierarchy – Authoritative bodies
 	
        Individuals
 	
        Teams
	Equilibrium and bifurcation point
	
	Self-organisation
	
	Bifurcation point

Experts – experts within schools
 	
    external experts that support identified improvement
 	
    external experts identifying areas for improvement
	Agents and interdependencies
	
	Bifurcation point

Training – hierarchical decisions the impact of training on the school and classroom	
Clarity – Starting points Impact on pupils	Unpredictability
Dissipate – Opportunities to revisit Legacy	Temporality
Trends – social media educational community	Temporality

Relationships – formal and informal
 	
      leadership
 	
      teams
 	
      other stakeholders
	Agents and interdependencies
	
	Connectivity, loose coupling, and self-organisation
	
	Bifurcation point

Table 7: How the Complexity characteristics can be identified within the key themes.

The reasons for why a relationship can be identified between the key themes and Complexity characteristics is now discussed.

The characteristic of equilibrium describes the 'status quo' in a system or organisation. It is a moment where there is no change (in schools this may only be within a particular area of the school, or subject, or staffing structure). There is a balance and norm within the system. As systems change, the equilibrium is challenged. Examples of this are described by teachers, as after an Ofsted inspection or a visit from a school improvement advisor.

The theme of Hierarchy is always identified in the analysis where the equilibrium is challenged, and change begins to emerge. All school improvement strategies or

initiatives are supported or led by an agent that has power within the school system. It is always the case that someone within the hierarchy will be involved in the strategy, disrupting the equilibrium. An example of where this is described by teachers, was when the headteacher completed a subject review and then requested change to improve the areas that she noticed in her review. The headteacher is perceived by teachers as someone who has power in the hierarchy and someone who may disturb the equilibrium.

The theme of Hierarchy could also be aligned to the Complexity characteristic of bifurcation point. The bifurcation point is the moment in which the equilibrium is challenged. Often, those in power, at the top of the hierarchy (for example, Ofsted, headteachers and multi-academy trusts) create the bifurcation point. However, where some teachers recognised that often those in power can create a change (a bifurcation point), they do not always. When asked about who has the power to make a change in a school, one participant noted:

> *'Maybe all of us together. If we work together, work as a team'.*

This demonstrates that the change can come from those with less power and therefore power and hierarchy are not always the bifurcation point (the cause for change) but are always present while the equilibrium is challenged (as were, in this teacher quotation, the 'team').

Complexity Theory describes agents and interdependencies as parts within a system. They are sometimes also described as subjects. In the case of a school system, the agents and their independencies are the school stakeholders. Throughout the descriptions of school improvement, teachers discuss the people they work with and the relationships they have with them. Therefore, agents and interdependencies are viewed throughout the narrative. This was also a question set that was returned to more than others, demonstrating the importance of this Complexity characteristic. This is illustrated in Figure 13 below, where the darker the

grey/black colouring, the more often the question set was used within the phases.

Self-organisation

The Whole

Unpredictability

Spontaneity

Agents and
Interdependencies

Connectivity

Complexity
Reduction

Challenging equilibrium

Emergence
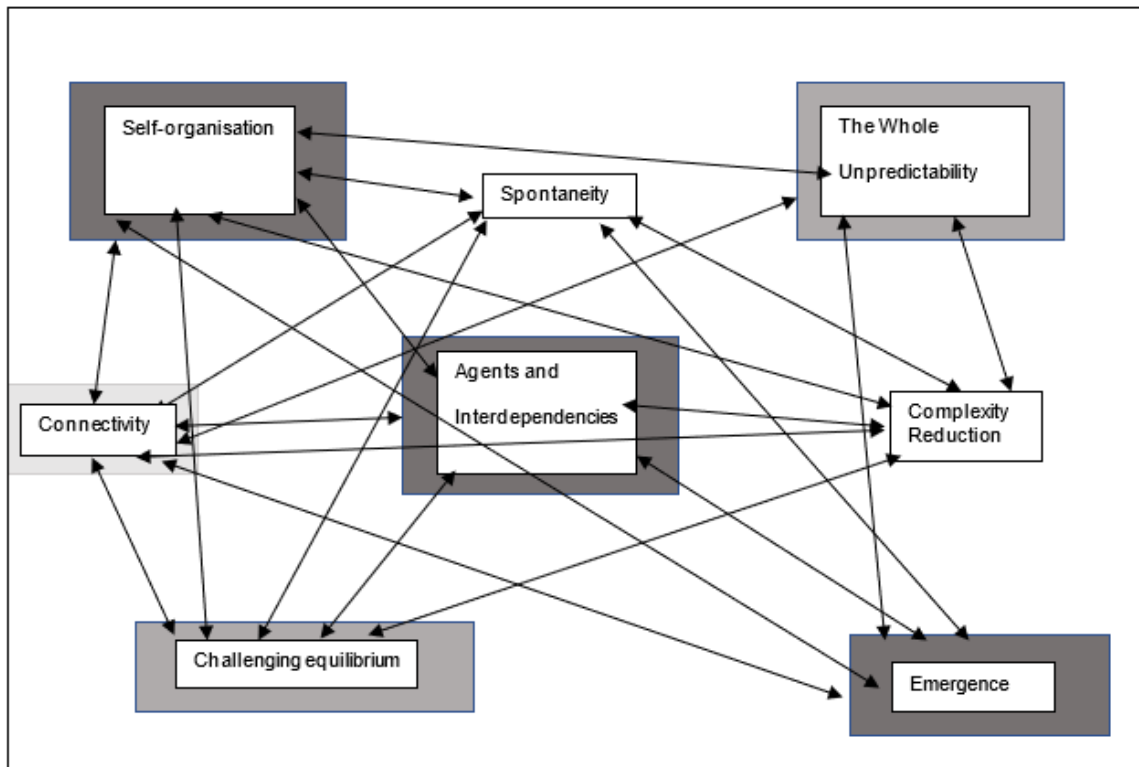
Figure 13: Heat map to show the prominence of use of the question sets with the darker characteristics being the most prevalent.

In addition to the agents and interdependencies question sets being the darkest colour, therefore highlighted as being used most often in the data collection, so was the self-organisation category. Both suggest that the key theme of Relationships is of importance to teachers, as they describe how teachers self-organise themselves (through relationships they had with each other).

The key theme of Hierarchy identifies the agents in the school system, however, also conflicts significantly with the theory surrounding Complexity. In Complexity Theory, the system self-organises because of a challenge to the equilibrium. Within the key themes, teachers discuss how the hierarchy impacts on the direction and process of the change within the school system. There is clear evidence of both those in positions of power and external experts both initiating change (being the bifurcation point) and controlling the emergence, of at least some of, the system change. The theory that there is no leader in a Complex system contradicts directly with how the teachers perceive school improvement.

Temporality recognises the emergence of change in a system over time. The themes 'trends' and 'dissipate' describe how temporality is important in school improvement. Teachers discussed how some school improvement initiatives are of a certain place and time. These are identified in the coding as 'buzz words' and have been translated into the theme Trends. Temporality is therefore important in this aspect of the school improvement journey as it describes how some strategies are related to the period that they are introduced. This theme could also be aligned with the characteristic of 'starting points' that Complexity recognises. The theory that all change in a system has a starting point. This could, but may not be, the same moment as the bifurcation point.

Teachers describe the temporality and emergence of strategies that are introduced into the system. They can describe, in detail, the activities that happen over time and the order in which they occur. However, some school improvement strategies are described as not ending, or not appearing to have an end point; they Dissipate. Again, this can be described using the characteristic of temporality. The time that a strategy begins, takes place and ends, is significant to how the teachers perceive school improvement.

Figure 13 above, shows how the emergence of school improvement was a question set that was used often in the data collection (illustrated with the use of darker colouring on this characteristic on the heat map). This was because it was emerging as an important aspect to the discussion throughout the phases of interviews. This indicates, that with the greater use of the question sets, agents, self-organisation, and emergence, it could be suggested that the key themes of Relationships, Trends and Dissipate are perceived to be significant by teachers.

Complexity recognises that systems are unpredictable and the change that occurs in a system, is also unpredictable. The key theme of Clarity could be described using the characteristic of unpredictability.

Teachers describe how there is a lack of clarity around the reasons for some school improvement. There is also a lack of clarity in the descriptions of the impact of some strategies. This creates an unpredictability for the teachers, they are unsure as to the direction of travel of the strategy, as it is unpredictable. In fact, one teacher described not knowing why something has happened as 'unnerving and

unpredictable'. It also caused one teacher to describe some improvement as like a guessing game, and another describes how, with her knowledge of being on the senior leadership team, she can remove the unpredictability from the process. The teacher was aware, from her place on the senior leadership team, that reading would be something that leadership would be focusing on next.

> *'I was able to give staff the heads up before anything else happened. I knew to ensure that all the reading books were changed, that the children were reading the right books. That the TAs knew what they were doing. We were prepared. You know'.*

This unpredictability caused because of a lack of clarity, results in teachers feeling like they are guessing what will happen next in the school improvement journey.

The characteristics of connectivity, loose coupling and self-organisation are all described when teachers discuss the theme of Relationships. Complexity Theory describes how agents connect with each other as Connectivity. Where this is connectivity is independent of any formal instruction agents self-organise. How connected agents are to each other, could be described by Complexity as loose coupling. Teachers in the study consider how they connect with each other formally and informally. The teachers also connect with other stakeholders, such as parents and school governors. Sometimes, these couplings are loose. For example, teachers describe how they may visit another school for school improvement purposes for a short time (usually for a specific task). These relationships are not revisited, and the teachers therefore become loosely coupled.

One teacher noted, in a description of working with colleagues from other schools:

> *'We haven't met this year but before we would get together and (says name) would say what we're going to do'.*

This shows how connectivity is important in the relationships that colleagues have when enabling change and improving schools. Teachers also self-organise within their informal relationships. They support each other in their planning teams, with other aspects of school improvement. They also self-organise from more formal relationships (such as mentor and newly qualified teacher) to one of colleagues supporting each other with their classroom responsibilities, a more informal relationship.

The external experts, that teachers describe as impacting on the future strategy for school improvement (such as Ofsted and the Department for Education) can be considered as being the point at which the equilibrium is challenged, and change is initiated. This group of experts are therefore the bifurcation point for schools. Teachers also described the parents as impacting on how the school evolves, with one explaining how complaints from parents about behaviour, initiated a change in classrooms, staffing, and approach to learning for some pupils.

> '*The parents were all complaining, to the teachers, anyone who would listen. We changed the behaviour policy because of the parents*'.

In this example, the parents are perceived by teachers to be the bifurcation point in this strategy. The bifurcation point is called the tipping point by Murphy (2013) who subdivided these points of educational change into the social, political, and economic. While the teachers have not directly drawn this link to the point of when change occurred, the power and experts' theme has connections with social and political change.

In Figure 13, it is evident that the characteristic of challenging equilibrium was identified for questioning more than three of the other grouped characteristics (spontaneity, complexity reduction and connectivity). I would propose that this indicates how teachers perceive that there is an equilibrium and that it can be challenged. Due to this analysis, the Complexity characteristic of equilibrium is identified in the key themes as prevalent and is therefore also identified as a tension category in the final findings of this study. This is discussed further in chapter 8.

It was more challenging to link the Training theme with a Complexity characteristic. This could be in part due to training being an action rather than a concept. The theoretical concepts of Complexity Theory do not dictate specific activities but rather describes systems and how they evolve. Therefore, it could be argued that, the activity or action of training is not suitable for aligning with a theoretical concept. However, on closer analysis of the training theme, aspects of the characteristics can be seen. In some training activities that the teachers discussed, there was evidence of self-organisation. This was where teachers disseminated their own knowledge and skills to support their colleagues, rather than as a specific requirement of a school improvement strategy.

> *'I had learnt about ADHD on a training course years ago and I thought it would help. I still had the PowerPoint slides, so I shared them. I think it helped that teacher with her behaviour management strategies'.*

Other types of training could be considered a feedback loop, where a system goes back and revisits previous states of equilibrium. This was where teachers described training as a repetition or a reminder of instruction the teachers had completed or received before.

Different types of training offered different opportunities for teachers to create loose couplings with colleagues. Loose couplings are described in Complexity as parts of the system that are loosely joined. In some cases, these loose couplings formed a closer connectivity in the future. One teacher describes meeting a colleague on a training course and working more closely with her on school improvement strategies in the following years. The theory also describes connectivity, where parts of the system connect to each other to support the system or evoke a change. The training described here has evidence of these characteristics. Therefore, the theme of training is not represented fully by any one characteristic of Complexity, but instead, appears to require a range of characteristics to support the description of different types of training discussed by teachers.

Some of the Complexity characteristics identified in the definition of Complexity used in this study (discussed in chapter 3) were not easily identified within the key themes. These are, the whole is greater than the sum of its parts, and non-linearity.

The characteristic, the whole is greater than the sum of its parts, describes how an action within a system can have more impact than the one expected. School improvement strategies were not perceived by teachers to impact on the school in differing ways to those they were intended to. This is significant, as it seems unlikely that this would be the case (as discussed in previous chapters). It was therefore important to consider why this might be. One suggestion would be that teachers and leaders are trained to recognise school improvement in a linear way. This means that leaders learn to record how changing a strategy or developing a new way of working will impact on the one area that you have targeted to improve. As previously discussed, there is little opportunity within school development plans to consider the impact that a strategy may have had on other areas of the school. Perhaps this

process of cause and effect is so deeply ingrained in how schools work, that it is difficult for teachers to view the 'whole'.

Teachers describe a linear path of improvement. They consider how something changed and how this impacted on the school. The lack of clarity around the impact on pupils of the strategies, may indicate that teachers are not given the time (due to the complexity of schools and the workload pressures), to consider this in enough depth. Potentially, if this time was given, they may be able to identify other aspects of the school that changed as a result, and therefore recognise a non-linear path of improvement. therefore, that describes how strategies appear to dissipate certainly suggests that the end of the strategy does not come to a neat conclusion and is therefore less linear at the latter stages of development.

As these are two significant features of Complexity Theory (the whole as the sum of more than its parts and non-linear systems) and they are not easily recognised in the themes identified after the interviews, it seemed appropriate to consider them within the focus group discussions. Although this characteristic is not described in the initial findings key themes, Figure 13 illustrates how this category was highlighted for use more than other characteristics (in the interview question sets). This was partly in a response to the unpredictability characteristic that was grouped in this interview set, but also because of the absence in the teachers' discussion around the idea that sometimes school improvement improves more (or less) than it would be expected to. This is evidence of where I influenced the interviews and findings, as I was aware of absence of this characteristic in the data and for this reason considered it important to consider for the emerging theory. This characteristic question set was then used with teachers in phases 2 – 5. This response to the data collection is appropriate, as I have been critical of the linear approach to school improvement. I believe that the current processes for recording and measuring school improvement do not enable leaders to evidence the whole being more than the sum of its parts. Therefore, it was important to ensure this characteristic was represented in my data if appropriate. It could also be possible, based on my previous experience, that sometimes the whole is less than the sum of its parts. Therefore, further investigation into these characteristics was a necessary approach to take. This investigation took place in the focus group discussed in chapter 7.

The characteristic of Complexity reduction is also absent in the key themes. Complexity describes how systems can solve a more challenging problem by looking at a simpler problem first. Teachers did not describe this as a strategy that was used in schools. However, Complexity theorists could argue that there are some societal problems, that could be described by Rittel and Webber (1973) as wicked problems (problems that return over time because of the complexity and difficulty of solving them), that are being attempted to be solved in education. It could be suggested that attempts to solve these wicked problems are happening in some of the school improvement strategies the teachers discuss. An example of this could be the focus on vocabulary discussed by the English lead at one school. She discussed how there was a need to focus on oracy skills and vocabulary because of the deficit's children begin school with. The school is directly impacted on by what is a societal wicked problem, children's decline in oracy development in the early years. The systems respond with what could be seen as a simpler solution to a simpler problem, improving vocabulary of pupils in schools. While the intentions of this school improvement strategy are good, it will not improve the more complex problem causing the challenges seen in schools. This could be considered evidence of Complexity reduction.

Complexity reduction can also be considered as a limitation, due to the process by which complex systems are defined (simply through the process of studying them) reducing their complexity. Teachers do not appear to perceive school improvement in this way. Complexity Theory also describes the boundaries of a system and teachers did not see the school as having boundaries, or at least, the teachers were not limited by boundaries. This was evidenced when teachers discussed agents from outside of the school and discussed how school improvement was impacted by and impacted on, those agents. There were suggestions of boundaries imposed to school improvement, such as funding for strategies, and this warranted further investigation within the focus group. Complexity reduction is therefore considered again in chapter 7.

6.12 Chapter six conclusion

The key themes of Hierarchy, Experts, Training, Clarity, Dissipate and Trends are perceived by teachers to be important to consider when discussing school improvement. These themes directly link to the Complexity characteristics of agents and interdependencies. emergence, temporality, equilibrium, bifurcation point, self-organisation, loose coupling, and connectivity.

Complexity also uses the characteristics of non-linear systems, the whole being greater than the sum of its parts, and boundaries, to describe systems. These characteristics are not identifiable within the key themes offered by teachers in their discussions of school improvement. This would indicate that Complexity Theory is a useful and necessary way to highlight the discussions on school improvement. Without this theoretical structure these significant aspects of school improvement may not have been considered or studied.

The Complexity Theory characteristics that are absent from the initial analysis of the interviews and the key themes identified from the interviews, supported the planning of the focus group conversation. In addition, the tensions and impacts on the school, teacher, and pupil, were important to consider. The focus group was therefore used, not as a technique that ensures saturation, but as an opportunity to clarify teacher perceptions and consider a different lens on school improvement. This is now explored in chapter 7.

Chapter Seven: Findings and analysis – Focus groups

7.1 Findings and analysis Part 2

Chapter 6 discussed the findings from phase 1 – 5 of the study and offered the viewpoint that the focus group discussion could be useful to the emerging theory. Chapter 7 now illustrates the second part of the study's findings and describes the perceptions of teachers as they emerged from the focus group discussion.

The chapter will begin with the findings related to the recommendations for further analysis after part 1. These are the subjects that were identified as requiring further clarification or understanding after the analysis of the interview transcripts. The key themes (discussed in chapter 6) were also shared with the focus group and the findings from their discussion are then presented.

Table 8 (discussed in 7.5) illustrates the coding process of the focus group. The secondary coding reveals the areas for discussion at the end of this chapter. A summary of the findings from the focus group is then offered.

7.2 A reflection on research aim and objectives in relation to the findings (part 2)

Prior to beginning a discussion, I will consider how the focus group and the focus group findings address my research aim and objectives.

The research aim was:

- To understand teachers' perceptions of school improvement.

The focus group further exposed and clarified the emerging theory about teacher perceptions of school improvement. This was achieved by directing the conversation to expose both the impact on school improvement on stakeholders and a discussion about the emerging theory (the key themes discussed in chapter 6). This process also ensured the objective related to exposing teacher perceptions was achieved, as both points needed further clarification and had the potential to offer new learning.

In 7.41, I have described how the coding of the focus group data identified Complexity characteristics and what was learnt from this analysis. This supports another objective of my study:

- To develop a methodological approach that used the characteristics of Complexity Theory in its data collection and initial analysis.

In the focus group, specific characteristics were focused on due to their absence in the data analysis from the interviews. These were, Complexity reduction and the whole as greater than the sum of its parts. It was vital, when answering the research question, that I kept Complexity at the forefront of the research. Therefore, it was necessary to gain further understanding as to why these characteristics were absent in the research so far. I would suggest that this addressed my research aim and objectives. In identifying characteristics for consideration, due to the absence of them in the emerging theory, I also fulfilled an objective of this study (related to identifying characteristics of Complexity Theory in teacher perceptions), as I continued to strive to identify these characteristics.

7.3 Recommendations for further investigation after phase 1 – 5 – a discussion of the findings.

The interview data analysis revealed the need for further clarification in some teacher perceptions of school improvement. This was either a result of the absence of Complexity characteristics in the key themes, thought to be worthy of consideration, or where teachers appeared to demonstrate less clarity. These aspects included: the impact of school improvement on stakeholders, Complexity reduction (including the idea that schools are 'fixing' society's problems), and the whole as the sum of more than its parts.

7.3.1 The impact of school improvement on stakeholders.

Teachers were asked to discuss how they felt school improvement impacted on them individually, their colleagues, their school, and the pupils. A significant proportion of the discussion was about how school improvement impacted on teachers in their professional role. After two prompts, the teachers offered ways that school improvement impacted on their colleagues. The teachers did not discuss the impact of school improvement on the school or on the pupils.

As part of the discussion of how school improvement impacted on them, teachers discussed their perception of the impact of working with professionals from outside of the school. All the teachers wanted the professionals they worked with to be credible. The professional should be able to understand the school and its context, have had recent experience working in a school (and been successful) and should allow teachers to be able to make mistakes.

One teacher stated:

> 'It is difficult to agree with someone who hasn't worked in a school for so long'.

Another teacher supported the idea that an expert should have previously been successful and suggested that the expert should not be:

> 'A failed Headteacher!'.

As part of the discussion about the impact of experts working with them on school improvement solutions, one teacher also indicated that the experts needed to be credible, and that this credibility was related to trust.

> 'That goes back to trust. You need to trust the person and that doesn't happen overnight'.

The belief that the professional offering advice should be trustworthy, is also considered when one teacher describes how she implemented a whole school trauma informed approach (where teachers are responsive to possible unknown or known trauma in a child's life and recognise how these impact on their behaviours). The teacher explains how, when she implemented this strategy, she enabled other colleagues to make mistakes. This is supported by her colleague in the following comment in the conversation, when she states how experts can work productively with staff:

> 'That it is OK to make mistakes, and everyone knew that you would help them or be fine with it'.

Here the teacher is exemplifying the need for a trusting relationship, where it is accepted that the improvement may not always go well and that teachers will need to be able to be comfortable to make mistakes.

The credibility of professionals is also impacted on by the authority that they are perceived to have in the education system. One teacher recognised how Ofsted can

be a positive example of this and suggested that this was a necessary way in which schools are encouraged to improve. However, there were also negative connotations related to professionals or organisations directing school improvement and the impact this had on teachers. An example of where professionals were seen to be unproductive in improving schools, was when the targets the professionals gave the teachers (for example, in appraisal), were not practical.

'Sometimes they aren't 'doable''.

Here the teacher was sharing her frustration that there was a lack of practicality in what she was being asked to do. This was discussed by other teachers too, when they describe supporting others (and themselves) with finding practical solutions for areas they have been directed to improve.

Teachers were also impacted on by the challenges on their time and the time made available for school improvement. Teachers recognised however, that school improvement was still possible, even with this limitation. One teacher noted:

'We don't get the time to do it, but I think it can work'.

The challenging impact of limited time was also evident when teachers spoke about working with colleagues. They wanted more,

'Time to work together but also time to think about it afterwards'.

This demonstrated that teachers recognised the need for more time to complete school improvement strategies but also time to reflect upon them. This was also the case when teachers spoke about their monitoring activities, required as part of their leadership role. Teachers wanted more time to complete these activities, especially with the new requirements from Ofsted (expecting teachers to have an in-depth knowledge of the subjects they lead). This teacher was also reflecting on the time there was available to work with colleagues. This was seen to be a positive activity. Two examples of working with colleagues from their school were given and discussed in a positive way. One teacher stated:

'I worked with a computing lead, and it went well. I learnt a lot… It helped me do my role and I think computing got better in the school'.

Working with colleagues was perceived to be a positive response to school improvement and was perceived to impact positively on the teachers, although there

was no clarity in the outcomes of these projects or whether they were successful (rather than just perceived by the teachers to be successful).

7.3.2 Complexity reduction.

The area of Complexity reduction, noted because of its absence in the interview data, was discussed in the focus group. In the context of school improvement, I have proposed that an example of Complexity reduction can be described using Rittel and Webber's (1973) description of wicked problems. A wicked problem is one that is continually revisited and never successfully solved, due to the complexity and difficulty in finding solutions to it. The teachers were asked whether school improvement is in place to solve some of society's wicked problems. After some discussion of examples of where this is true, they were clear in their response:

> *'So yes, we do sort society's problem's out!'.*

The examples they shared were, tackling poverty, supporting their communities during the Covid-19 pandemic, and the vocabulary deficit in pupils starting school. This is an example of where the Complexity characteristic of Complexity reduction can be found in the perceptions of teachers about school improvement (when it had been absent in the interview data analysis). This would indicate that teachers agree that school improvement is used to solve some of the more challenging problems in society (for young people). In considering why this was not discussed in the interviews, I would suggest that teachers accept this role and do not challenge it, despite understanding the difficulties associated with the role and unlikely success of solving these 'wicked problems' (Rittel and Webber, 1973).

7.3.3 The whole as more than the sum of its parts and non-linear systems.

Teachers were asked to discuss whether they thought school improvement always went in the direction it was intended. Teachers agreed that on some occasions this was the case but that this was not the outcome all the time. This was summarised by one teacher who said:

> *'Both. Sometimes more. You might improve things or improve things in a different way than you planned. Some of the meetings I have with parents are for one thing, but we sort lots of other things out'.*

Teachers also recognised that school improvement can go in different directions because of the lives that the pupils lead.

> *'Different directions. That's schools. Things happen and you don't know they will. Also, we can't control everything, like the children's lives at home'.*

This is also indicative that teachers recognise the non-linearity of the pupils lives and experiences and the impact this can have on schools. When asked specifically about non-linearity (after an explanation of the concept) a teacher described her experience with an outside professional giving her conflicting advice from a year prior. However, teachers were unable to give examples of where school improvement was non-linear.

7.4 Focus group discussion about the key themes

The key themes identified after analysis of the interviews (and discussed in chapter 6) were also shared for discussion in the focus group. However, as the key themes were discussed at the end of the focus group, some of the subjects had already been covered. Therefore, the themes Dissipate, Trends and Relationships were not identified individually for discussion. The theme of Dissipate had been discussed when teachers described individual school improvement strategies and how they appear to finish without a conclusion. This information was offered when the teachers talked about two collaborative projects, where an unsatisfactory ending to the projects had occurred, and no conclusions were made (discussed in 7.3.1). Similarly, the teachers had made suggestions about Trends in school improvement and the success of some strategies and limited success of others. The Relationship theme was also covered in a discussion about the impact of school improvement on teachers and their colleagues. However, some of the themes had not been debated, therefore the themes that the teachers were asked to discuss, included: Hierarchy, Experts, Training, and Clarity. The focus group transcript can be viewed in appendix 13.

7.4.1 Hierarchy

The focus group agreed that there was a hierarchical structure related to school improvement. One teacher summarised this:

> *'Headteachers, the deputy and senior leadership team can change things, so can everyone else but not as easily…or quickly'.*

This is the case with decision making about the focus of improvement but also relates to the funding opportunities given to individual strategies. It was recognised that the hierarchical structure in school and outside of school, controlled the funding. This included funding related to grants that are controlled by government and local authorities, such as the primary sports grant (PSG) that ring-fences spending to activities related to funding additional and sustainable improvements to physical education in English schools. A teacher explained:

> *'Also, deciding the money (the hierarchy). What gets spent. We just mentioned PE. That's a good example'.*

The subject of funding was discussed at length in the focus group and is therefore considered separately in 7.5.2.3.

7.4.2 Experts

When the key theme experts was explained, the teachers discussed the perceived impact the experts had on them as professionals.

> '*If we get told to do things, we all want to get it right. We want to change if we need to. If someone tells us to.'*

Other teachers supported this view:

> *'I agree. We want to be good at our job… It forces you to do better even if you think you can't'.*

Teachers discussed the credibility of the experts (already described in 7.3.1) and wanted experts not just to tell them to change but how to change in a practical way.

> *'The experts you describe tell us what we need to change but it is better when they tell us how'.*

This teacher is requiring support in the change process, and this was discussed when the key theme of Training was explained to the group.

7.4.3 Training

Offering an explanation that training could include training from in-service days, training as part of their appraisal process (where it related to identified school

improvement) or training in school, the teachers perceive that any training that takes place with all staff is the most successful. This is because there is a shared understanding and after the training:

'*Everyone does it'.*

This demonstrates that by training all staff together, school improvement change can happen more rapidly because everyone shares the responsibility and bring about the change collectively.

When suggesting the perceived need for a collective response to improvement strategies, the credibility of those giving the training was referred to, as was the time for training and reflection. The key theme, Trends, was also recognised in this part of this discussion, where a teacher referred to a strategy that was no longer being used as having poor quality training.

Training was seen as a challenge (because of time, trends, and the credibility of the trainer) however it was also viewed positively. One teacher remarked, that with time for training, time for resourcing and appropriate staffing in place, training was successful. Time for reflection on the training was also perceived to be vital and often absent in the school improvement process.

'I agree but I think if we have given it the time, time to train or make new resources, we should think about whether it was good. Did it work?'.

Here the teacher is identifying how time for reflection about the training they have completed is important because of the impact this would have on school improvement. In her description, the teacher is describing the theme of Clarity (noted in the interview data) and the importance of the clarity at the end of a school improvement strategy.

7.4.4 Clarity

The teachers agreed with those from the interviews, that there should be greater clarity in the reasons for and outcomes of school improvement. They perceive that this clarity will have a better outcome on their motivation to carry out the strategies and that this will have a stronger outcome for the school.

> *'I agree with the teachers. It shouldn't be a guessing game. That won't have a good outcome for anyone'.*

The other teachers agreed:

> *'The clearer the explanation the more likely we are to do it and do it well. Also, the better for everyone and the school… It should be understood. There is no point improving something if it doesn't ned to be improved'.*

The focus group therefore agreed that there needed to be clarity in the school improvement discussions and strategies, that there was a hierarchical structure in school improvement and that this impacted on decision making and school improvement focus. The group also identified the positive impact of training (under the right conditions) in the same way as teachers in the interviews, but they did not relate training opportunities to the hierarchical structure that they identified as present in the school system.

7.5 Coding of the focus group.

The focus groups were coded initially using Complexity characteristics. The codes that were used are illustrated below in Table 8. The data was then coded using open coding and these codes are also illustrated in Table 8. Table 8 does not show a relationship between the initial and secondary coding, and they should be considered as independent from each other.

Initial coding – Complexity characteristics noted in the transcripts	Secondary coding – open coding identified in the transcripts and not related to the Complexity characteristics identified in the initial coding	
Temporality	Wicked problems	Relationships
Connectiveness and loose coupling	Credibility	Time
The whole as the sum of its parts	Trust	Learning from others - collaboration
Unpredictability	Workload	Funding
Complexity reduction	Practicality	Positive tension
Agents	Monitoring	Negative tension
Non-linear/feedback loops		
Equilibrium/bifurcation point		

Table 8: Codes used in the focus group transcript analysis.

All the Complexity characteristics used in the definition of Complexity (provided in chapter 3) were identified within the focus group discussion. Complexity reduction, non-linearity and the whole as the sum of its parts, were all specifically referred to in the question prompts, however, the other characteristics were not. This demonstrates the suitability of using Complexity in the study of school improvement.

7.5.1 Coding the focus group using Complexity characteristics – the findings

Teachers talked about the challenge of time or in Complexity terms, temporality, in school improvement. The teachers discuss time to work with others but also time to complete school improvement tasks. Teachers also discussed how strategies changed over time. Teachers' relationships with their colleagues and the impact of the connectiveness (how teachers relate to each other within a system) on school improvement was referred to. One teacher explained a challenge related to connectiveness and described how she worked closely with a colleague and then this colleague need to make some improvements. She said:

> *'Luckily it was OK, and he understood. It could have made this tricky'.*

This demonstrates the challenge that teachers face when they are connected closely to those they are working with, when improvements need to be made.

Teachers identified points at which the equilibrium was challenged (the bifurcation point) and that some changes were unpredictable. An example of this was when a school improvement advisor came into the school to offer conflicting advice. This unsettled the equilibrium and became the point at which change needed to be made. It was unpredictable because of the differing advice.

In addition to the initial coding related to characteristics of Complexity, open coding also identified additional findings of interest, and these will now be considered.

7.5.2 Coding the focus group using open coding – the findings

At the secondary stage of coding, twelve codes were used to organise the data. These were: wicked problems, credibility, trust, workload, practicality, monitoring, relationships, time, collaboration, funding, positive and negative tensions.

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The codes: relationships, credibility, time, practicality, trust, collaboration, and wicked problems have been discussed in 7.3. Relationships, credibility, time, trust, collaboration, and practicality were discussed in the section about the impact of school improvement on stakeholders (7.3.1) and wicked problems were considered in the section about the characteristic of Complexity reduction (7.3.2). This discussion will not be repeated in this part of the chapter, however, the other 5 codes and how they were described by teachers, will now all be explained.

7.5.2.1 Workload

Focus group discussions about the key theme Clarity also highlighted concerns around workload. Teachers identified the impact of the worldwide pandemic (Covid-19) on staff workload, particularly within the school improvement discussion. While it was recognised that some school improvement strategies were forgotten during the partial school closures, teachers recognised the increased expectation for improvement during this time. One teacher stated that:

> *'They were constantly wanting us to do things better online and we often explained how it was working better'.*

Much of the teaching went online during the lockdowns caused by the Covid 19 pandemic (when schools were closed to most children and remote learning took the place instead of children learning inside the school building). Teachers discussed how this didn't stop the need for improvement, with teachers receiving direction about how to improve their teaching during this new period of working. In addition to this, they noted the difficulties associated with the period of lockdown (not associated with school improvement) and the impact on workloads since.

Workload challenges are also related to the next code used to organise the transcripts, monitoring.

7.5.2.2 Monitoring

Monitoring is a school improvement task that the teachers in the interviews and the focus group discussed. It is perceived to be closely linked to school improvement. Monitoring is described as helping a leader to:

'Improve my subject'.

However, the demands of being a classroom practitioner can hinder this. The same teacher (that recognised that monitoring could help her make improvements in her subject) explained how she would like to talk to children as part of the monitoring, but there often isn't time. This is seen as hindering school improvement and her view is justified because she notes how Ofsted inspectors speak to children when inspecting a subject in school. Monitoring is also related to the Relationships theme and was discussed when teachers were asked about the impact of school improvement on their colleagues (discussed in 7.3.1). This discussion related to the impact monitoring can have on teachers' professional relationships and how a strong professional relationship can support a positive outcome of monitoring in cases where an individual needs to make improvements.

7.5.2.3 Funding

The conversation about funding was related to other areas of discussion. It was introduced into the discussion when teachers were talking about the hierarchical decisions that are made about school improvement. The teachers' perceive that some funding decisions are made because of decisions that are out of the schools control (such as decisions about the pupil premium grants and primary sports grant). They also find this challenging because they identify that the pupils have different needs and perceive that the spending should be spent elsewhere.

> *'How can we make learning better for them (pupils) if we can only spend money on footballs'.*

This is a direct reference to the primary sports grant and how the funding is ring-fenced (and can only be used to buy physical education resources, such as footballs). However, funding restrictions are also seen more positively, as teachers perceive how the restrictions prevent the budget from being wasted. Teachers also recognise that some of the ring-fenced funding is a suitable response to pupil needs (such as the pupil premium grant). One teacher explains:

> *Yes, and now we can spend it on all the children. That is better. We just said about society problems, well that is a good example. The extra we get for pupil premium. They are disadvantaged so we spend more on them'.*

There are also some restrictions that are perceived to be unnecessary or provide additional challenge when teachers are tasked with improving an area of the school. Teachers describe how some strategies are not well funded and that they must work hard to ensure that the budget gets spent in the areas they are required to improve. The challenges that the teachers describe were also identified in the codes 'positive tensions' and 'negative tensions'.

7.5.2.4 Positive and negative tension

Throughout the focus group discussion, teachers shared the challenges associated with school improvement. They described their perception of how situations, people, and activities challenge them in both a positive and negative way. These challenges are perceived to impact on school improvement strategies. I would propose that these challenges are tensions in the system. Sometimes they can be positive and the tension challenges and forces positive change. However, sometimes they can have a negative impact on change and these tensions hinder school improvement strategies. Throughout the analysis of the focus group, tensions are identified, and these are discussed in chapter 8.

7.6 Chapter seven conclusion

The focus group offered an opportunity for teachers to offer a cooperation of knowledge, as well as offer a different lens to the teachers in the interviews. This chapter has confirmed that teachers recognise a hierarchical structure in school improvement, perceive that experts impact on their role in school improvement, suggest that training can be useful when time is given for reflection, and that the clarity surrounding school improvement is vital. Chapter 7 also describes how teachers perceive there to be tensions surrounding workload, Complexity reduction, monitoring and funding.

Chapter Eight: Findings about teacher perception of school improvement

Chapter eight provides an analysis of the key findings about teacher perception of school improvement. The findings are presented as five tensions. These tensions are Credibility, Time, Practicality, Power, and Striving for equilibrium. Each of these tensions have formed a category for discussion. Each of these categories are then described, as they were by the teachers in the study, by school improvement system requirements and activities that created the tension. This creates subcategories within each tension. The chapter begins with a discussion about the word tension and why it has been used to explain and describe how teachers perceive their experience of school improvement.

8.1 Tension

The negative and positive connotations associated with the word tension is a reason for it being a suitable way to describe school improvement. Initially, discussions about school improvement can provoke a response where the negative overshadows the positive. However, after further thought, the concept of school improvement offered opportunities for a more positive response from those discussing it. This is much like the word tension, which when initially considered may infer negativity, however, when discussed in more depth, can also be viewed from a more positive perspective.

Using the word tension to describe teacher perceptions of school improvement may imply negative connotations towards a system in the process of change. However, when analysing the data this was not always the case. While the word tension can be used to describe stress, pressure, or strain, it can also be used to describe strength, such as the rigidity in the tension of a bridge that ensures there is a balance suitable to channel its load. The word tension is also used to describe the feeling before a momentous occasion or before an exciting performance on stage. Similarly, the positive suppositions of the word tension are suggested by teachers when they discuss school improvement. That is, they describe negative tensions that may cause stress but also the positive, such as tension before a positive change

or new strategy. Therefore, tension in the system is not always considered a barrier to positive working practises, reform, and change, but sometimes as providing an opportunity, much as the tension in the cables of a parachute allowing it to descend.

A good example of this is found within the first tension category, Credibility. External consultants who were not credible professionals in relation to the area they were advising on, were perceived by teachers as negatively impacting on school improvement. In contrast, external consultants who were credible, due to their perceived knowledge and experience, were seen as a springboard to improved performance and outcomes for pupils.

8.2 Credibility

The Credibility tension is categorised using six tension examples. These are, the credibility of external sources of school improvement (both as agents who suggest ways to enhance performance and as agents of identifying the need for change), the credibility of training providers, the credibility of new ideas or trends, how trust is formed within credible relationships, understanding why school improvement is taking place, and the tension between the expectations of formal paperwork and finding practical solutions to problems.

8.2.1 External agents of improvement: support and challenge

The first of these examples is the credibility of external sources. External providers of both school improvement support, such as school improvement partners and consultants, and external providers who identify school improvement needs, are areas where credibility is perceived as a tension in the system.

A key theme identified after data analysis of the interviews, was that of Experts. Experts, such as school improvement partners and consultants, are external providers that offer policy and practise suggestions to support the enhancement of school provision. One way that tensions arose were when, the experts (school improvement partners or consultants), were not seen as having suitable experience or knowledge of the school. Teachers were concerned that external personnel were

unable to provide suitable advice when they were perceived as being disconnected from the day-to day running of a classroom and school. One teacher remarked that:

> *'It is difficult to agree with someone who hasn't worked in a school for so long. Things have changed and we do things differently. Maybe they should come and work here for a while and then they would see what we do'.*

This created a barrier to school improvement, with teachers indicating that consultants who were perceived to be ineffective, offered targets that were not needed or had little impact on improving the school. Teachers could reflect on times where they felt their opinions about external expertise advice had been justified, with teachers commenting on how other experts had come into school and given an alternative view or recommended a differing approach. Teachers used school improvement partners (SIPs), sometimes called school improvement advisors, as examples of where this occurred.

> *'One SIP might say one thing and then a year later someone says the opposite and we knew that all along'.*

The experience of school improvement partners (SIPs) was identified as having significant impact on the credibility and perceived quality of involvement in Swaffield's (2015) study. The study considered the English national policy of commissioning SIPs into schools as a way of supporting headteachers with school improvement. The Department for Education and Skills, in 2006, required all schools to have a school improvement advisor (Department for Education and Skills, 2006). Swaffield's (2008) evaluative study of this policy noted that the experience of the SIP was found to be varied, with tensions arising when SIPs had to produce reports for school Governors and local authorities, while maintaining a trust relationship with the headteacher they were working with. Criticism was found when SIPs were perceived as being used for surveillance and discipline, rather than for support and challenge. While this study identified clear tensions between the SIP role and school improvement, the study does not suggest whether there were differing needs in each school in the study. For example, it could be possible that the schools that felt that they were being watched rather than supported, may have been underperforming for some time, or there may have been concerns around the capacity of the leadership. In contrast, schools that felt supported might have been those that had recently had positive external reports or outcomes or were being led by headteachers that were more outward facing in their approach to improvement. Ferris (2013) also offers an

alternate view, that the tension is caused by a nationally developed agenda and the SIP responsibility for accountability.

These studies show that the external provider of support have been viewed in previous research as having a low impact and potentially detrimental impact on school improvement, however, the credibility of external professionals who were making suggestions about how to improve, was also demonstrated to be a positive experience for teachers in my study: One teacher noted:

> *'All she has to focus on is maths. She is brilliant and really helps us to understand. We have so many hats. So many things to think about. It is great to have an expert… just maths'*.

The credibility of the consultant who is recommending ways to make changes, described by the teacher in this example, shows how external support can be received in a positive way. However, external agents are also used to set targets for school improvement. These experts are also perceived by teachers in both a positive and negative way, mirroring the opposing perceptions identified in the data of how teachers received advice from external experts.

An example of an external expert, identified by teachers as providing targets for improvement, are the Inspectors working for the Office for Standards and Education (Ofsted). Teachers both welcomed and disagreed with recent inspection outcomes as concluded by Ofsted inspectors who had visited their schools. One teacher explained that:

> *'Ofsted help us decide where the focus should be…based on research, newest research'.*

Other teachers were less positive about the setting of targets by Ofsted inspectors, with one remarking that:

> *'Ofsted set the targets and we have to do them'.*

Therefore, teachers recognise that there is an expectation in education that external advisors will make evaluations about their schools and will report on their findings, providing school improvement targets. However, they both question and support the credibility of the inspectors. This was also the perception of those consulted in Braukmann and Pastiardis (2010) study, where they identified a different tension, one between inspectors and their 'practical school experience' (Braukmann and

Pastiardis, 2010, p. 344) rather than between inspectors and their practical knowledge of the school. This study was completed in Cyprus and looked at the Ministry of Education inspectors and their approach to inspecting the design of the curriculum. It could be argued that while those working in schools studied by Braukmann and Pastiardis (2010) queried the credibility of inspectors, this might have been because inspectors were found to be looking at the principal's work rather than the intended expectation of the inspection, to inspect the curriculum. Braukmann and Pastiardis (2010) suggest that inspectors should be more transparent in their evaluation criteria to be credible. This contrasts with a study in England, where Baxter and Clarke (2013) conclude, that Ofsted need to ensure they are credible by considering how internal professional judgements can be used in the evaluation. Similarly, Quintelier, Vanhoof and DeMaeyer (2018) describe how teachers are unwilling to take on board Ofsted inspector feedback when the inspectors are perceived to be inadequately informed.

The credibility of external providers of school improvement, who both support and challenge schools, were identified in the data alongside the use of external training providers. Tensions were identified related to the credibility of these providers.

8.2.2 Training and trends

Teachers recognised the credibility of some training providers, based on their experience and enthusiasm for the training content. This was also contrasted with the credibility of training that focused on trends that were perceived to be, as Allen, Evans and White (2021) identified, as the next big thing.

> *'Training can be good or … less useful. It depends on who does it'.*

Another teacher agreed with this:

> *'Well sometimes it's the person doing it. If they love what they are doing then it is contagious, you want to do whatever (they recommend)'.*

Allen *et al.* (2021) consider how the education system is required to respond to improvement trends that often do not stand the test of time, and do not have the longevity and outcome that they promised. This is recognised by teachers and the perception of some improvement strategies potentially not having longevity or even having been seen before by more experienced teachers. This creates a conflict or

tension when experiencing school improvement. However, where training and the strategies taught to teachers in the training have both longevity and perceived positive outcomes in the classroom, the impact on the teachers was viewed more positively. One teacher discussed the recent requirement for schools to use a synthetic phonics programme (an improvement strategy also identified by Allen *et al.,* 2021, as having strong outcomes) as a trend she felt brought about positive change:

> *'All children learning phonics in this way, in such a structured way, has been so good. The children are building on what they know, and we know what comes next. That is a good one, erm, school improvement, that we have done. We got that one right!'*

This can be compared to the next comment from another teacher who contrasted this teacher's view:

> *'Except, do you remember ELS (English Literacy Support)? The training was awful, so was ELS. That didn't last long (in school)'.*

Trusting that a strategy will remain relevant is important to teachers, as is the trust in the relationships teachers retain.

8.2.3 Trust

Evans (1998) concluded that trust is essential in any leader relationship. Muijs (2008) would support this, as he found that building trust in collaborative working in rural schools was vital in exploiting positive outcomes of joint working. He recognises that distrust occurs when schools do not understand the motivation behind collaborative work. Teachers in my study also perceive trust as being a key to any credible relationship within an improving school. Teachers perceive that to bring about change in their practise or to lead change within their school, colleagues need to be able to trust one another. In the focus group, one teacher said:

> *'That's because you work with everyone. Everyone knows you well. They believe what you say is right'.*

Another teacher in the focus group supports this and states:

> *'You need to trust the people telling you to change'.*

This was also perceived to be an important aspect of any collaborative work between principals, in Bickmore, Gonzales and Roberts (2021) study. They found that the

opportunity to provide authentic feedback to each other (principal to principal) was an effective way of developing a school. The principles in their study stated that this was an effective way for all the professionals to grow in their roles in schools.

Trusting that, when a strategy does not go as planned, teachers will still be well supported by their peers, is important. So is trust in the credibility of those (including themselves) suggesting the change. In the focus group, a teacher brings this to the forefront stating that, it is difficult to trust what someone is recommending (or agree with them) when they haven't:

> *'Worked in a school for so long'.*

This recognises that professionals are less credible and less trustworthy if they haven't had similar recent experiences to the teachers they are advising. Credibility and trust are built over time, and teachers understand this and how important it is to learn from others.

> *'You need to trust the person and that doesn't happen overnight'.*

However, the same teacher finds an alternative in the example of Ofsted, who are seen to be trustworthy because of their credibility in education. Trust also supports change when time is given to build relationships with colleagues from other schools. This trust, formed over time, develops a credibility in the relationship and advice the teachers give each other.

This finding (that trust is developed over time) is in contrast with the conclusions of Hart (1994), who suggests that there is trust in schools where performance is rewarded. However, Hart's (1994) study outcomes could be questioned when considering how the rewarded performance was measured. It is unclear how Hart (1994) identified the 'best' teachers in her study and therefore it is difficult to understand why certain teachers recognised that performance related rewards as being successful at bringing about change. Backman, Alerby and Bergmark (2012) also consider trust an important theme in changing outcomes for school, but they see this trust between teachers and their community as being the most important factor.   This is supported by Wendt (2012) who recognises that the trust between teacher and parent is important in developing credibility within their community. While the parent and teacher trust relationship may not directly be considered as

impacting on school improvement objectives (unless parent engagement is a school improvement outcome) it could be argued that with this trust and credibility comes opportunities for improving outcomes for pupils through home/school working.

8.2.4 Understanding why

Muijs and Harris (2007) linked having a trusting culture and a shared vision of how the school needs to improve, as important features of strong teacher leadership. In addition to the credibility of trusting relationships and external sources of improvement, teachers in my study also discussed the vision by describing how they need to understand why a strategy of improvement was needed. The credibility of reasons given for improvement by colleagues working within the schools is another tension identified within the Credibility tension. Teachers did not question the credibility of their colleagues understanding of the school or what needed to change but rather that they did not understand why the improvement strategy was needed. The absence of understanding in why strategies had been chosen was identifiable and perceived by almost all the teachers spoken to. In missing or not focusing enough on the reasons for the improvement, schools were losing the credibility of their actions. The perception of teachers who felt there was a credible reason shared for the improvement strategy, was that they understood what they change should look like and could consider what the outcomes and impact might be on them. However, where a credible reason for improvement was not perceived to have been provided or reflected on, teachers were vague about expectations, outcomes, and impacts on themselves, pupils, and the school. This also created unpredictability and directly links to the key theme of Clarity found within the initial analysis of the interviews.

Time for reflecting on a credible reason for improvement is perceived to be an important part of the school improvement process and this indicates another tension within an improving school system.

8.3 Time

The Time category is described by teachers with examples of the tensions between school improvement and time for review, workload, impact of the Covid-19

pandemic, pressure to change practise, time for training and reflection, time for monitoring and leadership and collaborative working. These examples will now be explored and discussed.

8.3.1 Time for review

The need for time to reflect on strategies that have been implemented before they are forgotten or potentially perceived by some as complete, is a tension teachers identify within the school improvement discussions. One of the key themes (discussed in chapter 6) is described by demonstrating how strong school improvement has a legacy. Teachers do not always recognise the legacy left from school improvement. This is evident through their often-vague descriptions about the outcomes of strategies they have been asked to trial or implement. They are also often disillusioned when a strategy they have invested in is no longer mentioned and seems to 'fizzle out' (described in the key theme of Dissipate). This is particularly the case when, as a leader of the project there is no conclusion or direction from leaders about whether the strategy should continue or stop completely. Additionally, if a strategy has been perceived to have been forgotten, there is often confusion as to what the current practises and expectations are. Considering the time invested in improvement strategies, identified by Backman *et al.* (2012), offering opportunity for reflection would be preferable to teachers.

> *'I agree but I think if we have given it the time, time to train or make new resources, we should think about whether it was good. Did it work? I know that is more time but maybe we just need to do less and take the time'.*

This teacher acknowledges that reflection on what has been achieved is important, due to the time and efforts colleagues invest in the school improvement strategy or change. However, she also understands that this additional time devoted to review could be perceived by some as adding to the time pressures of school life. While this teacher recognises how time for reflection on previous strategies is important, she also stipulates that it is necessary to consider the impact on colleagues of devoting more time to a concluded activity (particularly if it was perceived as ineffective). It could therefore be considered that reviewing school improvement strategies could increase teacher workload, another tension identified within this category.

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8.3.2 Workload, pressure to change practise, reflection on training and the pandemic

Teachers identify the pressure to change their daily practises, the global pandemic (Covid 19) in 2021, and opportunities for reflection on training, as increasing their workload. The tension between their time and their workload increases because of these examples. Morris and Ferguson (2000) also recognise the constant change found in schools and consider how these changes impact on teachers' stress. They conclude that schools should look closely at working practises before embarking on new strategies for improvement. This indicates that teacher workload is an important factor when considering school improvement.

One teacher noted:

> *'Things are so busy already and changing things doesn't help. There is a lot of chat about workload, but I don't know, it doesn't seem to make a difference'.*

Later in the discussion another teacher referred to this point:

> *'I know you said workload is hard but it's not as bad as it was. Covid…erm…school closing…or not closing, that really increased things. We had to get better at things we had never even done before. Teaching from home, parents, coming into school and trying to cope with the changes. It was worse then. Lots of the things we had planned, remember, we had all those plans after Christmas, we just forgot.'*

The teachers in this discussion continued to agree that workloads had increased during the Covid-19 pandemic, despite many of the school improvement plans being paused. In the focus group, teachers agreed that improvement processes were now back to where they had been before the pandemic (in the summer of 2022).

While discussing the workload related to school improvement post pandemic compared with pre-pandemic, teachers also identified an aspect of their leadership role that they found impacted on their workload in both a positive and negative way:

> *'Coming back from training and thinking about all that you need to do. All that you want to do. Then things get easier because you change your practise. So, something that took a long time before and you didn't get results, gets easier and the children improve. Behaviour strategies or help with our new (Main information) system'.*

Opportunity for reflection on training is initially perceived as increasing, and then over time, decreasing their workload. Teachers recognise that this has a positive

impact on improvement and supports the change process related to ensuring better outcomes for children and teachers' time.

8.3.3 Monitoring and leadership

Teachers discussed their leadership roles when discussing how school improvement occurs over time. They recognise the tension between their teaching role and the time they can devote to the monitoring and other leadership responsibility. Teachers recognise that they must complete much of this work outside the school day but recognise the importance of monitoring taking place while the children are present; an activity they do not get the time to do as much as they would like. One teacher stated:

> *'I think it's important to talk to the children as part of the monitoring. Ofsted do this too. We try to do it at our school because sometimes the books don't show you everything. There isn't the time. Who will have my class when I do that? A supply teacher isn't the answer, but I don't know what is. I don't have an answer, but I know that to improve a school you need to talk to children'.*

The focused activity of monitoring is proposed as a necessary part of school improvement as a school leader, however, there is tension created when there is not enough time available to complete these activities.

Other leadership activities were also identified. They included having time to support staff with planning. A school special educational needs and disability coordinator (SENDCo) recognised that she was fortunate to have this time:

> *'I work with lots of people from outside the school. I mentioned them before. Educational psychologists, specialists in dyslexia…. I have to share that information with others. I get the time to do that each week and it makes a difference. We see that it makes a difference to the children we have been discussing. But, some people, other teachers, don't get that time, not regularly. I do. They don't get time to help others and they might be knowledgeable about something. That's leadership, isn't it?'*

Here the leader is enabled to have the time to complete the monitoring and planning activities and acknowledges that this is not the same for colleagues who have differing leadership responsibilities. The SENDCo is demonstrating that there is value in having time to work with others collaboratively, which is another tension perceived by teachers and is grouped in the time category.

8.3.4 Collaborative working

Collaborative working (described by the teacher above) was identified by teachers as being a useful aspect to school improvement, however, the time to engage in this activity was a tension identified by all those who discussed the merits of this activity. Opportunities to learn from others, both within their schools, and outside, was identified as a useful way of improving practises in schools but weighed heavily on time outside of the classroom. Cooperative working is identified by teachers as a useful process for improvement but acknowledged by teachers as creating tensions related to time limitations due to other school commitments.

> *'We all would love to do more (working with other schools) but we have marking, getting things ready for the next day, stuff like that'.*

Additionally, opportunity to reflect with other colleagues about joint projects they had worked on was also important. Wettlaufer and Sider (2010) discuss how colleagues can work together in projects in their study into the use of professional learning networks (PLCs). They define the PLCs as, when educational professionals come together with an area of common interest. The key outcome from their study was the need for trust between the individuals and that trust took time to evolve between the professionals. Ainscow, Muijs and West (2006) also identified the positive outcomes from strong inter-school collaboration. This included building capacity of staff. They also found (as did Wettlaufer and Sider, 2010) that time was important for schools but that this was useful to give schools time to challenge their existing assumptions. Ainscow, Muijs and West (2006) also found that collaboration raised expectations of vulnerable learners and changed schools from being insular to forward facing.

Teachers in my study also noted the building of relationships over time in these collaborative projects, however time was seen as a barrier for this productive relationship continuing. Time was also a barrier preventing the potential for the collaboration to continue to be effective. Teachers describe how they benefited from relationships over time, with one teacher discussing the merits of working with a computer leader from another school and another suggesting that children's vocabulary development improved after a collaborative project with another school. In both examples, teachers discussed how the collaborative work improved over time, as the professional relationship developed but could not continue due to there

not being the time to devote to any further work. However, the teachers recognised that the choice to continue these projects was often made by those with power in their organisations, described in the next of the five tensions.

8.4 Power

The third category describes the tension between the amount of individual power colleagues have and the amount of opportunity they must make the changes needed to improve areas of the school. Within this category, teachers describe the tension between power to make a change and the school hierarchy, the power to make decisions, balancing the leadership power and colleague relationships, internal versus external identification of school needs, and ring-fenced funding.

8.4.1 Hierarchy and decision making

In the themes identified after initial coding of the interviews, the theme of Hierarchy was identified, and that theme is closely linked to this tension category. This is because of the link between the power of those at differing levels of the school leadership hierarchy. This hierarchical approach to school leadership was also identified by Katzenmeyer and Moller (2001). In my study two teachers discussed the hierarchical power in the school, agreeing that:

> *'Headteachers, the deputy and senior leadership team can change things, so can everyone else but not as easily…or quickly'.*

This perception of teachers, that a hierarchical structure impacts on school improvement, is indicative of the belief that there may also be feelings of powerlessness. Although this was not directly discussed, teachers would feel less power to make change depending on their seniority within the school.

The tension between the differing levels of the hierarchy (and the opportunity for decision making) because of the differing levels of power they had, was identified as an important tension. The differential between the power of those who make the decisions and those who work at the 'front line' (Harris and Muijs, 2005, p. 20) is identified by Harris and Muijs (2005). They state that there is a need for all those leading change to be involved in the decision making and development of strategy. In my study, those at the top of the hierarchy (usually senior leadership teams and

headteachers) are perceived to make the decisions about the direction of school improvement and those with less power (lower down the leadership hierarchy) have limited opportunities to make decisions about what and how to improve. This is described by one teacher in the focus group:

> *'You know how some people just get to decide (others in the focus group agree by nodding)? Well, sometimes we may see something important, and it won't be done or included in the plan'.*

This tension between those that have the power to decision make and those that perceive they must carry out the actions, was recognised within a 2021 Ofsted inspection of Abbott Lea School in Woolton. Inspectors who visited the school recognised that the school required improvement. One of the concerns raised in the report was that there were tensions between leadership and teachers about how to move the school forward. These tensions were seen to be hindering the improvement of the school. Therefore, tension identified by the teachers as related to the power that some professionals have over them to make decisions about school improvement, was also considered an obstacle to improvement by the Ofsted inspectors that inspected Abbott Lea School in Woolton in 2021.

Wullschlegar *et al.* (2022) research into Swedish school improvement found that external expectations related to expected reform were rarely successful at developing schools. Wullschlegar *et al.* (2022) note that schools find internal solutions to the reforms. This could relate to the tension felt by teachers in my study, as teachers identified how those with power were perceived to not always be in the best position to offer change requirements. Therefore, the teachers in Wullschlegar *et al.* (2022) study found their own solutions. However, Wullschlegar *et al.* (2022) study could be criticised as not identifying why some schools were more capable of making successful changes in the schools they compared. It could be that those in power in some of the schools relayed the school new improvement reforms in a different way and therefore became a stimulus for change rather than a hinderance. This was how teachers in my study perceived the power tension, as both a positive opportunity for change and a challenge to the school improvement process.

However, the decision to make changes are not always seen to be taken by those that work in the school for most of the time. The power for making changes is often recognised to lie with external professionals, particularly at the point of identifying an

area for improvement. Examples of external decision making included, local authorities, multi academy trusts, Office for Standards in Education inspectors (Ofsted) and school improvement partners (SIPs). Teachers felt left out of the decision-making process in these cases, with leadership (higher in the school hierarchy) often being the link between themselves and the external professional bodies. They felt powerless in this process, being told what to improve, rather than consulted. Teachers often felt these decisions missed opportunities for improvement.

Pollock and Winton (2012) identified a similar tension in their study of a Canadian school where the principal had determined that the area for improvement should be character education. However, the district identified writing as the area for improvement. As a result, the principal placed the primary target as character education and the secondary target as improving writing outcomes. At the end of the year outcomes demonstrated a decline in scores for writing but improvements in character education. This would suggest that when there is a disagreement between a principal and district agreed focus there is an impact on school improvement. It would seem important, therefore, to consider why this is what Pollock and Winton (2012) found to be the case. Potentially, although Pollock and Winton (2012) do not come to this conclusion, it could be argued that this demonstrates the importance of leadership or teacher 'buy in' on the area of improvement focus. While the tension described in my study focuses on the teachers' perception of decision making rather than the implementation of an external target by leadership, there is a similarity in the tension between the power to make decisions from external bodies and those who must implement the change.

This tension is also mirrored in Greany's 2015 study of two schools, one in Coventry and one in the London Borough of Brent. These schools were identified for support by their local authorities. The involvement of the local authority in school improvement of these schools was directly linked to a policy of the British coalition government elected in 2010. The coalition government focused their educational policy on the local authority's responsibility to improve schools. They identified tensions between the schools and the local authorities, with both what the areas of improvement should be, and what the solutions should be. The local authority was tasked with challenging the school by indicating ways the schools should change.

However, there was a tension between these ideals and those ideas the professionals that worked in the schools had about the changes that needed to be made. Those who worked in the schools Greany (2015) studied, had differing views about the changes made as they felt them inappropriate for the context and the communities the schools served. These findings are different from those in my study as the teachers I interviewed discussed how decisions are made by those that have power in their schools (rather than by the local authority). Greany (2015) concluded that robust peer review was a credible way forward for schools to identify areas for improvement and holding local authorities accountable was preventing this robust process taking place in an effective way. The teachers in my study appear to suggest that school review does take place (but is influenced by external advice) compared with Greany's study that suggests this peer review is not superseding the local authorities expectations for areas of improvement. It could be argued that in 2015, when Greany was writing, the Conservative government was elected, and the academy agenda was gaining increasing focus and preference by the government. The preference for increasing the control of schools by multi academy trusts, rather than local authorities, takes the responsibility and funding from the local authority, giving multi-academy trusts the responsibility of improving schools. This mirrors the findings of Greany's (2015) study, that peer review is more effective than local authority review, in school improvement. This indicates that the outcomes of the study mirror those of the government's ambition for academisation at the time. In contrast to Greany's (2015) study that found a lack of peer review as the primary reason for tension, Supovitz (2008) found funding to be the most prevalent tension between external power and school improvement. Teachers in my study also suggested how funding influenced school improvement.

8.4.2 Ring-fenced funding

Supovitz (2008) considered the American district of Pennsylvania's authority over school accountability and found tensions between the external body and the school. However, the tension Supovitz (2008) found was caused due to the districts power over funding and commissioning of services. This tension was also perceived by teachers in my study and can be considered under the category of Power. This is

because the power of those that determine how funding is 'ring-fenced' in schools was identified by teachers as causing tension in school. One teacher noted that:

> *'There is always loads spent on PE…because of the grant (Primary Sports Grant). It's crazy! We need books, and trips and things that make school fun, but we don't have any money. How can we make learning better for them (pupils) if we can only spend money on footballs'.*

Hart (1994) also suggested that there were tensions between school improvement and funding. In her study, that found teachers didn't fully engage with improvement strategies, she found this to be the case when teachers perceived that resources would eventually run out or become unavailable over time. Greany (2015) also identified that there was a tension between local authorities and funding for schools involved in improvement but that this had less impact than the lack of peer review.

In my study, other examples of funding being ring-fenced to support government policies were also used to exemplify the tension between what teachers wanted to spend money on and what they could spend the money on. Teachers discussed the use of the pupil premium funding:

> *'That isn't always the case though (as the primary sports grant). Pupil premium funding has helped us target money towards the important things'.*

Another teacher agreed and continued the discussion:

> *'Yes, that and the funding we got for the reading books. We spend that on things and that has meant that it can be planned. Sometimes we can change the plan, so it is flexible but if not, we would be able to spend it on anything and not on the things that we know make a difference'.*

As with many of the different tensions found, the tension between ring-fenced funding and school improvement is also demonstrated here to be an important one. Teachers recognise that national planning decisions based on areas of national importance in education, should direct spending decisions and are, as this teacher stated, the areas that make the most difference to pupils. This shows how this is a positive tension and is perceived by teachers to have a positive impact on pupils.

Another tension within the Power category was that of the tension between teachers' leadership roles and their teacher colleague relationships. This tension was also seen as a challenge and as having positive outcomes.

8.4.3 Leadership power and colleague relationships

Nehez *et al.* (2021) found that middle leaders (such as the teachers in my study, who can be considered part of this group due to their subject leadership roles and lack of senior leadership responsibility) impacted on school improvement in their study of Swedish schools. Leaders impacted in this way by involving their colleagues and developing a professional culture in their schools. Nehez *et al.* (2021) recommend that schools invest in their middle leaders, as this is a successful way of translating the school improvement targets and sharing them with the whole staff. While I propose that the teachers in my study would agree with the findings of Nehez *et al.* (2021) there were also some challenges associated with this part of their role. The impact of leadership decision making, power and hierarchy on teachers also created a tension between the power they obtained as leaders themselves, and the relationships they had with their colleagues. This is described by Katzenmeyer and Moller (2001) who recognised how teachers can be ostracized by their colleagues when they take on leadership roles. Similarly, Liebermann *et al.* (2000) found that teacher leaders could become isolated from their peers because of their leadership role. Teachers in my study describe how, in their leadership roles, they can find themselves in challenging conversations with colleagues that they have previously built strong working relationships with. The challenging conversation might be related to the poor performance of one of their colleagues or might occur when attempting to develop a new school improvement strategy. This means that the leader may need to make changes about how their colleagues typically work. This is described by teachers as an uncomfortable tension that impacts on the direction and success of school improvement.

> *'It is awkward if you get on well with someone, like if it was your planning partner, and they need to change something, or they are not doing something they should. I've had something like that before. Luckily it was OK, and he understood but it could have made things tricky'.*

However, teachers also described this tension in a more optimistic way, noting that because of the strong relationships they had with those they worked with, often improvement was made more quickly and in a more supportive way. This links with the theme of Relationships found after the initial coding of the interviews. This theme identified that the teams that teachers worked in were important instruments for school improvement. The tension between the role the teachers had as leaders

(usually of subjects) and the teams they felt they belonged to, always described a positive outcome for improving practise. This was a seen as a supportive way of working and leaders were often able to move improvement more quickly or gain a more immediate 'buy in' to new strategies or ways of working.

8.5 Practical solutions

A tension within the perceptions of school improvement was demonstrated when teachers discussed their preference to find practical solutions for problems or improvement requirements. Bickmore, Gonzales and Roberts (2021) also identified how practical solutions were sought by professionals in principal networking in America. They identified how networking between school leaders supported them in finding successful practical solutions to the challenges of improving a school. Tensions were discussed by teachers in my study in relation to finding practical solutions and funding, expectations, and the requirement of formal paperwork completion.

8.5.1 Funding

All teachers recognised the tension between the impact of funding to support school improvement foci and finding solutions that were achievable within the day to day running of the school and their classrooms. Often funding was seen to be limited or funds were needed more elsewhere in the school. This caused a tension when teachers tried to make improvements. For example, teachers indicated that some children needed more time or more support to access learning in schools or more hands-on resources or experiences to develop vocabulary. Muijs (2008) identified how funding was a key motivation for school staff embarking on school improvement strategies, suggesting that funding to support school resourcing is indeed a tension within school improvement. Teachers in my study perceived that school improvement was hindered by funding not being spent on, for example, improving the quality of reading materials or computing equipment.

This caused a tension, as teachers felt they had the answers but were unable, due to funding restraints, to fulfil these needs. Teachers described how funding was often

spent on activities that were not practical, without consultation with those who were required to complete the programmes.

One teacher stated that:

> *'I write a PE spend and say why we need to spend the money on different things. But there are some things we can't get with the money that we need more. Not just in PE. There are so many ways we could spend that money better on the children. It is so frustrating that we can't bend the rules and spend it on the things the children need, like books or fun things to get them interested in something'.*

This demonstrates the teacher's frustrations at not having full control over how the money is spent. Restrictions prevent the teacher from spending the money in the way she would choose within her subject, but she also recognises the needs of the children (possibly in her class) in all other areas. The primary sports grant (described here as the 'PE spend') restricts spending to aspects of sport and physical education provision. Muijs *et al.* (2004) recognised in their research review that resourcing can be a barrier to school improvement (also impacted on by professionals' capacity and ability to make good use of these resources). These restrictions, noted by teachers in my study, are given as an example of how funding can be a barrier to putting in place resources. These resources are perceived to improve outcomes that are of greater importance.

8.5.2 Expectations

The expectations placed on teachers were sometimes identified as being unrealistic due to their lack of practicality. This caused an additional tension for teachers. They describe striving to complete new strategies or ideas to the best of their ability. However, they also describe their perceived failure at implementing them. One teacher said:

> *'We all want to get it right and I think most of us have a go and do our best. It's not always easy to do something different or learn something new, like a new computer programme or scheme of work, but we do. Sometimes the expectations are ridiculous. Like there isn't enough time in the day to do that or how can we do that with a room of five-year-olds all doing something else. Sometimes we get asked for a TA (teaching assistant) to complete something and we haven't even got one!'.*

This tension was also identified as necessary to ensure practise was changed and all staff followed the same approach. The tension created by leaders implementing new strategies, testing them, and then following up when expected changes had not been made, demanded change. Reierson and Becker (2021) also found that teachers perceived that there was a challenge between the expectations of the change leaders were requesting and their experience of reality. This could be seen as mirroring the findings in this study, that teacher reality requires a practical solution, and this doesn't always mirror the expectations of the school improvement changes. Yurkofsky (2022) evidenced frustration in American schools where leaders implemented changes as a way of complying to expectations rather than as a response to need. Yurkofsky (2022) found that leaders either bridged the expectations of policies compared with school need, or they buffered the response to these strategies. The response to school improvement being one of compliance rather than need, could result in a lack of practicality around expectation, as identified in my study. In contrast, Muijs (2008) found that collaborative work on school improvement broadened the curriculum in some schools and offered more opportunities for career professional development (CPD). The findings of both Muijs (2008) and Yurkofsky (2002) appear to support the perceptions of teachers in my study, about needing to find practical solutions for external expectations placed on schools. This is because teachers are indicating that the expectations put on them from school improvement needs to be practical (rather than just complying with external expectations) and that this can be supported through positive collaboration with colleagues that they trust to support them in finding practical solutions. The higher expectations that Muijs (2008) identified in his case studies, related to collaborative work on improving outcomes for disadvantaged pupils. Teachers in my study also identified the tension of raising expectations, especially for poorer performing groups of pupils (such as pupils in receipt of the pupil premium funding or pupils with a special educational need or disability) and this ensured that improvements were made.

8.5.3 Formal paperwork

Two teachers described the tension between needing to complete formal paperwork and the 'real' discussion for improvement that followed. Teachers identified that they

need solutions to problems that they can manage, with the resources and time that they have. This sometimes conflicted with the formal paperwork activities that needed to be completed, such as in this example about a newly qualified teacher (NQT) now called an early career teacher (ECT).

> *'We do the paperwork. The NQT needs that completed to pass. So, we do that and then we talk about what is happening in class. What he really needs help with. The practical stuff. That can be the most effective way at improving what happens'.*

The teacher is insinuating that the formal paperwork does not itself improve practise or raise standards of teaching and learning. It is seen as something to complete before the real work begins. Once the official documentation is complete, the teacher or mentor can use their experience to offer the support to those less experienced on areas that the newly qualified teacher needs improvement or support on. This form of leadership is described by Leithwood *et al.* (1999) as informal, where expertise is shared and colleagues support each other.

Other forms of official paperwork are also referred to when discussing this tension. Another teacher describes the appraisal process as being a part of school improvement:

> *'We all have appraisal targets. The targets are related to the school development plan. Whatever is on there. Then in appraisal we try to think of actions. So, ways we can chieve the target in class. Things we can actually do (laughs) not, not do'.*

Here the teacher is describing how appraisal processes are followed, using the school development plan in a formal way. The teacher described this as an exercise that needs to be completed following a uniform method. While the targets and development plan may not be seen as achievable or useful, the teachers then adapt them to form suitably practical targets that can be reflected in their classrooms. Action planning was seen as another example of how expectations around paperwork did not impact in a practical way on improvement strategies. One teacher discussed her experience of using action plans to lead English.

> *'I write it (action plan) usually in July, sometimes September and then don't look at it again. I know what I need to do, and sometimes other things happen that need attention. I'm not going to waste my time writing all of them down and saying what I did. That would take more time than just doing it. They're a paper exercise really. Not very practical in a busy school'.*

A conflict is demonstrated between what is expected to be completed and the practical application of this leader's role. The leader has confidently found a solution but not recorded all her actions and areas for improvement. The teacher reveals how she does not refer to this paperwork as a working document, as it does not support her in a practical way. It could be argued that this reflects her significant experience as an English subject leader and that the action plan is a device that is unnecessary. However, without an understanding of the teacher's impact on improving English across the school and without reflecting on the formal paperwork that is a requirement of her role, it is not possible to see the impact of her approach. However, it is important to recognise that there is a tension between the formal paperwork expectations and the perceived impact it has on school improvement.

8.6 Striving for equilibrium

Teachers describe how there is a sense in schools of trying to reach a golden standard of excellence, a place where everything is improved, and each part of the system is working at its optimum level. However, there is also a very clear understanding that this goal is unreachable. Striving to reach a point at which the equilibrium in school is settled, causes a tension in the school improvement process. This tension is a positive one and perceived as necessary to provide the best educational experience as possible for the pupils. However, there is no doubt that teachers reflect on this constant change, as challenging. They recognise how striving to be the best they can be at everything can be tiring, stressful, and has caused some teachers to leave the profession. In one discussion, a teacher shared that she had felt stress at certain times of the year, when things seem to continually change. Another teacher responded:

> *'(I feel the) same. At times it can get you down, changing things or starting new projects. Even just knowing that something isn't good enough, like the data or the children's books. But we just do it don't we. That's what teaching is. We don't say no because we want the best for them (children)'.*

Morris and Ferguson (2020) detail the stress teachers feel with the constant change in school, caused in part, by school improvement. They describe how strategies for improvement are causing teachers to burnout and conclude that leaders need to be aware of the daily work practises that teachers are involved in before offering their

vision for the future. While this is important, it could be argued that the leaders are also under pressure to make changes and therefore it is important to get a balance between this and the pressure that teachers feel. The suggestion that constant change has a negative impact on teachers is supported by Rierson and Becker (2021) who conclude that excessive change can cause 'fragmentation, stagnation and initiative fatigue' (Rierson and Becker, 2021, p. 124).

Teachers also viewed the constant drive to improve or reach a place of excellence as a positive aspect of school improvement. One teacher noted that:

> '*Each year we write a plan about what we want to improve and then we present this to the Governors. We can then answer questions on why we have chosen these and sometimes this is clear on our plans and then we say what we are going to do. It is what you said before that everyone is trying to have everything right. It is a positive thing because I have known schools just stop, once Ofsted is out of the way. Then nothing improves and they get left behind. You hear about schools going from Outstanding to Requires Improvement or worse, don't you? I think that is what happens. They stop trying to improve and think they have got everything right. Maybe they did have in that moment in time, but things change, and the children certainly have (laughs)'.*

The teacher identifies the benefits of striving to get 'everything right' but acknowledges that a belief that a school has 'everything right' can also cause complacency. In striving for equilibrium, or continually striving to improve, schools develop momentum to improve, and this impacts positively on the pupils. The teacher recognises that the education system changes but also recognises that this striving for equilibrium is a response to the changing needs of the pupils. Again, this demonstrates a positive tension in the school improvement drivers.

It is clear therefore, that teachers recognise the need for schools to continually strive for equilibrium however, they do not appear to conclude that this an attempt to achieve perfection. The teachers are aware that continual change is necessary, therefore perfection in education is not expected.   A teacher offered this view when she discusses in the focus group how, when working with children, getting things right is not possible:

We can't get it right all the time – we work with children!

The teacher recognises the complexities associated with working with children and families. This is an accepted part of the role and makes reaching a state of equilibrium, at the very least, a challenge.

Striving for equilibrium is perceived by teachers as a necessary tension in school improvement. It can ensure that schools evolve and respond to the pupils and needs of the system and community it supports. However, the teachers also recognise the difficulty of working within a system that strives for equilibrium and is constantly changing and developing. The tension therefore demonstrates the need to consider how much change and development the teachers, leaders, and a school can take.

8.7 How the key themes supported the formation of tension categories

This chapter has described how the key themes, identified in the analysis of the semi-structured interviews, supported the development of the categories of tensions. Table 9 below shows the relationships between the themes and tensions.

Themes	Tensions

Hierarchy – Authoritative bodies
      Individuals
      Teams
	Credibility
	Power
	Striving for
	equilibrium

Experts – experts within schools
      external experts that support identified improvement
      external experts identifying areas for improvement
	Credibility
	Power
	Practical solutions
	Striving for
	equilibrium

Training – hierarchical decisions the impact of training on the school and classroom	Credibility Time
Clarity – Starting points Impact on pupils	Credibility
Dissipate – Opportunities to revisit Legacy	Time
Trends – social media educational community	Credibility

Relationships – formal and informal
      leadership
      teams
      other stakeholders
	Credibility
	Time
	Power

Table 9: How the key themes supported the development of the tension categories.

8.8 Tension subcategories and their relationships to the five tensions

Figure 14 illustrates how the subcategories form the five tensions. Each tension is surrounded by its subcategories. The exception to this is the 'striving for equilibrium' tension that does not have any subcategories used to define it.
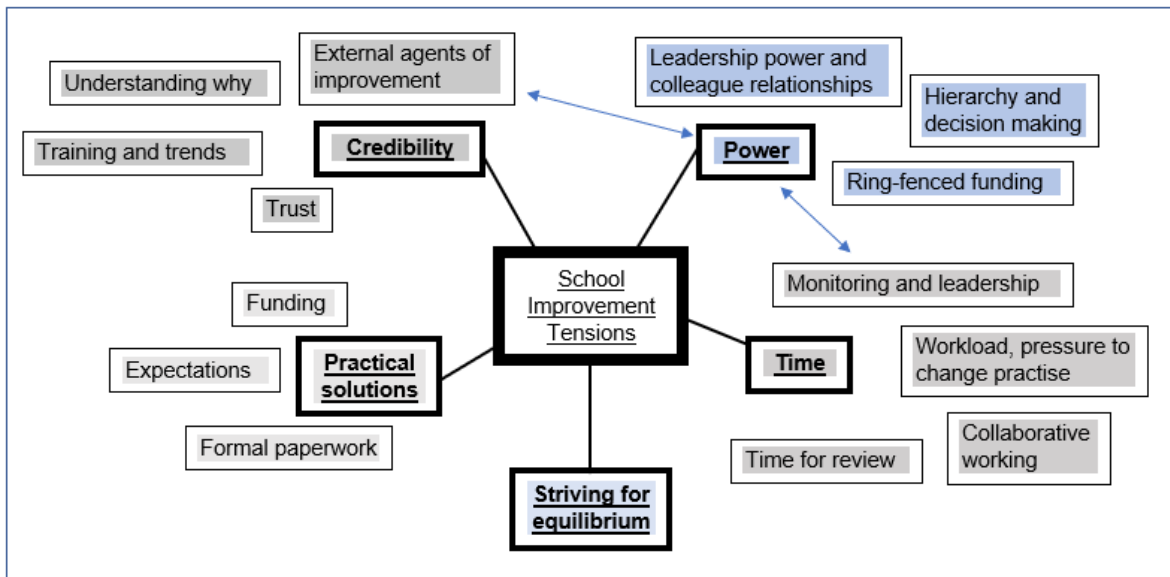
Figure 14: Tensions and their subcategories.

The subcategory, 'external agents of improvement', is illustrated with a blue arrow directed at the Power tension. This is in recognition of how teachers identified the power and credibility held by external experts. Similarly, the 'monitoring and leadership' subcategory is illustrated with a blue arrow linking it to the Power category. This identifies the links (suggested by teachers), between teachers' own leadership roles and the power this gives them in bringing about change within the school.

8.9 Findings related to the research aim

The aim of this study was to understand teacher perception of school improvement. Teachers perceive school improvement through tensions that are caused by changes to policies and practises. The tensions are also the reason for these changes to policy and practise and impact both in a positive and negative way. The credibility of professionals and hypothesis for improvement, the time to review and complete their roles and responsibilities, the power to make changes to the school system, and the challenge of finding practical solutions, are all tensions that teachers perceive that they negotiate. Additionally, teachers perceive that schools are striving for excellence, or a state of equilibrium, where no further changes are needed to be made. Of course, this state is never reached, and this creates a tension that is both perceived as positively impacting and negatively impacting on the school improvement process.

8.10 Chapter eight conclusion

Teachers perceive there to be five overarching challenges in school improvement. These challenges can be better described as five tensions. The tensions are described by teachers using examples. These examples form subcategories for each tension. The challenges are described as tensions because they are often viewed as having both a positive and negative impact on teachers, their colleagues and school improvement. The word tension can also be used to describe something that impacts in a positive and negative way. The five tensions are perceived by teachers to motivate and encourage change, but also place barriers that hinder how the school might improve.

Throughout the discussion in this chapter, teachers discuss how the tensions are both a challenge and a source of motivation. This is indicative of the perception that these tensions are needed to ensure that the school system is challenged to work at its optimum, and that the tensions motivate schools to continually improve the provision for pupils and families.

The tensions identified in the data demonstrate how schools are constantly balancing the challenge between everyday working practises and expectations of changes introduced to improve them. Teachers appear to navigate these tensions and understand the need for them within the ever-changing landscape of education. While, for the most part, teachers and schools appear to manage these tensions well, the question could be asked, how much tension can a school system take? Should we consider whether the concerns around teacher retention and schools requiring improvement are in fact a result of the balance of tensions being poorly managed? In the case of poor teacher retention, should we also consider whether there is also a poor balance between the tensions that are causing stress and unnecessary workload? In the case of poorly performing schools, is it that there isn't enough tension in the system to make the necessary changes to ensure the school continues to perform well? Tension in the system would therefore appear to work well for some and not others.

Chapter Nine: Findings and analysis – Complexity Theory

In this chapter there will be a discussion of each of the perceived teacher tensions and their relationship to Complexity Theory characteristics. The chapter will conclude by considering why this is a purposeful observation and important for future school improvement planning.

9.1 The relationship between the 5 tension categories and Complexity characteristics

Each tension has been linked to a characteristic common in the Complexity literature (and described in chapter 3). The tensions were linked to the characteristics that were most prominent within the category. This is illustrated in Table 10 below. The relationship between the tensions and the Complexity characteristics (illustrated in Table 10) will be described in 9.2. The discussion will include why the relationship between the tensions and characteristics are important for school development.

Tensions	Complexity characteristics
Credibility	Agents
Time	Temporality Connectivity
Practical solutions	Self-organisation
Power	Loose Coupling Agents
Striving for equilibrium	Equilibrium Bifurcation point Temporality

Table 10: Where Complexity Theory characteristics can be identified in the tension categories.

Some characteristics have not been linked to the tensions and it will be important to consider why this might be. The latter part of 9.2 will then consider the absence of additional Complexity characteristics (not identified in Table 10) and whether they remain relevant to school improvement.

9.2 Credibility and Complexity Theory

Complexity Theory describes systems has having subjects or agents within it. In a school this could be the school stakeholders, and may include staff, parents, school governors, pupils, consultants, and school improvement advisors. The agent characteristic, described by Complexity theorists, closely links to the credibility tension that was identified by teachers. The link between the agent characteristic and the credibility tension has been made, due to the ways in which this tension was exemplified using the relationships between people (or agents) involved in school improvement. For example, when a teacher discussed Safeguarding and the school Governors, she said:

> *'They come in each year and meet with staff. So, if they are responsible for Safeguarding, they meet with the DSL (Designated Safeguarding Lead) and everything like that'.*

The teacher is describing the relationship between a school governor (one agent) and the school staff (DSL). The DSL is expected to meet with the school Governor who is responsible for Safeguarding. In this instance the agent is perceived to be credible as the teacher does not specify otherwise.

Teachers feel a tension between the internal and external experts when they identify areas in the school for improvement. These relationships are described as important, as is the trust between colleagues, another way that teachers illustrate this tension category. The credibility of professionals working with the school and the credibility of any new trends (introduced to the school by agents), are also tensions that are identified.

How the agents are organised was also identified by teachers, with a recognition that the credibility of some staff caused teachers to identify them as supportive in the school improvement process. This credibility encouraged teachers to self-organise and work more closely with the credible agents. This shows the importance that teachers place on their relationships with others and how their interaction with key personnel impacts their response to change and improvements in their school. It also shows the importance of self-organisation in the change process, that not all successful change is directed by a leader or expert, but by the teachers themselves. Teachers share the responsibility of improvement, adapt their practise, and

sometimes adapt the expectations of leaders, to ensure that improvement is manageable and effective.

Agents form the school system. This was no more evident than in the recent pandemic, when school buildings closed for some, and yet the school system remained. It is no surprise that agents are identified by teachers as vital in a school, and this is mirrored in Complexity Theory, with agents being key to a complex system. Closer relationships, or in Complexity terms, coupling, occurred when agents were credible, as described in the Power tension.

9.3 Power and Complexity Theory

The power given to agents in the system because of a perceived hierarchy of leadership, resulted in agents relating to each other in different ways. This can be described using the Complexity characteristic of loose coupling.

Teachers described decisions being made without them being consulted or their opinion requested. This was perceived to be a tension because it was the teachers and support staff who were perceived to be the ones making the changes. This could be evidence of loose coupling, where there is a distance between the decision makers and those taking the school improvement action. Loose coupling also created a tension when decisions about funding (where it is ring-fenced for specific aspects of the school) were made, with the loose coupling being between the decision makers and the staff working in schools.

Hierarchical decisions and responsibilities created tensions between the teachers in their roles as subject leaders, and their colleagues. The teachers (as subject leaders) needed to make decisions about how to move their subjects forward. This decision making and leadership role sometimes challenged the strong relationships teachers had with their colleagues. This tension was felt less between the teachers (as subject leaders) and those colleagues they felt more loosely coupled with. Teachers perceived they felt more comfortable challenging those they were loosely coupled with and were therefore more able to offer improvements or changes to their loosely coupled colleagues. However, this tenson was seen as more advantageous when teachers needed to implement change with colleagues they were more closely connected to, as this was seen as an opportunity to bring about rapid change. The

closer connection encouraged teacher's colleagues to be more motivated and responsive to change. In this example, loose coupling had a less positive impact on school improvement than when teachers had to challenge poor performance of colleagues.

9.4 Practical solutions and Complexity Theory

The tensions described in the practical solutions category, demonstrated how agents self-organised. Self-organisation is a characteristic of Complexity that describes how agents adapt and change how they relate to one another.

Teachers recognised that there were formal aspects of the school system that were necessary. These included, completion of formal paperwork, expectations placed on the system for improvement, and funding restrictions. However, there was a discrepancy between these requirements and the expected outcomes of improvement. Teachers described how they needed to find practical solutions despite the restrictions placed on them. Often this was achieved through self-organisation. For example, teachers who were required to formulate written plans or complete formal paperwork did so, while considering ways in which they could adapt them to everyday situations in the school or classroom. A teacher recognised, that a tension was created when the formal completion of newly qualified teacher paperwork was required (ensuring high standards were achieved), there was a need for the newly qualified teacher to also have a separate conversation about the practical aspects and ideas to support their development in their first year. This caused the teachers to self-organise and work together in a less formal way to find practical solutions.

Finding practical solutions to problems was also described when teachers discussed how they negotiated the expectations of a school development plan (written by a school to identify expected targets and plans to achieve them). Teachers self-organised by adapting and finding practical ways to implement the targets or expectations. Teachers often self-organised and worked together less formally to achieve this.

Similarly, while funding allocation was perceived to be a positive tension found in schools, it was also seen to be a barrier to improving other aspects of the school.

This was a situation where teachers self-organised and found practical solutions to the funding problems they perceived to be evident in the system.

9.5 Time and Complexity Theory

Time is described by Complexity Theory as temporality. The temporality characteristic is therefore clearly identifiable within the time tension category. The time devoted to school improvement impacted on teacher workloads, the opportunity to reflect on training, opportunity for monitoring and leadership, and working together with others. Teachers perceive that school improvement takes place over time, but there are tensions that do not always acknowledge this need for temporality. This creates pressure that was perceived as having a positive and negative impact on school improvement.

In addition to temporality, the Complexity characteristic of connectivity, was also evident. Teachers perceive that the connectivity formed between colleagues, when working together on school improvement, was a successful response to developing an area of the school. Finding time to develop this connectivity was perceived to be a tension, as was having the time to connect with colleagues when delivering feedback from monitoring. All the teachers revealed their need for connectivity with each other in their response to school improvement.

9.6 Striving for equilibrium and Complexity Theory

A system in equilibrium is how Complexity describes a system that is in a state of balance, without change. However, as Complexity describes, systems do not stay in a state of equilibrium as, due to a bifurcation point (a point at which something happens to cause the system to change) the system changes and adapts. Complexity determines that all systems need to change and cannot stay in a state of equilibrium.

A perception of teachers, identified in the data, is that schools are constantly striving to be in a state of balance, where everything is at its optimum and no changes are required. However, the tension occurs, as teachers also recognise that this state cannot be reached. This demonstrates a way in which Complexity can be a useful

theory in considering the challenges associated with school improvement. If the state of equilibrium cannot last (as Complexity suggests and the teachers recognise) then this a tension that cannot be overcome. This is particularly pertinent when education is recognised to be a continually evolving and changing sector.

An area of the school might be considered in a relative state of equilibrium (recognising that smaller changes happen throughout the school day that may alter this state of equilibrium in a small way) until a bifurcation point occurs. This might be in a core (English, maths, and science) or a foundation (for example, physical education, art, or modern foreign language) subject, where the policy and procedures have remained the same for a year or more. Teachers describe a range of ways in which the bifurcation point impacts on the equilibrium, as well as having a clear understanding of where or who has stimulated this point of change in the norm. Some of the ways teachers exemplify bifurcation points (that cause changes to be made) are, Ofsted inspections, monitoring, or changes to government policy. A bifurcation point can cause a positive tension to be created, ensuring that schools continually adapt to new research, policy initiatives and societal needs. However, bifurcation points are also perceived as challenging, with teachers recognising that changes to practise can be difficult.

The characteristic of temporality can also be identified in this category and indicates the importance of time in the school improvement process. This is unsurprising, as school improvement takes time. The time pressures in schools are also recognised by those working in education. However, this characteristic also indicates emergence of change over time, and often, with the quick pace of change in schools and in education, there is not the time devoted to allowing improvement to emerge. Teachers perceive that we change the focus of strategies too quickly, often before they have had time to embed in the system. The challenges felt by being in a state of constant change are described as stressful, and the school improvement literature, including Morris and Ferguson (2020), acknowledge that teachers can feel burnt out by this process. Therefore, the characteristics of temporality and emergence are important to consider. Teachers identify that some of their colleagues eventually left the profession due to this constant change. So, it is possible, that while some teachers can respond positively in the short term to constant change, this might not be the case over time.

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9.7 Characteristics of Complexity not identified in the tension categories and their importance to the school improvement discussion

A discussion that considers why the characteristics of Complexity not prominent within the tension categories will now be offered. Examples are offered as to where these characteristics were hinted upon but not eminent in the analysis.

I would argue that the most surprising characteristics, notable by their absence in the findings of this study, are non-linearity and unpredictability. It might have been expected that teachers would highlight how school improvement does not occur in a linear way and that school improvement happens in unpredictable ways (as well as in planned responses in school development plans). While teachers did discuss the unpredictability of schools when this question set was used in the interviews, it was less evident in the tension categories. It could be considered that this demonstrates the extent to which teachers expect unpredictability, that it has become the norm in their working practises. It may also indicate the extent to which they recognise how schools are measured in a linear fashion, despite knowing that there is debate surrounding the concerns with these reductional methods. An example of where this could be considered the case, is in the way that teachers acknowledge and accept the testing of young children to be an unsatisfactory response to measuring child development. They know instead that development does not follow a linear path and therefore testing offers only attainment in a moment in time. However, teachers accept this reductional response, understanding that it as a process that schools must follow. Similarly, they accept the linear practise of school development planning but understand that this is not always mirrored in their lived experience. This acceptance and understanding of the issues surrounding non-linearity in schools, may indicate why this characteristic was not notable in the final tension categories.

Shaked and Schechter (2020) studied principal's leadership in Israel and identified the use of linear perspectives as a way of developing new policy initiatives in schools. They regard this as simplistic due to the complex nature of schools and the growing complexity that is needed to describe schools and the changes they undertake. Shaked and Schechter (2020) also identified how these simplistic

models were being used by principals to address more complex problems. This indicates evidence of Complexity reduction, where a smaller or more simplified response is provided in acknowledgement of a bigger, more complex problem. Complexity reduction was absent from the school improvement tensions, despite an understanding by teachers that they were often responding, through school improvement strategies, to wider societal challenges. Teachers did not identify this as a tension that either supported or hindered school improvement. I argue that this is evidence that teachers accept addressing societal challenges through education as part of a school and teacher's role.

Feedback loops were also a characteristic not prominent in the tension categories. A discussion about trends was identified in both the key themes and in the tension category, however only by two teachers. More experienced teachers discussed how these trends were often on a feedback loop, that sometimes strategies have been seen and trialled before. I would propose that because teachers who were involved in the interviews and focus group had been teaching for differing numbers of years, and this had therefore not been the experience of all the teachers. Those who had been in education for less time may not have experienced the cyclical aspect of school improvement that the more experienced teachers identified with. This could explain the absence of this characteristic in the tension categories. However, it was noted that teachers did consider the opportunity to revisit strategies in an evaluative way, and this could be considered a type of feedback loop. Potentially, this is linked to the temporality characteristic that was prominent in the tensions, as time restraints are identified as a tension when considering opportunity for reflection and understanding why strategies may need revisiting.

Emergence is a characteristic that is not prominently identifiable but is evident to a lesser extent in all the tensions. This is because school improvement, relationships, practical solutions and striving for equilibrium, emerge over time. Teachers did not specifically discuss the emergence of improvement (except when asked as part of the phased interviews) however, they suggested its presence in their descriptions of how strategies evolve over time.

The whole being greater than the sum of its parts, is a characteristic of Complexity not identified as relating closely to any of the tension categories. It might be

expected that teachers would consider how some school improvement strategies did not improve their schools. In Complexity terms this could be described as teachers noting how the whole is less than the sum of its parts. Notably, this was not the case. Similarly, teachers did not always perceive that the improvement strategies created opportunities beyond what was planned (that the whole was greater than the sum of its parts). This was a specific focus within the phased interviews (and formed one of the question sets) and at this point in the data collection, teachers were able to offer examples of where this occurred. However, the whole as greater (or less) than the sum of its parts, was not a prominent feature when the data was analysed, and the tensions emerged. I would put forward the idea that this does not mean that strategies don't allow for improvement beyond their expected outcomes, but that by not recording and reflecting on theses outcomes, teachers do not perceive them to be relevant in the school improvement discussion.

9.8 Chapter nine conclusion.

Within the five school improvement tensions, the Complexity characteristic of agents (stakeholders) are important when considering the credibility of personnel working to improve the school, and the characteristic of self-organisation is evident in managing the tension of finding practical solutions to school improvement expectations. Loose coupling is evident in the power tension and temporality is a characteristic associated with the school improvement process and the time available for agents to connect with each other. Teachers are aware of the bifurcation points that cause a disruption in the equilibrium and often lead to school improvement.

While emergence is not a category identifiable in any one tension, it is evident in all the discussions about school improvement, that improvement emerges, or relationships emerge, over time. Similarly, non-linearity is not a focus of the tensions. The reason provided for this is that teachers have become accustomed to the non-linearity of schools being measured in a linear way (through, for example, testing) and are therefore less likely to discuss it as a tension in school improvement. Feedback loops are also not a focus of the findings; however, more experienced teachers do discuss this within the debate about trends for improvement that are recycled and reused.

The comparison between Complexity Theory characteristics and the perceived teacher tensions has been useful in highlighting the challenges teachers experience when developing their practise. It is now important to consider what implication this has on future implementation of school improvement strategies in schools. This will be considered in chapter 10.

Chapter Ten: Discussion, conclusion, and implications

Chapter 10 will consider the key findings in relation to the research aim and objectives. The chapter will then discuss the strengths and limitations of the methodological design of this study and the generalisability of the findings. The chapter will then consider the implications based on the characteristics of Complexity, the potential implications for policy and practise and any impact this will have on my own professional practice. A conclusion will then be offered.

10.1 Key findings in relation to the research aim and objectives

Reflections related to the study's finding and the research aim and objectives will now be discussed.

10.1.1 Research aim

The aim of the study was to understand teacher's perceptions of school improvement. Teacher perceptions were obtained using semi-structured questionnaires that used Complexity as a framework for questioning. Analysis of this data enabled the perceptions to be discussed at a focus group and clarification and further data was obtained. The emerging theory showed that teachers perceive there to be tensions within the school improvement process and these were discussed in chapters 8 and 9.

10.1.2 The research objectives

To respond to the research aim there were four objectives for the study. How the study fulfilled these objectives will now be summarised.

- Objective 1: To develop a methodology that bridges the gap between the thematic response of Grounded Theory and responding with a predetermined theoretical structure.
- Objective 2: To develop a methodological approach that used the characteristics of Complexity theory in its data collection and initial analysis.

The study was iterative in its approach. The study used the emerging theory to make decisions about future data analysis and used open, *in-vivo* (Charmaz, 2006) secondary coding. While these approaches align with a Constructivist Grounded Theory approach, there were also significant differences. In Grounded Theory the direction of the interview may not be pre-determined. The researcher will take decisions about the direction of the interview as it progresses. This study took an alternative approach and pre-determined the questions, based on grouping of Complexity characteristics. This approach offered a predetermined theoretical structure using the lens of Complexity to support the emergence of the data.

In Grounded Theory, open coding would be used throughout to ensure the theory is enabled to emerge from the data. However, in this study, thematic coding was used in the form of Complexity characteristics. This directed the analysis and future data collection, ensuring that each Complexity characteristic was focused on in the interviews.

- Objective 3: To identify characteristics of Complexity theory in teacher perception of school improvement.

In the interviews, each characteristic of Complexity was grouped into interview question sets. Each teacher was initially questioned using the agents question set and then decisions were taken in the following phases as to which Complexity characteristic question set would be useful to the emerging theory. This ensured that at the interview stage, Complexity characteristics were identified and responded to.

In the initial coding, Complexity characteristics were used to provide a framework for analysis. This supported the development of the initial key themes. These key themes supported the development of the theory (five tensions). Once the theory had emerged and the teacher perceptions had been categorised into five tensions, the characteristics of Complexity were used to gain further understanding and implications for practise and policy. This demonstrates that the objective of enabling the use of Complexity Theory to support the emerging theory of teacher perception of school improvement, was used at every stage of the study.

- Objective 4: To expose teacher perception of school improvement.

Teacher perceptions were gained from semi-structured interviews and a focus group discussion. Key themes and then key findings were identified. The key findings demonstrated how teachers perceive five tensions in the school improvement process. These are, Credibility, Power, Time, Practical solutions and Striving for equilibrium. These were then aligned with Complexity characteristics to further understand these teacher perceptions.

10.2 Methodological strengths, limitations, and generalisability

The methodology attempted to offer a response to the challenges felt by those attempting to use Constructivist Grounded Theory as an approach for the first time. Where this had been problematic for me in my master's thesis, was in the lack of structure (deliberately) used by Grounded theorists in the early stages of research and data analysis. My study attempted to bridge this gap and offer a theoretical structure to support the initial stages in the research process. This structure was provided by using the lens of Complexity Theory to develop the approach to research, the research instruments, and initially analyse the data (initial coding). This was a successful way of beginning the research and initial analysis. The structure provided a starting point and direction to initially move forward with the research. There were other advantages to offering a structure to the instrument design and analytical process. This was due to the theoretical lens of Complexity and how it describes systems. I would propose that Complexity Theory is a successful way to describe how schools are run, how they change and how elements of the system interact with each other. The use of this theoretical lens ensured that all aspects of the school system were considered in the initial data collection. This was achieved through the interview content being structured using Complexity characteristics. Additionally, Complexity Theory offered a strong theoretical structure with which to begin analysis of the data, allowing patterns to emerge. Providing initial codes in the form of Complexity characteristics gave me an opportunity to familiarise myself with the data and begin to see where secondary codes and theory emerged.

Another strength of the methodology was the non-linear approach. This approach was sympathetic to both Constructivist Grounded Theory and Complexity Theory. In

taking a non-linear approach when identifying the question sets for use in each phase, I was able to respond to the theory as it emerged, while retaining the structure that was needed to ensure the focus remained on school improvement. This approach allowed for flexibility, enabled me to engage with the data and use the data it to inform the later phases of data collection. Due to this approach, I was able to demonstrate to the teachers that I was responding to their views and showed that their opinions were being listened to and were useful to the theory. This was due to each question set informing the questions in the next phase, so that I could make direct references to what the teachers had discussed previously. I was able to demonstrate that I was interested to find out more about what they had previously discussed, by linking the current questions to the examples they had given (albeit from using a different perspective or characteristic). This was in part, achieved by implementing semi-structured interviews. Semi-structed interviews were not restrictive as I was able to be spontaneous and ask questions that were not predetermined. This ensured I was aligning the research instruments with Complexity Theory (that rejects boundaries and presents spontaneity as vital). This approach allowed the theory to emerge in a way that is sympathetic to Grounded Theory.

The interviews enabled me to consider individual perceptions, but the focus group allowed a consensus to be considered. The focus group also ensured that I was able to 'test' the emerging theory and clarify points that were not evident up to this point. To confirm that I had interpreted, for example, the hierarchical aspect of school improvement correctly, was useful. The focus group also gave me opportunity to consider characteristics of Complexity that were not present in the emergent theory and consider why this might be the case. The continued use of the theoretical structure ensured that I was able to engage with many aspects of school improvement.

However, not all aspects of school improvement were considered within this study, and this is a limitation. Possibly due to the focus on Complexity and the key themes that emerged because of using this theoretical structure, there was little discussion about school improvement plans (sometimes called school development plans). Although mentioned when discussing formal paperwork, and often referred to, no meaningful discussion was focused on the formal record of school improvement that

many schools employ. This is a limitation, as these plans are so widely used in the school improvement process. I suggest that it would therefore have been enlightening to consider what the teachers perceptions were about these plans. Additionally, it might have been the case that other formats of recording school improvement are in place and this study did not enable this information to be brought to the forefront.

This also indicates another limitation to the study, the lack of practical solutions. School development plans are an integral part of the school development journey and teachers perceptions may have been useful in offering a practical response to this formal recording of school improvement. In the findings, teachers perceived a tension in school improvement related to finding practical solutions. A limitation to this study is a lack of response to the practical use of school development plans. This highlights how Complexity Theory has its limitations in a response to school improvement and was not an efficient way to expose the practical requirements of teachers. This was also a limitation of the research aim and objectives, that they did not include an opportunity to develop a practical response to the findings of this thesis.

This thesis contributes to the literature by offering new knowledge about teacher perception of school improvement and the tensions the teachers describe. However, as all the teachers were located within a small area of England (over two counties) this may have impacted on the data and generalisability of these findings. Alternative local authorities and teachers in differing geographical locations, may use different approaches to school improvement. Therefore, if this study was repeated elsewhere, different tensions could be perceived. I also acknowledge that there were twelve teachers whose views were recorded. This is a small sample, and were the sample increased, the findings may also differ. This reveals that the findings cannot be generalised. Instead, the tensions described are offered as a discussion point and should be taken in context when considering an approach to school improvement.

In addition to being considered a strength of the research, a limitation in this study might be my previous knowledge and experience as a school leader, and my previous interest in identifying Complexity Theory characteristics within educational

research. This is because of the consequential impact I had on the data. This is no more prevalent than in the search for the Complexity characteristics, the whole as more than the sum of its parts, and school improvement as a non-linear process. Throughout the study I indicated that both characteristics would be perceived as occurring in the teacher descriptions of school improvement. However, they were only exposed after direct questioning in the interviews and in the focus group. Teachers did not initially offer examples of where school improvement strategies improved more or less than they set out to, and this was a surprise when I completed the data analysis. Similarly, I had expected teachers to recognise that school improvement is not linear. However, this was again not offered without direct questioning. This demonstrates how my experience as a school leader and education professional will have directed the questioning and data collection due to my previous knowledge and experiences on the subject.

It is possible however, that because teachers are very familiar with school improvement being measured and described in a linear way, the findings of this study could reflect how teachers have accepted this trajectory as being unsuitable and do not, therefore, question it. The findings could suggest that teachers do not consider other outcomes as being important to share unless specifically asked, because of how school improvement records are reductional: that this is the accepted way of thinking. Alternatively, it could be, that school improvement follows a more linear path than I have determined in my literature review. Another conclusion could be, that the lack of clarity around outcomes (found throughout the study) could be the reason for teachers being unable to identify additional outcomes of strategies or describe when strategies are less successful. It is important to note that some strategies were perceived to be successful or unsuccessful but there was no clarity in the description, so the characteristic, the whole is greater than the sum of its parts, was hard to identify.

I am also mindful of a limitation created due to the way in which the interviews were carried out. They all took place in school settings, where teachers may have been less comfortable to share negative perceptions about their colleagues, schools, and school improvement. A limitation could also be that the perceptions about school improvement only considered the teacher views and not the school leaders and the children themselves.

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Complexity Theory describes systems that are unpredictable. If looking through the lens of Complexity, as this study does, this would also indicate that the findings of the thesis cannot therefore be generalised because of the unpredictable nature of the school system. Complexity theorists would argue, that due to the unpredictable nature of schools (and Complex systems) the findings of this study could therefore not relate to another school system. However, I would argue that some of the examples given by teachers in their explanations of the tensions would be recognised by teachers all over England. For example, the tensions within the expectations of Ofsted, ring-fenced funding such as the primary sports grant, and the expectation for schools to change and constantly improve. For this reason, I believe that learning can be taken from the findings, provided schools continue to respond to the unpredictable nature of the system.

10.3 Implications from the perspective of Complexity.

I propose that Complexity Theory has been useful in describing schools and describing school improvement. This has an implication on future practise because Complexity is not currently used to support the description of school improvement. It is possible that Complexity may offer a more suitable response than the current reductional descriptions schools are using. Allen, Evans and White (2021) also support this view, advising that school leaders need a methodology for school improvement that recognises the complexity of the process. They conclude, that oversimplifying the processes of improvement and change, encourages a system that excepts the adoption of new strategies without challenge.

When teachers demonstrated disconnect from the wider issues impacting on school improvement, Complexity Theory was a useful tool in which to explain teacher perception. In recognising characteristics absent in the school improvement discussions, Complexity Theory has illuminated an important learning point. For example, in identifying that Complexity reduction was absent from the interviews key themes, I was able to confirm in the focus group discussion that this characteristic is present in teacher perception of school improvement. The focus group demonstrated how teachers understand that they have role to play in solving the challenges in society related to the pupils they work with. They recognise that the

bigger problems of society are attempted to be solved by responding with many smaller interventions (that are often included in school development planning). Teachers also recognise that these problems cannot be solved, yet they continue to strive to solve them. An example of this, is where teachers discussed working to 'fill the gaps' in vocabulary of pupils just starting school. This is because of a wider societal problem, where it is suggested that we are seeing children spoken to less with some adults using technology in place of conversation with very young children. This is causing pupils to start school without the vocabulary and speech and language skills that would be expected for their age. This is an example of Complexity reduction, identified using the theoretical structure.

I have proposed that the reason Complexity reduction was not identified in the tension categories was that teachers have accepted this as their role and do not question this, or their, position. Complexity Theory has therefore highlighted a potential implication for the future, that education should be questioning this narrative. While, as Allen, Evans and White (2021) argue, policy makers are acting with good intentions, should policy makers be considering how Complexity reduction is a way of describing how schools are attempting to solve societal challenges with little chance of solving the larger problem? If this is the case, then Complexity has identified an area that needs further consideration.

Similarly, using the theoretical structure of Complexity, identified the absence of non-linearity in the five tensions. This appears to demonstrate that teachers do not recognise the non-linear outcomes of school improvement. However, I would argue that school improvement is not linear, and I would suggest that teachers are aware of non-planned outcomes, setbacks, and unpredictability, in the school improvement process. This was supported by the focus group when the teachers discussed how not all aspects of the school improvement journey can be predicted because of the non-linear lives of the pupils. Should authoritative bodies, such as Ofsted and school leaders, be considering how to better represent the outcomes of school improvement, through a recognition of the non-linear system?

Complexity Theory also illuminated how the agents in the system support and challenge each other, however, this is contrasted with the barriers that are in place when an agent is not credible. Offering opportunities for agents to self-organise is

offered by Complexity as a way of agents forming informal connections. Teachers indicate that in some instances these informal relationships are conducive to producing opportunities for rapid change in the system. This opportunity could be exploited by school leaders. However, teachers also offer an alternative view and provide examples of where these informal relationships can provide a challenge to subject leaders fulfilling their roles. Teachers recognise however, that informal roles are often more effective at improving schools than more formal relationships. Complexity Theory has therefore highlighted the importance school leaders should place on connectivity of agents in the system.

Self-organisation can lead to loose coupling. Complexity Theory suggests that agents in a system need to be coupled or connected. Teachers perceive that there are times when being loosely coupled with another agent is both a positive and negative response to school improvement. This is dependent on the differing requirements of the strategies. Complexity is highlighting the requirement for different responses to teacher connectivity that relate to the differing requirements of the system.

Teachers are aware of the bifurcation point of improvement. Clarity around this and a transparency about the reasons for the change, could be considered important in the process of school improvement. A similar clarity is also needed when considering the characteristic of temporality. Ensuring that the temporality of a strategy is discussed and shared with teachers, is important in ensuring clarity and understanding. The theory also highlighted that temporality is important when providing opportunity for reflection on training and on the strategies themselves. This will offer teachers an opportunity to see the improvement emerge. It will also support teachers in understanding and learning from the change, to inform future school improvement strategies.

The final tension is a Complexity characteristic. Teachers describe striving for equilibrium. Complexity describes how equilibrium cannot be maintained as all systems need to change and emerge. This would determine that this tension needs careful management, as while teachers (and schools) continue to strive for something that is unattainable, there is the potential for teachers to feel stress and powerlessness in their roles. This could be a destructive force in schools and for

individuals. However, Complexity has also exposed schools to be resilient to change, ensuring that when an unexpected event occurs, schools can self-organise and make themselves stronger.

10.4 Potential implications for policy and practise.

The research has identified tensions in school improvement that teachers both perceive as having a both a positive and negative impact on school improvement and in their role in the development of the school. I would suggest that an awareness and recognition of these tensions would be beneficial when considering the implementation of any new school improvement strategy at each stage of the hierarchy (from government policy makers, through to multi-academy trusts, headteachers and subject leaders).

A prominent finding that teachers referred to and had a shared perception about, was the credibility of experts commissioned in schools to support school improvement. Where experts were perceived to be credible, they were perceived to impact positively on teachers and on school improvement. While it is possible that the messages the teachers were receiving from the experts may not have been welcomed and therefore the teachers perceived the expert as not credible, it is also important to consider the opportunities available for teachers to become more aware of the credibility of the experts they are expected to work with. An understanding of the expertise of commissioned support and an awareness of the focus of their activity, I would argue, may support teachers in being more open to change and improvement opportunities. It is also possible, that if the teachers perceive the experts correctly, (that they understand the context of the school, or the practical boundaries teachers are working within) there are greater opportunities for school improvement. Time to build this understanding and trust is important.

Teachers recognise how external identification of deficits in a school may often supersede the opinion of the teachers and their response to challenges a school is facing. An implication of this is to acknowledge why we value the views of those working outside of the school more than we value the expertise of the teachers who work in the schools. If this is not the case, and the value of their opinions are equitable, then should we consider why it is that we offer more resources to respond

to the views of external identification methods? Are we therefore measuring what we value or valuing what we measure?

Funding that is ring-fenced was also a tension that offered a good solution to school improvement (by ensuring that budgets are focused on the greatest need) but were also seen as hindering the opportunities for improvement in other areas. One teacher referred to the new practise of directing the pupil premium spend to all pupils, reminding us that there was a time when leaders were requested to identify how they had spent the fund on individuals. This resulted in leaders spending money on unnecessary interventions to ensure each pupil premium child had an equitable amount spent on them. This was unrealistic and unnecessary. As a result, the parameters of how this fund could be spent was changed, with a recognition that pupil premium could be spent more flexibly and may also impact positively on those pupils not in receipt of the premium. Is there a place for this approach with other ring-fenced spending? For example, if a school feels that they have spent the primary sports grant on everything they need to promote physical education, but they need more books to support their lower ability readers, could this money be evidenced as being spent in a more usefully directed way, without implications for school leaders? This would require there to be trust between those financing schools and headteachers, a value that the teachers identified as important in the school improvement journey.

Workloads continue to be a challenge for teachers, and the new Ofsted framework (2019) identifies how school leaders should be considering the workload of staff and reducing it where unnecessary tasks have been implemented. I would propose that teacher workloads are not something that only school leaders should be considering. While external inspections continue to expect all primary teachers to know their subjects (and the related subject disciplines and conceptual understanding) to the same extent as their secondary colleagues, this will remain a challenge. In small schools, some teachers may be responsible for three or more subjects, they will also have a full-time class responsibility. The tension between them wanting to fulfil their role as leaders of subjects and retain their class responsibility, should not be underestimated. Teachers recognise that there is a considerable workload related to being a primary school teacher and this is accepted, however, if this tension is not

balanced carefully with time and understanding from external inspectors, then the education sector may not retain the good teachers we have in our schools.

Retention of staff is also a consideration when discussing the finding 'striving for equilibrium'. This was discussed in a largely positive way by teachers. They wanted to improve and to ensure their schools were the best they could be. However, the impact on schools could be vast, with only those that can manage continual change able to sustain working in such an environment. An awareness that teachers perceive the need to strive for equilibrium despite understanding that it can never be reached, is important to consider when making changes to school policy, procedure, and expectations.

Workload is also impacted on by formal paperwork. Again, teachers accept that there are positives to this paperwork completion and understand the purpose, however, they discuss a tension between this and the practical solutions that need to be found. I would argue that this gap could be bridged. Are there ways that formal paperwork could work alongside the need that teachers have to find practical solutions? Could school development plans, for example, be written in a way that offers practical solutions in challenging circumstances? I would suggest that writing these with teachers might be a way of ensuring that this focus is prevalent in the final, formal documentation.

The last implication for stakeholders who develop policy and procedures for school to consider, is the impact of leadership on teachers' relationships with their colleagues. Leadership requires individuals to have challenging conversations, something that someone on the leadership scale (a teacher in England whose pay scale is unrelated to the time they have taught but based on the level of leadership responsibility they have in the school) would be expecting. However, teachers are being required to carry out more of these leadership responsibilities, monitoring their colleagues and offering feedback. This is perceived by teachers as a necessary part of the role (and is a criterion within the teacher standards, a list of standards teachers are contractually obliged to fulfil) however, is not without tension. It can be a positive tension, where strong professional relationships are supportive and bring about rapid change, but that is also challenging. I advocate that while it is important that teachers lead subjects and take ownership over whole school directives, it is

important to consider the impact this has on them and the impact it may have on their professional relationships and on school improvement objectives.

10.5 Professional impact

As a school leader myself, how teachers perceive school improvement is important in ensuring the best outcomes for teachers, the school and most importantly, the pupils.

As suggested in the implications for policy and practise section (10.4) the clarity with which I introduce school improvement strategies and personnel will now be at the forefront of my professional practise. Taking the time to explain the decisions but also offering teachers the time to contribute to these decisions will be important. This would also be a response to the hierarchy perceived by teachers to influence school improvement decisions. As a school leader I would have considered that headteachers offer a leadership model that is more distributed than the model teachers in my study describe. Therefore, responding to teachers in a more inclusive way will be a consideration. I would recommend that there are opportunities for leaders to give teachers the opportunity to answer big questions and expect difficult answers. Offering teachers, the opportunity to consider what the school does well but also what the school needs to improve on, could be a way of getting staff motivated about any future improvement. It will be important to ensure that staff are aware of the starting points of any improvement measures.

The greatest concern about the findings, to me as a school leader, is the lack of clarity about outcomes and starting points of school improvement in the teachers explanations. Often teachers were unclear about the starting points (although most could explain the bifurcation point) but more often, teachers were unclear about the outcomes or expectations of whether strategies were to continue. This was not always the case. Opportunity to reflect on outcomes is vital. Teachers could not discuss with any clarity the outcome of their school improvement endeavours. I would argue that these outcomes have been recorded by schools, but they have not been shared or discussed with the teachers. Missed opportunities to reflect might suggest missed opportunity for learning.

Trust is built over time and ensuring that teachers have that opportunity to build relationships with teams that they trust, is vital to any school improvement success. As a leader of a school, it is important not to underestimate the power of these trusting relationships in the school improvement journey. This is also important when considering the informal relationships that teachers have with each other, as teachers perceive these to be more powerful in school improvement than the more formal relationships. It will be important to not underestimate this perception and make the most use of this when introducing new strategies. This will also be the case when considering the use of an external expert (often at a financial expense to the school). I will need to consider the impact of experts on teachers and how their impact can be received and responded to in a way that is conducive to the findings of this study.

Many of the changes I will need to implement because of this study, require time. Time for leadership and time to reflect and build relationships and as Harris and Muijs (2005) recommend, time to build teacher networks. Workloads remain an important consideration for all school leaders. As time cannot be created, and budgets will not be increasing, it is challenging to find a solution to giving teachers more time to lead the school forward in its improvement. However, giving teachers time to implement training and reflect on the training (Harris and Muijs, 2005) and the successes (or lack of success) is important. I would propose that the way to create more time is, that we should attempt to do less, but to do it better. This is challenging when the expectation for rapid improvement is often so prevalent in our schools.

The tensions were often described as having a positive impact on school improvement. They encouraged change where it was needed, directed funding and support in the right places, and commissioned experts to develop staff expertise. It will be important to remember these positive tensions in the system and exploit them where possible. This will also support what Harris and Muijs (2005) consider to be a key challenge for school improvement, the 'ability to manage change and development' (Harris and Muijs, 2005, p. 37).

I conclude that using Complexity Theory in my study as a way of describing and considering the emergence of school improvement has been successful. However,

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Allen, Evans and White (2021) also warn that Complexity can offer a distraction. It will therefore be important to not become too distracted by the Complexity of the system and the complex nature of the school improvement challenges when making decisions and beginning new strategies. There will be a temptation to delay starting anything new while contemplating the tensions and characteristics that Complexity has revealed. This will need to be balanced with ensuring any new learning from this study is acted upon.

10.6 Implications for future research

One of the tensions in school improvement was time, so it would seem worthwhile to consider researching the time in schools that is protected for school improvement. This would be challenging from a definition's perspective, defining what is or what isn't a school improvement activity. It would also require individuals to record their own time spent and record the activities they participated in. If these challenges could be overcome, it would also be worthwhile to compare the results in different size schools and schools at different stages in the Ofsted inspection timescales. A school that has recently been inspected might be likely, for example, to participate in more improvement activities than a school that has just been inspected and graded by Ofsted as 'good' or better. Reflection on the success of these strategies related to the time spent on them, would be an important aspect of this research. This could be presented in a similar way to the Education Endowment Foundation research into Feedback (2021), as activities that have high impact versus low cost.

I have suggested the potential impact of the tensions on teacher retention and on the performance of schools. Research that considers why teachers who leave the profession, with reference to the tensions offered, might be of interest. Additionally, determining whether there is a differential between how the tensions are perceived in schools that are high performing compared with lower performing schools, might offer insight into how the tensions can be balanced to offer optimal output in school improvement. The challenge of how to determine a school's performance would be vital in contextual understanding of these schools.

A limitation of my study was in the opportunity to offer practical solutions to the challenges the teachers describe. Further research into practical solutions to these

challenges would be of benefit to the teachers I spoke to. The opportunity to work with teachers on a school development plan that considered the practical solutions and tensions identified in this study, might also be of interest.

This study only considered the perceptions of teachers, however there are a wide variety of stakeholders involved in the school improvement process. Considering how school leaders, governors and pupils perceive school improvement, may offer some insight into the five tensions and might offer ways to make the school improvement process more efficient and productive.

Finally, Complexity Theory was suggested in my study as a helpful way to describe and research school improvement. Further research, that clarifies its intention to use Complexity in the research design, might be of interest in other areas of the school system. It might also be useful to consider how this approach could be used in other fields of study and whether the definition that I offered in this study remains a suitable way of defining Complexity in other disciplines.

10.7 Concluding thoughts

The school improvement literature considers how school improvement can be defined and measured. The current literature determines ways in which schools can approach change for improvement and how documentation such as school development plans can be designed to have the greatest impact. The relationship between leadership approaches and quantifiable outcomes of pupils has also been explored, as have the warnings from some educationalists about the problems associated with accepting, as the title of Allen *et al.* (2021) book indicates, 'the next big thing in school improvement', without contextual understanding. However, the teachers remain at the forefront of school improvement and yet their perception and relationship with school improvement has been researched to a lesser extent. This study has explored teacher perception of school improvement and has given insight into how teachers identify tensions within the process. Exploring the teachers' perceptions of school improvement has therefore added to the existing knowledge.

School improvement literature has documented how strategies, such as, principal leadership styles or school improvement partners, have impacted on quantitative outcomes for pupils. My study has not attempted to, or found, a correlation between

the perceived school improvement tensions and quantifiable pupil outcomes. Instead, the data analysis identified the tensions based on the impact teachers perceived them to have on pupils (in both a quantifiable and qualitative way). Teachers discussed data outcomes (how children attained at the end of the year and key stages) but also perceived other outcomes as important, such as improvements in pupils' social and emotional wellbeing. In this way, my study has taken a different approach and added to the literature on school improvement.

Prior to beginning my research, Complexity Theory was identified as a lens through which the methodological approach would be intentionally structured. The intention was also to use Complexity to describe the findings and emerging theory. Therefore, the description of school improvement, research methods, instrument design, analysis (including coding) and results, were planned and structured using Complexity Theory prior to the data collection. Although Complexity has been used to describe school systems in educational research and, in a few cases, has been highlighted for methodological use in the health research sector, my study has offered a new lens through which to study school improvement. My study has therefore offered a new approach to studying school improvement.

My study took an iterative approach that aligned itself with Grounded Theory. However, significant differences in comparison to Grounded Theory are evident in my study. My research, as previously discussed, used a predetermined set of characteristics in the research instrument design and data collection. It also used these predetermined characteristics in the initial coding. The study therefore offered a new approach by bridging the gap between the thematic response of Grounded Theory and responding with a predetermined theoretical structure.

Using a lens of Complexity enabled the theory to emerge. This theory identified five tensions, perceived by teachers, to impact on school improvement. It could be suggested that how we approach school improvement in the future could be linked with a response to the five tensions. The tensions appear to balance, much like the equilibrium described by Complexity Theory. They describe ways in which they can both benefit and hinder school improvement. However, improvement is further hindered when this balance is not maintained. Leaders and policy makers might consider reflecting on these barriers to improvement prior to planning or

implementing a new improvement strategy. In contrast, teachers also perceive some tensions as being necessary and impacting on school direction in a positive way. School leaders could therefore consider how these tensions could be exploited to best utilise them in any school improvement strategy.

Better utilisation and management of the tensions might also support the current efforts to manage teacher workload. With the current challenges associated with teacher retention and recruitment, improving teacher workload might be a way of tackling this difficulty that schools face. To ensure schools remain as systems that change for the better, constantly improving and developing practise for the good of their pupils, managing these tensions is vital in ensuring schools positively impact on the changing needs and the life chances of the pupils and communities that they serve.

Reference List

Alhadeff-Jones, M. (2008) 'Three generations of Complexity theories: nuances and ambiguities', *Educational Philosophy and Theory,* 40 (1), pp. 66 – 82.

Allen, D. (2016) 'The resourceful facilitator: teacher leaders constructing identities as facilitators of teacher peer groups', *Teachers & Teaching*, 22 (1), pp. 70-83.

Arrowsmith, T. (2007) 'Distributed leadership in secondary schools in England: the impact on the role of the headteacher and other issues', *British Educational leadership, Administration and Leadership,* 21 (2), pp. 21- 27.

Ainscow, M. and Southworth, G (1996) 'School improvement: A study of the roles of leaders and external consultants', *School effectiveness and school improvement,* 7 (3), pp. 229 – 251.

Ainscow, M., Muijs, D. and West, M. (2006) 'Collaboration as a strategy for improving schools in challenging circumstances', *Improving schools,* 9 (3), pp. 187 – 304.

Allen, R., Evans, M. and White, B. (2021) *The next big thing in school improvement*, Woodbridge: John Catt.

Andrews, R. (2003) *Research Questions.* London: Continuum.

Atkinson, W. (2000) 'School improvement', *Royal Society of Arts Journal,* 148 (5494), pp. 53 – 59.

Auerbach, C. F. and Silverstein, L. B. (2003) *Qualitative data: An introduction to coding and analysis.* New York: New York university Press.

Backman, Y., Alerby, E., Bergmark, U., Gardelli, A., Hertting, K., Kostenius, C. and Öhrling, K. (2018) 'Improving the School Environment from a Student Perspective: Tensions and opportunities', *Education enquiry,* 3 (1), pp. 19 -35.

Baecher, L. (2012), 'Pathways to teacher leadership among English-as-a-second-language teachers: professional development by and for emerging teacher leaders', *Professional Development in Education*, 38 (2), pp. 317-330.

Ball, S. J. (2009) 'Privatising education, privatising education policy, privatizing educational research: Network Governance and the 'competition state'', *Journal of Education Policy,* 24 (1), pp. 83 – 99.

Barth, R. S. (1990) 'Improving schools from within', *Bulletin of Science, Technology and Society,* 12 (2), pp. 108 – 108.

Barth, P., Haycock, K., Jackson, H., Mora, K., Ruiz, P., Robinson, S. and Wilkins, A. (1999) *Dispelling the myth. High poverty schools exceeding expectations.* Washington, DC: The Education Trust.

Beddoes, Z. E., Prusak, K. A. and Barney, D. (2019) 'Taking the Helm: Physical Educators Managing Change through Professional Learning Communities', *National Association for Kinesiology in Higher Education (NAKHE),* 71 (4), pp. 479 – 496.

Beekun, R. I. and Glick, W. H. (2001) 'Organisation Structure from a loose coupling perspective: A multidimensional approach'. *Decision Sciences.* 32 (2), pp. 227 – 250.

Benoliel, P. and Berkovich, I. (2017) 'There is no 'T' in school improvement: the missing team perspective', *International Journal of Educational Management, 31 (7),* pp. 922 – 929.

Bickmore, D. L., Gonzales, M. M. and Roberts, M. B. (2021) 'Exploring School Leaders Communities of Practice and School Improvement', *NASSP Bulletin,* 105 (3), pp. 173 – 191.

Biesta, G. (2010) 'Five theses on complexity reduction and its politics', *Complexity theory and the politics of Education*, in D. Osberg, and G. Biesta, G. (eds) Rotterdam: Sense, pp. 5 -13.

Boothroyd, C., Fitz-Gibbon, C., McNicholas, J., Thompson, M., Stern, E. and Wragg, T. (1997) *A better system of inspection?* Hexham: Ofstin.

Borman, G. D., Rachuba, L., Datnow, A., Ahlberg, M., Maciver, M. and Stringfield, S. (2000) *Four models of school improvement. Successes and challenges in reforming low-performing, high poverty schools.* Baltimore: John Hopkins University, Center for research into the education of students placed at risk.

Botello, M. and Glasman, S. (1999) Dimensions of teacher in-service training for school improvement, *The International Journal of Educational Management*, 13, (1), pp. 14-24.

Bottery, M. *Educational Leadership for a more sustainable world.* London: Bloomsbury Publishing Ltd.

Brainard, J. and Hunter, P. R. (2016) 'Do complexity-informed health interventions work? A scoping review', *Implementation Science, 11 (127),* pp. 1 – 11.

Braithwaite, J., Churruca, K., Ellis, LA., Long, J., Clay-Williams, R, Damen, N., Herkes, J., Pomare, C., and Ludlow, K. (2017) Complexity Science in Healthcare – Aspirations, Approaches, Application and Accomplishments: A White Paper', *Australian Institute of Health Innovation,* Sidney, Australia: Macquarie University.

Braukmann, S. and Pastiardis, P. (2010) 'The clash of evaluations: In search of the missing link between school accountability and school improvement – experiences from Cyprus', 24 (4), pp. 330 – 350.

Briggs, A. R. J., Coleman, M. and Morrison, M. (2014) *Research Methods in Leadership and Management.* London: Sage.

Brinkmann, S. and Kvale, S. (2015) *Interviews: Learning the craft of qualitative research interviewing.* Los Angeles: Sage.

Brinkmann, S. (2014) 'Unstructured and Semi-Structured Interviewing', in Leavy, P. (ed) *The Oxford Handbook of Qualitative Research.* Oxford: Oxford University Press. pp. 277 -299.

Bush, T. (2011) *Theories of Educational Leadership and Management.* London: Sage.

Byrne, D. (2005) *Social exclusion.* New York: Open University Press.

Byrne, D. (2002) *Complexity Theory and the Social Sciences: An Introduction.* London: Routledge.

Byrne, D. (1997) 'Complexity Theory and Social Research', *Social Research Update,* 18, pp. 1 – 6.

Cameron, D. H. (2010) 'Working with secondary school leadership in a large-scale reform in Lindon, UK: Consultants' perspectives of their role as agents of school change and improvement', *Educational management administration and leadership,* 38 (3), pp. 341 – 359.

Chandler, J., Rycroft-Malone, J., Hawkes, C., and Noyes, J. (2015) 'Application of simplified Complexity Theory concepts for healthcare social systems to explain the implementation of evidence into practice'*, Journal of Advanced Nursing,* 72 (2), pp. 461–480.

Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis.* London: Sage Publications.

Charmaz, K. (1994). 'Discovering chronic illness: Using grounded theory', in B. Glaser (ed.) *More grounded theory methodology: A reader.* Mill Valley, CA: Sociology Press. pp. 65-93.

Chun-Tie, Y., Birks, M. and Francis, K. (2019) 'Grounded Theory Research: a design framework for novice researchers', *Sage open medicine.* 7, pp. 1 – 8.

Cicourel, A.V. (1964) *Method and Measurement in Sociology.* New York: The Free Press.

Cilliers, P. (2005) 'Complexity, Deconstruction and Relativism', *Theory, culture, and society,* 22 (5), pp. 255–267.

Cilliers, P. (2000) 'What can we learn from a Theory of Complexity?' *Emergence,* 2 (1), pp. 23 – 33.

Cilliers, P. (1998*) Complexity and postmodernism: Understanding complex systems.* New York: Routledge.

Cochran-Smith, M., Ell, F., Ludlow, L., Grundoff, L. and Aitken, G. (2014) 'The Challenge and Promise of Complexity Theory for Teacher Education Research', *Teachers College Record,* 116, pp. 1 – 38.

Coburn, C. E., Russell, J. L., Heath Kaufman, J. Stein, M. K. (2012) Supporting Sustainability: Teaches' advice networks and ambitious instructional reform, *American Journal of Education,* 119 (1), pp. 137 – 182.

Cohn, L., Manion, L., Morrison, K. (2018) *Research Methods in Education,* Routledge: London.

Cohen, L., Marion, L. and Morrison, K. (2007*) Research Methods in Education*. London: Routledge.

Collinson, V. and Cook, T.F. (2007) *Organisational Learning: Improving learning, teaching, and leading in schools systems*, Michigan: Sage publications.

Corcoran, R. (2017) 'Preparing Principals to Improve Student Achievement', *Child Youth Care Forum*, 46, pp. 769–781.

Creswell, J. (2007) *Qualitative inquiry and research design: choosing among five traditions.* London: SAGE Publications Ltd.

Dag, S., and Gumuseli, A. I. (2011) 'School improvement needs analysis of the public primary schools in Istanbul', *Procedia - Social and Behavioural Sciences,* 15, pp. 2716-2721.

Datnow, A. M. (2022) 'Power and Politics in the adoption of school reform models', *American Educational research association,* 22 (4), pp. 357 – 374.

Davis, B., Phelps, R., and K. Wells, (2004) 'Complicity: An introduction and a welcome', *An international journal of Complexity and education, 1 (1), pp. 1 – 3.*

Day, C., and Leith*, R. (*2007). 'The continuing professional development of teachers: Issues of coherence, cohesion, and effectiveness', in Townsend, T. (2007) The International Handbook of school effectiveness and improvement. The Netherlands: Springer, pp. 707 – 726.

Davies, M. (2007) *Doing a Successful Research project: using qualitative or quantitative Methods.* Basingstoke: Palgrave Macmillan.

Davies, B., and Ellison, L. (2003) *The new strategic direction and development of the school: key frameworks for school improvement planning,* Routledge Falmer: London and New York.

Davis, B. (2015) *'Making reforms happen*, *Education Policy Outlook 2015'*, Available at: https://doi.org/10.1787/4cf5b585-en, (Accessed: 22nd October 2022).

Davis, B., and Samara, D.J. (1997) 'Cognition, Complexity, and Teacher Education', *Harvard Educational Review,* 67 (1), pp. 105 – 125.

Davis, B., Sumara, D. and Luce-Kapler, R. (2007) *Engaging Minds: Changing teaching in complex times.* New York: Routledge.

Dedering, K. Goecke, M. and Rauh, M. (2015) 'Professional background and working practices of consultants in school development: Initial empirical findings from Germany', *Journal of Educational change,* 16, pp.27 – 52.

Demerath, P. (2018) 'The emotional ecology of school improvement culture. Charged meanings and common moral purpose'. *Journal of Educational Administration. 56 (5), pp. 488 – 503.*

Department for education and skills, (2006), *'Departmental Report 2006'*, Available at: https://assets.publishing.service.gov.uk/ (Accessed: 29th July 2022).

Department for Education and Skills (2011) 'Review of the National Curriculum in England Summary report of the call for evidence 2011', Available at: https://www.gov.uk/government/publications/teachers-pension-scheme (Accessed: 12th October 2022)

Department of Education legislation (2010) 'Academies Act 2010', Available at: www.legislation.gov.uk (Accessed on: 12th October 2022).

Department for Education (2001) *Special Educational Needs Code of Practice.* Available at: https://www.gov.uk/government/publications/special-educational-needs-sen-code-of-practice

(Accessed: 4th December 2017).

Department for Education (2019) *Pupil premium.* Available at: Pupil premium - GOV.UK (www.gov.uk) (Accessed: 27th October 2022).

Department of Education legislation (2002) *'Education Act'*, Available at: Education Act 2002 (legislation.gov.uk) (Accessed on 12th October 2022).

Devos, G., Tuytens, M. and Hulpia, H. (2014) 'Teachers' Organizational Commitment: Examining the Mediating Effects of Distributed Leadership', *American Journal of Education,* 120 (2), pp. 205-231.

Dong, N., Harris, A. and Ng, D. (2019) 'A review of the empirical research on teacher leadership (2003–2017): Evidence, patterns and implications', *Journal of Educational Administration,* 58 (1), pp. 60 -80.

Dreher, M. and Dreher, E. (1991) Gruppendiscussionverfahren', in U. Flick, U. Handbuch (ed.) *Qualitative sozialforschung*. Munich: Psychologie Verlags Union. pp 186 – 188.

Eidelson. R. (1997) 'Complex adaptive systems in the behavioural and social sciences', *Review of General Psychology,* 1 (1), pp. 42 – 71.

Education Endowment Foundation (2021) *'Feedback'*, Available at: Feedback | EEF (educationendowmentfoundation.org.uk) (Accessed: 26th October 2022).

Elliott, A. (2012) 'Twenty years inspecting English schools – Ofsted 1992-2012', *Research and Information on State education,* Available at: https://dera.ioe.ac.uk/38905, (Accessed 29th December 2021).

Evans, L. (1998) *Teachers' motivation,* London: Continuum Press.

Feldhoff, T., Radisch, F. and Bischof, L. M. (2015) 'Designs and Methods in school improvement research: a systematic review', *Journal of Educational Administration,* 54 (2), pp. 209 – 240.

Fenwick, T. (2010) 'Normalising Standards in educational complexity: A network analysis', in Osberg, D. and Biesta, G. (eds) *Complexity theory and the politics of Education.* Rotterdam: Sense, pp. 57 - 68.

Fullan, M. (2011) *Motion leadership,* Corwin, California: Thousand Oaks.

Fullan, M. J. (1992) *Successful school improvement,* Buckingham: Open University Press.

Fullan, M. G. (1992) *The new meaning of change,* London: Cassell.

Garcia Torres, D. (2018) 'Distributed leadership and teacher job satisfaction in Singapore', *Journal of Educational Administration,* 56 (1), pp. 127 – 142.

Garrison Wilhelom, A., I – Chien, C., Smith, T. M., and Frank, K. A. (2016) 'Selecting expertise in context: middle school mathematics teachers' selection of new sources

of instructional advice', *American Educational Research Association,* 52 (3), pp. 456 – 4911.

Gear, C., Eppel, E. and Koziol – McLain, J. (2022) 'If we can imagine it, we can build it: Developing Complexity Theory-Informed Methodologies'*, International Journal of Qualitative Methods,* 21, pp. 1 -11.

Gear, C., Eppel, E. and Koziol-Mclain, J. (2018) 'Advancing Complexity Theory as a Qualitative Research Methodology', *International Journal of Qualitative Methods',* 17, pp. 1 – 10.

Geer-Frazier, B. (2014) 'Complexity Leadership generates innovation, learning and adaptation of the organisation', *Emergence: Complexity and Organisation',* 16 (3), pp. 105 – 116.

Gelsthorpe, T., and West-Burnham, J. Eds. (2003) *Educational Leadership and the community: strategies for school improvement through community engagement',* London: Pearson Education.

Gilham, B. (2005) *Research Interviewing: The range of techniques.* Maidenhead: Open University Press.

Glaser, B. G. and Strauss, A. (1965) *Awareness of Dying.* Chicago: Aldine.

Glaser, B. G. and Strauss, A. (1967) *The Discovery of Grounded Theory.* Chicago: Aldine.

Goldenberg, C. (2003) 'Settings for School Improvement'. *International Journal of disability, development, and education,* 50 (1), pp. 7 – 16.

Gorard, S. (2008) 'The value-added of primary schools: What is it really measuring?' *Educational Review,* 60 (2), pp. 179 – 185.

Gray, J., Goldstein, H. and Thomas, S. (2003) 'Of trends and trajectories: searching for patterns in school improvement', *British, Educational Journal,* 29 (1), pp. 83 – 88.

Gray, J., Hopkins, D., Reynolds, D., Wilcox, B., Farrell, S., and Jesson, D. (1999) *Improving schools: performance and potential*, Buckingham: Open University Press.

Greany, T. (2015) 'More fragmented, and yet more networked: Analysing the responses of two Local Authorities in England to the Coalition's 'self-improving school-led system' reforms', *London Review of Education*, 13 (2), pp.125 – 143.

Gronn, P. (2000) 'Distributed properties: a new architecture for leadership, *Educational management and administration,* 28 (3), pp. 317 – 383.

Guskey, T. R. (1995). Professional development in education: in search of the optimal mix, in Guskey, T. R. and Huberman, M (eds) *Professional development in education: new paradigms and practices.* New York, Teachers College Press.

Guzman-Valenzuela, C. (2016) 'Connecting Theory and Practice in Qualitative Research', in Huismann, J. and Tight, M. (eds.) *Theory and Methods in Higher Education.* Volume 2. United Kingdom: Emerald. pp. 92 – 105.

Hallinger, P. and Heck, R. H. (2010) 'Leadership for Learning: Does collaborative leadership make a difference in school improvement?' *Educational Management Administration and Leadership,* 38 (6), pp. 654 – 678.

Hargreaves, A. (1999) *Creative professionalism: the role of teachers in the knowledge society,* DEMOS: London.

Hargreaves, A. (2002) Professional learning communities and performance training cults: the emerging apartheid of school improvement, in A. Harris, D. Hopkins, A. Hargreaves, *Effective leadership for school improvement.* London: Routledge.

Hargreaves, A. and Goodson, I. (2006) 'Educational Change over time? The sustainability and non-sustainability of three decades of secondary school change and continuity', *Educational Administration Quarterly,* 42 (1), pp. 3 – 41.

Hargreaves, A., Harris, A., Boyle, A., Ghent, K., and Goodhall, J. (2010) *Performance beyond expectations,* National College for school Leadership.

Harris, A (2001) 'Department improvement and school improvement: a missing link', *British Educational Research Journal,* 27 (4), pp. 477 – 485.

Harris, A. (2004) 'Distributed leadership and school improvement. Leading or misleading?', *Educational management administration and leadership,* 32 (1), pp. 11 – 24.

Harris, A. (2013) 'Distributed leadership. Friend of foe?', *Educational management administration and leadership,* 41 (5), pp. 53 – 693.

Harris, A. (2014) *Distributed Leadership Matters – Perspectives, Practicalities and Potential,* Corwin: Sage.

Harris, A. and Lambert, L. (2003) *'Building leadership capacity for school improvement',* Buckingham: Open University Press.

Harris, A., and Muijs, D. (2005) *Improving Schools Through Teacher leadership,* Maidenhead: Open University Press.

Hart, A. (1994) 'Work Feature Values of Today's and Tomorrow's Teachers: Work Redesign as an Incentive and School Improvement Policy', *Educational Evaluation and Policy Analysis,* 16 (4), pp. 458-473.

Heck, R. and Hallinger, P. (2010) 'Testing a longitudinal model of distributed leadership effects on school improvement', *The Leadership Quarterly,* 21 (5), pp.867 – 885.

Henderson, E. S. (1978). *The evaluation of in-Service teacher training*, London: Croom Helm.

Her Majesty's stationery office (1997) *White paper: Excellence in schools (*Cm 3861) (London) Accessed at: http://www.educationengland.org.uk/documents (Accessed on: 12th October 2022).

Hetherington, L. (2013) 'Complexity Thinking and Methodology: The Potential of Complex Case Study for Educational Research'. *Complicity: An International Journal of Complexity and Education.*   10 (1/2), pp. 71 – 85.

Holden, G. (2002) *'Towards a learning community: the role of teacher-led development in school improvement.* Paper presented at the CELSI British Council Leadership in Learning conference, London. Doi: 10.1080/13674580200200168 (Accessed on: 6th January 2022).

Hollingworth, L., Olsen, D., Asiken-Garmager, A. and Winn, K. W. (2017) 'Initiating conversations and opening doors: How principals establish a positive building culture to sustain school improvement efforts', *Educational Management Administration and Leadership,* 46 (6), pp. 1014 – 1034.

Homan, R. (2002) 'The Principle of Assumed Consent: the ethics of Gatekeeping', in McNamee, M. and Bridges, D. (eds) *The ethics of educational research.* Oxford: Blackwell Publishers Ltd. pp. 23 – 39.

Homan, R. (1991*) The ethics of social research.* London: Longman.

Hopkins, D. (2001) *School improvement for real,* London and New York: Routledge and Falmer.

Hopkins, D., Ainscow, M. and West, M. (1994) *School Improvement in an era of change,* London: Continuum International Publishing Group.

Hopkins, D. and Harris, A (1999) 'Teaching and Learning and the challenge of educational reform', *School Effectiveness and School Improvement,* 10, pp. 257 – 267.

Hunzicker, J. (2012) 'Professional development and job-embedded collaboration: how teachers learn to exercise leadership', *Professional Development in Education*, 38 (2), pp. 267-289.

Johnson, S. (2010) *Where good ideas come from,* London: Penguin

Johnson, W. (2012) 'Never underestimate the value of connections: social capital's strength lies in expertise, reciprocity, and relevance', *Journal of staff development, 33 (1), pp. 38 – 41.*

Joullie, JE. (2016) 'The Philosophical Foundations of Management Thought', *Academy of Management Learning and Education,* 15 (1), pp. 157 – 179.

Jordan, M., Lanham, H. J., Anderson, R. A. and McDaniel, R. R. Jr. (2010) 'Implications of complex adaptive systems theory for interpreting research about health care organisations'. *Journal of Evaluation in Clinical Practice.* 16, pp. 228 – 231.

Josic, S., Dzinovic, V., and Cirovic, I. (2014) 'Teachers' perceptions of factors impeding school improvement in Serbia', Serbian Psychological Association, 47(2), pp. 231–247.

Joyce, B., Calhoun, E. and Hopkins, D. (1999) *The structure of school improvement.* Buckingham, UK: Open University press.

Kamberelis, G. and Demitriadis, G. (2014) 'Focus Group Research**:** Retrospect and Prospect', in Leavy, P. (ed) *The Oxford Handbook of Qualitative research.* Oxford: Oxford University press.

Karagiorgi, Y. and Charalambous, K. (2006) 'ICT in-service training and school practices: in search for the impact', *Journal of Education for teaching,* 32 (4), pp. 395 – 411.

Karami-Akkary, R, Mahfouz, J. and Mansour, S. (2018) 'Sustaining school-based improvement: considering emotional responses to change'. *Journal of Educational Administration.* 57 (1), pp 50 – 67.

Katzenmeyer, M. and Moller, G. (2001) *Awakening the sleeping giant: helping teachers develop as leaders,* Thousand Oaks, CA: Corwin Press.

Kelly, A. (2001) *Benchmarking for school improvement: A practical guide for comparing and improving effectiveness',* London and New York: Routledge Falmer.

Kelly, A., and Downey, C., (2011) *Using effectiveness data for school improvement: developing and utilizing metrics',* London: Routledge.

Kershner, B. and McQuillan, P. (2016) 'Complex Adaptive Schools: Educational Leadership and School Change', *Complicity: An International Journal of Complexity and Education,* 13 (1), pp. 4 – 29.

Kincheloe, J. (2007) 'Describing the Bricolage: Conceptualising a new rigor in Qualitative Research'. *Qualitative Inquiry,* 7 (6), pp. 679 – 692.

Kvale, S. (1996) *Interviews: an introduction to qualitative research interviewing.* London: Sage.

Kvale, S. (2007) *Doing Interviews.* London: Sage.

Kvale, S. and Brinkmann, S. (2009) *Interviews: Learning the Craft of Qualitative Research Interviewing.* London: Sage.

Lai, E. and Cheung, D. (2015) 'Enacting teacher leadership: the role of teachers in bringing about change', *Educational Management Administration & Leadership*, 43 (5), pp. 673-692.

Layder, D. (2005) *Sociological practice: Linking theory and social research.* London: Sage.

Lee, M. and Seashore Louis, K. (2019) 'Mapping out a strong school culture and linking it to sustainable school improvement'. *Teaching and Teacher Education,* 81, pp. 84 – 96.

Leithwood, K. (2016) 'Department-Head leadership for School Improvement'. *Leadership and Policy in Schools.* 15 (2), pp 117 – 140.

Leithwood, K., Jantzi, D., and Steinbach, R. (1999) *Changing relationship for changing times',* Buckingham, Philadelphia: Open University Press.

Levacic, R. (1995) *Local Management of Schools: Analysis and Practice.* Buckingham: Open University Press.

Leviac, R., Glover, D., Bennett, N. and Crawford, M. 'Modern Headship for the Rationally Managed School: Combining Cerebral and Insightful Approaches' in Bush, T., Bell, L., Bolam, R., Glatter, R. and Ribbons, P. (1999) *Educational Management redefining theory, policy, and practice.* London: Paul Chapman Publishing. pp. 15 – 21.

Liebermann, A., Saxl, E. R., and Miles, M. B. (2000) 'Teacher Leadership: ideology and practice', *The Jossey-Bass Reader in Educational leadership,* San Francisco, CA: Jossey-Bass.

Lincoln, Y. S. and Guba, E. (1985) *Naturalistic Enquiry.* CA: Sage.

Little, J. W. (1990) The persistence of privacy: autonomy and initiative in teachers' professional relations, *Teacher College record,* 91, pp. 55 – 56.

Liu, J. (2021) 'Building education groups as school collaboration for education improvement: a case study of stakeholder interactions in District A of Chengdu', *Asia Pacific Education Review,* 22, pp. 427 – 439.

Lorion, R. P. (2010) 'Understanding Sarason's concepts of a school cultures and change: joining a community in school improvement efforts', *American Journal of Community Psychology,* 48, pp. 147 – 156.

Louis, K. S. and Miles, M. B. (1990) *Improving the urban high school: what works and why',* New York: Teachers College Press.

Loxley, A., Johnston, K., Murchan, D., Fitzgeralg, H., and Quinn, M. (2007) The role of whole-school contexts in shaping the experiences and outcomes associated with professional development', *Journal for in-service training,* 33 (3), pp. 265 – 285.

Lumby, J. (2013) 'Distributed Leadership: The Uses and Abuses of Power', *Educational Management Administration & Leadership,* 41 (5), pp. 581-597.

Lundberg, C.C (1997) 'Towards a general model of consultancy', *Journal of organisational change management,* 10 (3), pp. 193 – 201.

Macbeath, J. (1998) *Effective school leadership: responding to change,* London: Paul Chapman.

Macnaghten, E., & Myers, G. (2004). *'Focus groups: The moderator's view and the analyst's view',* Gobo, G., Gubrium, J., Seale, C. and Silverman, D. (eds) in Qualitative research practice. Thousand Oaks, CA: Sage.

Marion, R. (1999) *The edge of organisation: chaos and complexity theories of formal social systems,* Thousand Oaks, California: Sage.

Mathews, K. M., White, M. C. and Long, R. G. (1999) 'Why study the Complexity Sciences in the Social Sciences?' *Human Relations,* 52 (4), pp. 439 – 462.

McDaniel, R. R. (2001) 'Complexity Science and Health Care Management', *Advances in health care management*, 2, pp. 11 – 36.

McDaniel R., and Driebe, D. J. (2001) 'Complexity Science and Health Care management', *Advances in Healthcare management,* (2), pp. 11 – 36.

MacDonald (2009) 'Independent Review of the proposal to make Personal, Social, Health and Economic (PSHE)', *Education England,* Available at: http://www.educationengland.org.uk/ (Accessed on: 12th October 2022).

McNamee, M. (2002) 'Introduction: whose ethics, which research?', in McNamee, M. and Bridges, D. (eds) *The ethics of educational research.* Oxford: Blackwell Publishers ltd. pp. 1 – 21.

Mireles-Rios, A. and Becchi, J. A. (2018) ; he Evaluation Process, Administrator Feedback, and Teacher Self-Efficacy', *Journal of School Leadership* , 28, pp. 462 – 487.

Miles, M. B. (1986) *Research findings on the stages of school improvement'* New York: Mimeo center for policy research.

Miller, A. (1995) 'Building Grounded Theory within educational psychology practice', *Educational and Child Psychology,* 12 (2), pp. 5 – 14.

Mitchell, L. (1999) *'Combining focus groups and interviews: telling how it is; telling how it feels*', in Barbour, R. S. and Kitzinger, J. (eds) *Developing focus group research: Politics, Theory and Practice.* London: Sage.

Moolenaar, N.M, Daly, A.J., Sleegers, P., and Karsten, S. (2014) 'Social forces in school teams: how demographic composition affects social relationships'. In D. Zandvliet, P. den Brok, T. and J. Van Tartwijk (eds) *Interpersonal relationships in education*, Maidenhead: Sense Publisher: Rotterdam.

Moos, L. and Kofod, K.K. (2009) 'Sustained successful school leadership in Denmark', *Journal of Educational Administration,* 47 (6), pp. 709 – 718.

Morgan, D. L. (1998) *Planning focus groups,* Thousand Oaks, California: Sage.

Morgan, D. (2012) 'Focus Groups and social Interaction', in Gubrium, J.F., Holstein, J. A., Marvasti, A. B. and McKinney, K. D. *The SAGE Handbook of Interview Research: The Complexity of the Craft.* London: Sage.

Morris, J., Lummis, G., Ferguson, C., Lock, G., Hill, S., Nykiel, A. (2020) 'Balancing school improvement strategies with workload pressures: a participatory action research case study', *Educational Action research.* Accessed at: Doi 10.1080/09650792.2021.2000878 (Accessed on: 19 September 2022).

Morrison, K. (2008) 'Educational Philosophy and the Challenge of Complexity Theory', *Educational Philosophy and Theory,* 40 (1), pp. 19 – 34.

Morrison, K. (2002) *School Leadership and Complexity Theory.* London: Routledge Falmer.

Morrison, K. (2001) *'Randomised controlled trials for evidence based education: some problems in judging 'what works'',* Evaluation and research in education, 21 (2), pp. 69 – 83.

Morrison, K. (1993*) Planning and Accomplishing School Centred Evaluation.* Dereham, UK: Peter Francis.

Mortimore, P. (1998) *The road to improvement: reflection on school effectiveness',* Netherlands: Swets and Zeitlinger.

Muijs, D. (2008) 'Widening opportunities? A case study of school-to-school collaboration in a rural district', *Improving schools,* 11 (1) pp. 3 – 96.

Muijs, D. and Harris, A. (2007) 'Teacher leadership in (in) action. Three case studies of contrasting schools', *Educational management and leadership,* 35 (1), pp. 111 – 134.

Muijs, D. and Harris, A. (2006) 'Teacher led school improvement: Teacher Leadership in the UK', *Teaching and Teacher Education,* 22, pp. 961 – 972.

Muijs, D. and Harris, A. (2003) 'Teacher leadership – Improvement through empowerment?: An overview of the literature', *Educational management administration and leadership'.* 31 (4), pp. 437 – 448.

Muijs, D., Harris, A. and Chapman, C. 'Improving schools in socioeconomically disadvantaged areas – A review of research evidence', *School effectiveness and school improvement,* 15 (2), pp. 149 – 175.

Muijs, D. and Reynolds, D. (2000) School effectiveness and teacher effectiveness: some preliminary findings from the evaluation of the Mathematics Enhancement programme, *School Effectiveness and School improvement: An international journal of research, policy and practice,* 11 (3), pp. 247 – 263.

Muijs, D., and Reynolds, D. (2011) *Effective Teaching: Evidence and Practice*, CA: Sage.

Mulgan, G. (2000) 'The Prospect of social renewal', in *The creative society of the 21st century*, Paris: OECD. pp. 133 – 172.

Nehez, J., Blossing, U., Gyllander Torkildsen, L., Lander, R. and Olin, A. (2021) 'Middle leaders translating knowledge about improvement: Making change in the school and preschool organisation', *Journal of Educational Change,* 23, pp. 315 – 341.

Newby, P. (2010) *Research Methods for Education.* London: Pearson.

Northouse, P. G. and Lee, M. (2016) *Leadership case studies in education.* Los Angeles: Sage.

Nunn, R. J. (2007) 'Complexity Theory applied to itself', *Complexity and Organization,* 9 (1-2), pp. 93 – 106.

O'Connor, K. and Boles, K. (1992) *'Assessing the needs of teacher leaders in Massachusetts',* Paper presented at the annual meeting of the American Educational Administration*,* San Francisco, CA: California Press.

Okilwa, N. and Barnett, B. (2016) 'Sustaining School Improvement in a high-need school: Longitudinal analysis of Robbins Elementary School (USA) from 1993 to 2016', *Journal of Educational Administration,* 55 (3), pp. 297 — 315.

Onwuegbuzie, Q. and Leech, N. (2006) 'On becoming a pragmatic researcher: the importance of combining quantitative and qualitative methodologies'. *International Journal of Social research methodologies.* 8 (5), pp. 375 – 387.

Opfer, V. and Pedder, D. (2011) 'The lost promise of teacher professional development in England', *European journal of teacher education,* 34 (1), pp 3 – 24.

Oppenheim, A. N. (1992) *Questionnaire design, Interviewing and attitude measurement.* London: Pinter.

Orton, J. D. and Weick, K. L. (1990) 'Loosely Coupled Systems: A Reconceptualization', *Academy of Management Review,* 15 (2), pp. 203 – 223.

Patton, M. Q. (1980*) Qualitative Evaluation Methods.* Beverly Hills, California: Sage.

Paley, J. and Eva, G. (2011) 'Complexity Theory as an approach to explanations in healthcare: a critical discussion'. *International Journal of Nursing. 48 (2), pp. 269 – 279.*

Pelage, A (2003) 'La redefinition du metler de chef d'establissement secondaire: changement statutaire, construction de l'engagement professional et epreuves pratiques' *Revue francaise de pedagogie, 145 (1), pp. 21 – 36.*

Penuel, W. R., Riel, M., Joshi, A., Pearlman, L., Kim, C.M., and Frank, K. A. (2010) 'The alignment of the informal and formal organisational supports for reform: Implications for improving teaching in schools'. *Educational Administration Quarterly,* 46 (1), pp 57 – 95.

Phillips, E. T., and Hamann, E. T., (2021) 'The Lady from North Carolina: The Perils and limitations of external expertise', *Anthropology and Education Quarterly,* 52 (3), pp. 335 – 351.

Plesk, P. E. and Greenhalgh, T. (2001) 'Complexity Science: The Challenge of Complexity in Health Care'*, British Medical Journal*, 323, (7313), pp. 625-628.

Pollock, K, Winton, S. (2012) 'School Improvement: A Case of Competing Priorities!', *Journal of Cases in Educational Leadership*, 15 (3), pp. 11–21.

Potter, J. A. (1998) *Grounded Theory in Comprehensive Clinical Psychology*, available at: Elsevier, (Accessed on: 2nd November 2022).

Prengar, R., Poortman, C. L., and Handelzalts, A. (2019) 'The effects of networked learning communities', *Journal of teacher education,* 70 (5), pp. 441 – 452.

Pring, R. (2015) *Philosophy of Educational Research*. London: Bloomsbury.

Pring, R. (2002) 'The Virtues and Vices of an educational researcher' in McNamee, M. and Bridges, D. (eds) *The ethics of educational research.* Oxford: Blackwell Publishers Ltd. pp. 111 – 126.

Puddephatt, A., J. (2006) 'Special: An interview with Kathy Charmaz: On Constructing Grounded Theory', *Qualitative Sociology Review,* 11 (3), pp. 5 – 20.

Punch, K. F. (2009) *Introduction to Research Methods in Education.* London: Sage.

Quintelier, A., Vanhoof, J. and DeMaeyer, S. (2018) 'Understanding the influence of teachers' cognitive and affective responses upon school inspection feedback acceptance', *Educational Assessment, Evaluation and Accountability,* 30, pp.399– 431.

Ramatlapana, K. A. (2009) 'Provision of in-service training of mathematics and science teachers in Botswana: teachers' perspectives', *Maths teacher education,* 12, pp. 153 – 159.

Reeves, J. and Drew, V. (2012) 'Relays and relations: tracking a policy initiative for improving teacher professionalism', *Journal of Education Policy*, 27 (6), pp. 711-730.

Reierson, C. A. and Becker, S. R. (2021) 'Coherent school improvement: Integrating outcomes-based assessment and trauma-informed practice', *Improving Schools,* 24 (2), pp.124 – 136.

Rittel, H. W. J., and Webber, M. M. (1973) 'Dilemmas in a General Theory of Planning Author', *Policy Science*s, 4 (2), pp. 155-16.

Robinson, V. M. J., Lloyd, C. A., and Rowe, K.J. (2008) 'The impact of Leadership on student outcomes: an analysis of the differential effects of leadership types', *Educational Administration Quarterly,* 44 (5), pp. 318 - 329.

Rose, 2006, 'Independent review of the approach to teaching reading'. Accessed at: untitled (ioe.ac.uk) (Accessed on: 2nd November 2022).

Sainsbury, R. and Corden, A. (2006) 'Exploring 'Quality': Research participants' perspectives on verbatim quotations', *International Journal Social Research Methodology,* 9 (2), pp. 97 – 110.

Sarantakos, S. (2012) *Social research,* Basingstoke: Palgrave Macmillan.

Saxl, E., Miles, M. B., and Liberman, A. (1989) *Assisting change in education: a training program for school improvement facilitators,* New York: Centre for Policy research.

Schapp, H. and de Bruijin, E. (2018) 'Elements affecting the development of professional learning communities in schools', *Learning Environment Research,* 21, pp. 109 – 134.

Scheerens, J. (2015) 'Theories on educational effectiveness and ineffectiveness', *School Effectiveness and School Improvement,* 26 (1), pp. 10 – 31.

Schein, E. H. (1988) *Process consultation, Volume 1: Its role in organization development,* Wokingham: Addison Wesley.

Scott, D. (2016) Interpretivism as a Theory of knowledge, in D. Wyse, D. Selwyn, N. Smith, E. and Suter, L. E. *The BERA/SAGE Handbook of educational research*. Los Angeles: Sage publications.

Seidman, I. (2006) *Interviewing as Qualitative Research*. Columbia University, OH: Teachers College Press.

Sergiovanni, T. (2000) *The lifeworld of leadership,* London: Jossey-Bass.

Shadish, W. R., Cook, T.D., and Campbell, T. D. (2002) *Experimental and Quasi-experimental designs for generalised causal inference.* Boston, MA: Houghton Mifflin Company.

Shaked, H. and Schechter, C. (2020) 'Systems thinking leadership: New explorations for school improvement', *Management in Education,* 34 (3), pp. 107 – 114.

Sharrat, L. and Fullan, M. (2009) *Realization: The Change Imperative for Deepening District Wide Reform.* San Francisco, CA: Corwin Press.

Sinha, S. and Hanuscin, D.L. (2017) 'Development of teacher leadership identity: a multiple case study', *Teaching & Teacher Education*, 63, pp. 356-371.

Sleegers, P. J. C., Thoonen, E. E. J., Oort, F. J., and Peetsma, T. T. D. (2014) 'Changing classroom practices: the role of school-wide capacity for sustainable improvement'. *Journal of Educational Administration.* 52 (5), pp. 617 – 652.

Smith, J. A. (2013) 'Structure, Agency, Complexity Theory and Interdisciplinary Research in Education Studies', *Policy Futures in Education,* 11 (5), pp. 564 – 574.

Solow, D., and Szmerekovsky, J. G. (2006) 'The Role of Leadership: What Management Science Can Give Back to the Study of Complex Systems', *Emergence: Complexity & Organisation*, 8, pp. 52-60.

Spillane, J.P., Hopkins, M., Sweet, T. (2015) 'Inter- and interschool interactions about instruction: Exploring the conditions for social capital development'. *American Journal of Education,* 122 (1), pp. 71 – 110.

Stacey, R. D. (2000) *Managing the Unknowable.* San Francisco: Jossey Bass.

Stacey, R. D, Griffin, D. and Shaw, P. (2000) *Complexity and management: fad or radical challenge to systems thinking.* Abingdon: Taylor and Francis Ltd.

Stewart, D. W. and Shamdasani, P. N. (2015) *Focus Groups Theory and Practice.* London: Sage.

Stringer, P. M. (2009) 'Capacity building for school improvement: a case study of a New Zealand primary school'. *Educational Research for Policy and Practice,* 8, pp. 153 – 179.

Stuyve, C., Meredith, C. and Gielen, S. (2014) 'Who am I and where do I belong? The perception and evaluation of teacher leaders concerning teacher leadership practices and micropolitics in schools', *Educational Change,* 15, pp. 203 – 230.

Suddaby, R. (2015) 'Editor's Comments: Why Theory?', *Academy of Management Review: Supplement,* 4015 (1), pp. 1 – 5.

Supowitz, J. (2008) 'Melding Internal and External Support for School Improvement: How the District Role Changes When Working Closely with External Instructional Support Providers', *Peabody journal of education*, 83, pp.459 – 478.

Swaffield, S. (2015) 'Support and challenge for school leaders: Headteachers' perceptions of school improvement partners'*, Educational Management Administration & Leadership*, 43 (1), pp. 61 – 76.

Taylor, J. and Nguyen, A. N. (2006) 'An Analysis of the Value Added by Secondary Schools in England: Is the Value-Added Indicator of Any Value?' *Oxford Bulletin of Economics and Statistics,* 68 (2), pp.203 – 224.

Teacher Support Network (2014) *Inspection survey results.* Available at: https: teachersupport.info/inspection-survey-results-teacher-support-network-were-a-charity-please-donate/ (Accessed on 21st December 2021).

The Office for Standards in Education (2021) 'Inspection of Abbot's Lea School', Available at: [Ofsted | Abbot's Lea School](#) (Accessed on 22nd October 2022).

The Office for Standards in Education and Skills (2019) *Ofsted is changing how it inspects schools*, Available at: [Ofsted is changing how it inspects schools - GOV.UK (www.gov.uk)](#) (Accessed on: 20th March 2022).

The Office for Standards in Education, Children's Services and Skills. (2014) *Ofsted: About us.* Available at: https: [www.gov.uk/government/organisations/ofsted/about](#) (Accessed on: 29th December 2021).

Thompson, D. S., Fazio, X., Kustra, E., Patrick, L. and Stanley, D. (2016) 'Scoping review of complexity theory in health services research'. *BMC Health Services Research.* 16 (87), pp. 1 – 16.

Thrupp, M. (2015) *School improvement: an unofficial approach'.* London: Continuum.

Tomlinson, (2005) *Education in a post-welfare society*, Abingdon: Open University Press.

Tuckman, B. W. (1972) *Conducting Educational Research.* New York: Harcourt Brace Jovanovich.

Tuffin, R. (2016) 'Implications of Complexity Theory for clinical practice and healthcare organisation'. *British Journal of Anesthesia,* 16 (10), pp. 349 – 352.

Tulowitxki, P. (2012) 'Leadership and school improvement in France', *Journal of Educational Administration, 51 (6), pp. 812 – 835.*

Turner, J. R. and Baker, R. M. (2019) 'Complexity Theory: An Overview with Potential Applications for the Social Sciences', *Systems,* 7 (4), pp. 1 – 22.

Vanblaere, B. and Devos, G. (2018) 'The Role of Departmental Leadership for Professional Learning Communities', *Educational Administration Quarterly,* 54 (1), pp. 85 – 114.

Van de Grift, W. (2009). 'Reliability and validity in measuring the value added of schools'. *School Effectiveness and School Improvement*, 20 (2), pp. 269-285.

Vu, J. A., Han, M., and Buell, M. J. (2015) 'The effects of in-service training on teachers' beliefs and practices in children's play', *European Early childhood education research journal,* 23 (4), pp. 444 – 460.

Wasley, P. A. (1991) 'From quarterback to coach, from actor to director', *Educational Leadership,* 48 (8), pp. 35 – 40.

Watts, M. and Ebbutt, D. (1987) 'More than the sum of the parts: research methods in group interviewing', *British educational research journal*, 13 (1), pp. 25 – 34.

Weber, M. (1949) *The methodology of the social sciences.* Glencoe: Free Press

Weick, K. E. (1976) 'Educational Organizations as Loosely Coupled Systems', *Administrative Science Quarterly,* 21, pp. 1 – 19.

Wenger, E. (1998) *Communities of Practice: learning, meaning and identity*. Cambridge: Cambridge University Press.

Wengraf, T. (2001) *Qualitative Research Interviewing.* London: Sage.

Wendt, D. (2012) 'Visibility, Availability, Credibility School Personnel and Community Involvement', *The Education Digest.* Available at: ERIC - EJ981723 - Visibility, Availability, Credibility: School Personnel and Community Involvement, Education Digest: Essential Readings Condensed for Quick Review, 2012-Mar, (Accessed on: 18th October 2022).

Wenner, J.A. and Campbell, T. (2017) 'The theoretical and empirical basis of teacher leadership: a review of the literature', *Review of Educational Research*, 87 (1), pp. 134-171.

Western, S, (2012) 'An overview of the Leadership discourses', in Preedy, M., Bennett, N. and Wise, C. (eds) *Educational leadership: context, strategy and collaboration.* London: Sage.

Wettlaufer, J. and Sider, S. (2019) '"How Can He Be So Cruel?" Examining Issues of Trust in School Improvement Efforts', *Journal of Cases in Educational Leadership*, 22 (2), pp. 3–13.

White, D. and Levin, J. (2016) 'Navigating the Turbulent Waters of School Reform Guided by Complexity Theory' *Research gate,* Available at: DOI:10.29173/cmplct24566 (Accessed on: 27th October 2022).

Wood, P. and Butt, G (2014) 'Exploring the use of Complexity Theory and Action research as frameworks for curriculum change'. *Journal of curriculum studies, 46* (5), pp. 676 – 696.

Wrigley, T. (2003) *Schools of hope.* Stoke on Trent, United Kingdom: Trentham books.

Wullschlegar, A., Rickenbacher, A., Rechsteiner, B., Grob, U., Maag Merki, K. (2022) 'School teams' regulation strategies for dealing with school-external expectations for school improvement', *Research in Education,* 0 (0), pp. 1 – 23.

York-Barr, J. and Duke, K. (2004) 'What do we know about teacher leadership? Findings from two decades of scholarship', *Review of Educational Research*, 74 (3), pp. 255-316.

Youngblood, M. D. (1997) *Life at the Edge of Chaos.* Dallas: Perceval Publishers.

Yurkofsky, M. (2022) 'From Compliance to Improvement: How School Leaders Make Sense of Institutional and Technical Demands When Implementing a Continuous Improvement Process', *Educational Administration Quarterly,* 58 (2), pp. 300 – 346.

Appendices

Appendix 1: Information shared with participants

UNIVERSITY OF
GLOUCESTERSHIRE

Information for participants

Katie Cook 2020

Thank you for considering to participate in my research project.

The project seeks to understand teacher views on school improvement. This is because much of the research into school improvement has not focused on teachers' viewpoint.

You will be asked to take part in a set of interviews or in a focus group conversation. Direct quotes will be used in the thesis. The thesis is a written document outlining my research and the findings. The thesis is my contribution to my PhD. It will be published and remain in the public domain.

All attempts will be made to keep the teachers (participants) anonymous. There is the potential that you could be recognised by those who know you well from what you say and the situations you describe. No names of schools or individuals will be recorded in the final thesis.

The individuals will take place with just one teacher and the researcher. The focus groups will be a group of six teachers discussing some of the findings from the interviews. I would ask that everything discussed in the focus group remains confidential.

Each participant will have the opportunity to withdraw from the research and/or withdraw their comments from the final thesis.

If you have any further questions about the research I am undertaking, or how it will be presented, please do not hesitate to ask.

Katie Cook

Appendix 2: Interview consent form

Research Question: What can we learn from teachers about school improvement?

<u>Voluntary Consent</u>

Participants will be requested to participate in up to six 1:1 semi structured interviews to discuss school improvement.

The interviews will be audio recorded and these recordings will be kept until the end of the study (for approximately 3 years from the interview).

The interviews will be transcribed by the researcher who will use pseudonyms to ensure confidentiality. All transcripts will be kept in a locked drawer in a locked office and will be destroyed at the end of the study. Documents available within the public domain (such as National Policy documents and Ofsted reports) may be used when referred to within an interview.

I would like your permission to include the results and key findings from this research in the final thesis. At the end of the study the research may be available in the public domain.

The study will follow the Ethical Guidelines as set out by the University. All participants will be guaranteed confidentiality and where possible anonymity. Due to the small-scale nature of the research it may be possible to identify individuals by the comments they make and therefore opportunities for individuals to have comments removed from the research will be given. All research materials will be kept by the researcher and only used for the purpose of the study. The only exception to this will be in the likely event that any concerns about illegal activities, abuse or neglect are raised, as I am legally required to report this.

Schools and individuals will not be identified in the thesis.

Data Protection Legislation (2018) will be adhered to at all times.

You are free to withdraw your permission at any time during the study. The study will take place between September 2020 and January 2023.

You are able to contact me on ---or you can contact the University of Gloucestershire (Francis Hall Campus, Swindon Road, Cheltenham, GL50 4AZ) if you have any concerns.

Consent:

I have read this form and the research study has been explained to me. I agree to participate in this research study.

_____ (participant) Date

_____ (researcher) Date

Appendix 3: Focus group consent form

Research Question: What can we learn from teachers about school improvement?

<u>Voluntary Consent</u>

Participants will be requested to participate in a focus group to discuss school improvement.

The focus will be audio recorded and these recordings will be kept until the end of the study (for approximately 2 years from the focus group conversation).

The focus group will be transcribed by the researcher who will use pseudonyms to ensure confidentiality. All transcripts will be kept in a locked drawer in a locked office and will be destroyed at the end of the study. Documents available within the public domain (such as National Policy documents and Ofsted reports) may be used when referred to within an interview.

I would like your permission to include the results and key findings from this research in the final thesis.   At the end of the study the research may be available in the public domain.

The study will follow the Ethical Guidelines as set out by the University. All participants will be guaranteed confidentiality and where possible anonymity. Due to the small-scale nature of the research it may be possible to identify individuals by the comments they make and therefore opportunities for individuals to have comments removed from the research will be given. All research materials will be kept by the researcher and only used for the purpose of the study. The only exception to this will be in the likely event that any concerns about illegal activities, abuse or neglect are raised, as I am legally required to report this.

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You are able to contact me on --or you can contact the University of Gloucestershire (Francis Hall Campus, Swindon Road, Cheltenham, GL50 4AZ) if you have any concerns.

Consent:

I have read this form and the research study has been explained to me. I agree to participate in this research study.

_____ (participant) Date

_____ (researcher) Date

Appendix 4: Ethics approval letter

UNIVERSITY OF GLOUCESTERSHIRE

Dr Colin Forster
Research Ethics Lead
School of Education and Humanities

Tel: +44 ███████████
Email: ████████████

Katie Cook
Thursday 28th May 2020
Via email

Dear Katie,

Thank you for your application for ethical approval.

I am pleased to confirm ethical clearance for your research following ethical review by the Research Ethics Panel of the School of Education and Humanities.

Please keep a record of this letter as a confirmation of your ethical approval.

Project Title: What can we learn from teachers about School Improvement?

Start Date: September 2020

Projected Completion Date: January 2023

SREP Approval Code: EDU20206

If you have any questions about ethical clearance please feel free to contact me. Please use your School Research Ethics Panel Approval Code in any future correspondence regarding this study.

Good luck with your research project.

Regards,

Dr Colin Forster
School of Education and Humanities Research Ethics Lead

Appendix 5: Example of initial and secondary coding and Question set A (Agents and Interdependencies)

Interview: AI:1.1 (Agents and Interdependencies: Participant 1. First Interview)

Thank you for agreeing to be interviewed. This my first interview so bear with me (inaudible). Are yu happy to get started? Pause.

Can you tell me about your professional career in teaching so far?

I qualified in 2001 and have been at the same school ever since (laughs). I only wanted to be a teacher. I didn't want to be a deputy or anything. I love being in the classroom. I always wanted to be in Reception but I love nursery too now. I have done it for years. I don't want to move or do anything else (laughs).

Thank you. Can you tell me about your role or roles in school?

Time

I lead the Early Years team, so that's, one, two (counts in head) six staff. I supported the NQT in the other class last year. I have been art leader forever. I don't think anyone else wants to do it (laughs). I did it at university and always loved art. I wish I had more time. Oh, and also DT. They often put those together.

You said that you Lead Art in school. Can you explain a little more about what that involves?

Yes. I had to start with a scheme......oooo. about 10 years, well a long time ago. I have changed that as things have changed, as we have gone on. It is hard for some people to do art so I tried to make it easy for them. Give them lots of ideas. We had artists on once, om a TD day. I don't think the staff who are here now were here then (laughs). Oh I should have thought of that. I suppose I can be there to help people if they want. They might look in my class for ideas. I should do staff meetings and check what people are doing. We review our subject each year. If we have had a chance to monitor it – you know look at work and stuff. That's harder for art as it is on display not in books like maths or others....subjects. I think that's it (thinks). Oh I haven't mentioned DT. I don't do as much for that. I just check people are doing the scheme – the curriculum. I guess I don't know so much about it.

I would now like to find out about how you feel about school improvement.

How do you think you contribute to improving the school?

I'm not sure I do (laughs and then stops to think). I said I helped the NQT. She needed a lot of support to start with. We planned together and I helped her with the assessment as that is different everywhere. Sometimes with parents too as they can be tricky here. I wasn't the only one. Other people helped her too.

Can you tell me more about why you think other people helped?

He would go to others for advice. You know, if they weren't sure or I was busy. We planned together so that probably was a big help. I hope so anyway. He had training to go to outside of school. I think some were NQT days and some other things (names Head) put him on. He did OK. It is hard so I tried to help or it can be overwhelming. Erm, his mentor helped with the more official things like the paperwork and making sure things wee done in time. She would give him advice after lesson observations but not day to day. We all have help in progress meetings from her because she is on SLT so we all sit together.

How else do you contribute to school improvement?

1

Interview: AI:1.1 (Agents and Interdependencies: Participant 1. First Interview)

Like with Art and DT. I m there for advice and also to make suggestions if I look at planning or in lessons. That doesn't happen too much. Not as much as in other subjects.

Can yu give me an example?

Well, in English and maths. That's the focus isn't it? They get time and have to do staff meetings and TD days themselves. They might go on courses and bring information back we have to do. That sort of thing. Its not so much in my subjects. Erm, I think people see me as experienced as I have been here so long but as I am in Early years, well nursery, not so much. Other people get asked to do more.

This appears to be because of your role in school. Can you tell me more [ ] case and why you might think that?

EXP / credibility.

Because we are separate. In nursery and reception really. I do support everyone in here, like Tas and stuff – or if we have people in to watch us from other schools. That happens because we have all worked together so long. Everyone just knows what to do. But if we get someone new, like the NQT I deal with it. Or if there are problems with staff then it is me. Or if we need to ask names Head) something then I go.

Do you think this is a result of the formal roles you have in school or because of something else?

Something else. It's about who you get on with and who says to someone else 'go and see so and so'. It is sometimes about your leadership role, like if its an art question but mostly just who feels comfortable with you. I might be able to suggest things to make things better but only to help them not formally. Not written down anywhere, I think that is important too.

Can you tell me about who you think has the power to make change in schools?

The Head, the deputy. They decide. SLt get asked. Some strong personalities might get their way. The data. That decides most things. Also (names a person). She does,

Personalities

Who is (names person)?

Err our erm, school development person who comes in. School improvement, that's it (laughs). She will say to the Head what she thinks we should do and then we do that. Sometimes we don't know that is what was said an sometimes we do. That helped with Ofsted last time. Well not me, they didn't speak to me.

AB

Power.

You mentioned SIP. How do they impact on school improvement?

They do the Ofsted training and tell us what the focus is. What's the buzz words. Then we know to get prepared. I'm sure they do more than that but I don't know, I don't get involved. You know…

You mentioned the Head and Deputy. How do they impact on school improvement?

They write our school plan and share the responsibilities. I think they and other SLT say whether it has been achieved. The Governors see it. I know that. Sometimes I think they are told what to do not deciding. I don't know maybe it just seems that way. You know, Ofsted tell us or someone from the local authority.

You mentioned SLT. How do they impact on school improvement?

2

Interview: AI:1.1 (Agents and Interdependencies: Participant 1. First Interview)

They take the ideas and do them with the staff. They each have areas they are responsible for, like English or KS1 or a year group. Then they do what is needed and report back. They will say of things aren't possible. Or maybe they can't be done, like it is not practical. They will take our ideas back too as to what we think. Also training. They sometimes do training with us. The SENCo did some on Autism as that was something in our school that we needed help with. That's improvement. Improving things for those children and everyone really.

You mentioned Governors. How do they impact on school improvement?

They come in every year and meet with staff. So if they are responsible for Safeguarding they meet with the DSL and everything like that. They should know what we are improving. So this year it has been maths. They should know that and what we are doing. The head reports to them too. She will say what improvements are needed and what we will do. I don't go to meetings so I am not sure what else.

Thank you. You have mentioned some of the people that you work with and I would like to find out more about how people work together to make improvements in schools.

Can you tell me about some of the people involved in school improvement in the school you have worked in?

Well... different examples...erm. I'm not sure.

Can you give me an example of something that happened to improve a school, thinking in particular about who was involved?

OK. So we had a maths person in. Is that what you mean?

Yes.

So she came in and did some training. On number and calculation. I'm not sure why but I think it was on our school improvement plan. We then had some things to go and do. Not so much for us in nursery but still some things. Its harder really cos we have to make it relate to us. The we all went away and did it. The matsh lead would check ourplanning and check what was happening. Not much more happened after that. The lady cam back, erm (says name) I think was her name. She came back and we did more training. I think that was for school improvement.

Was anyone else involved?

==Understanding outcomes.==

No I don't think so. I guess the Head must have agreed it. Not sure of anyone else. I know we talked about it in the staff room about how we were going to put it in our planning – you know – to tick a box (laughs). I think everyone does that.

Are there any other professionals or stakeholders who might get involved in school improvement?

No I think I have said everyone. Ofsted. But we don't want to talk about them.   A.B .

Can you think of a time you worked with others on a school improvement project?

I don't think I have. No. No don't think so.

Have you got a different example where different people worked together?

We work together in our teams. Our planning teams. So in year groups. Every week in PPA. If there is some feedback someone has been given then we discuss that and how we can do it. We work well

3

==Internal / External foo==

as a team but tat s more on things we want to do or to improve. Things the children need rathe than what someone else has decided. That's what makes things better. I think anyway. I

Thank you for taking the time to speak to me today. Let me briefly summarise the information I have recorded in the interview.

Summarised key points:

Yes that's it.

Closing:

Closing:

Is there anything else you would like me to record today about the people involved in school improvement in the schools you have worked in?

No I don't think so. I hope that is OK?

That's perfect. Thank you. This should be all the information I need. I look forward to talking to you again next time.

Yellow = agents.
Brown = temporality
Black (BP) = Bifurcation Point.
Green = Connectivity
Orange = temporality
 * = self organisation.
AB = Authoritative Bodies
P = Power.
H = hierarchy.   I = impact

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Appendix 6: Interview question set B – Emergence, temporality, and feedback loops

Opening:

Thank you for coming. Last time we met we talked about

Today I would like to ask some questions about how schools improve. What that looks like and what you have experienced.

I hope to use this information to support my understanding of how schools improve, what takes place and how teachers experience school improvement. The interview should take about 40 minutes. Are you happy to continue?

Transition:

Let me start by asking you about why changes happen in schools.

Part One: Initial conditions/starting points:

1. Can you give me some examples of why your school has experienced change to improve something?

    Possible question probes:
    a. Consider whether outcome is academic performance related or other.
    b.   What do you think prompted the change?
    c. Who?
    d. What happened after that?
    e. Successes?

2. Do you think anything else was impacted by the changes/*?

    Possible question probes:
    a.   How did * impact on *?
    b. Who?
    c. What happened?
    d. Outcome? Successes?

3. You have described some examples of school improvement where the objective was to improve academic outcomes. Can you give me an example of another type of school improvement and why it happened?

    Possible question probes:

    a.   What made someone feel there was a need for change?

Transition:

Part Two: Educational Landscape

So, we have thought about why change needs to happen now I want to think about what Education looked like at the time?

4. Thinking back to the example you just gave me (or another example) of change, was there anything happening in education at the time?

Possible question probes:

    a. Ofsted Inspection Handbook
    b. New policy
    c. Government change
    d. New initiatives

Transition:

Part Three: Time and Emergence

Thinking about this change and improvement that occurred, I would like to consider what that looked like over time.

    5. What happened at the beginning of *
    6. What happened next
    7. Would you say the improvement strategy you described finished or has it remained?
    8. Can you give an example of where this is not the case?
    9. Can you give me some examples of what happens in schools to make them change what they do or how they run?

        Possible question probes:
        a. Are these formal or informal starting points?
        b. If formal, is there any documentation related to this? Ofsted, Government documents?
        c. Who?

    10. I am interested in how change occurs over time. Do you think time is an important factor in school improvement and if so, why?

        Possible question probes:
        e. How did time impact on outcomes of the changes/the improvement seen?
        f. If no, can they explain why?

    11. What were the challenges you and the school faced?

    12. So you mentioned * (state of equilibrium) what happened next?

Transition:

Part Four: Feedback loops

It could be argued that school improvement isn't sustainable, or it doesn't last.

    13. What do you think about this?

    14. You mentioned *, was this every revisited or come back to? Or consider another example the participant has given and use this to consider feedback loops.

Transition:

Thank you for taking the time to speak to me today. Let me briefly summarise the information I have recorded in the interview.

Summarise key points:

Closing:

Is there anything else you would like me to record today about school improvement in the schools you have worked in?

This should be all the information I need. I look forward to talking to you again next time.

Clarify arrangements for the next interview.

Appendix 7: Interview question set C – Equilibrium and bifurcation point

Opening:

Thank you for coming. Last time we met you gave me some examples of school improvement in your school. Today I would like to find out about why school improvement happens.

The interview should take about 40 minutes. Are you happy to continue?

Transition:

Let me start by asking you about a change that happened in your school and why the change happened.

Part One:

1. Can you think of a school improvement strategy and what prompted the change?

2. Why do you think the change in multiplication had to happen and do you think this was the right decision?

3. What was ****** (refer to example given) like before this change took place.

Part Two:

1. Can you describe what school was like prior to the change?
2. Can you describe what **_name the area the strategy was set to improve_ was like before the change?
3. What was it like after the change?

Summarise key points: Can I clarify that the change happened because of x and before x this was how it was?

Closing:

Is there anything else you would like me to record today about school improvement in the schools you have worked in?

This should be all the information I need. I look forward to talking to you again next time.

Clarify arrangements for the next interview.

Appendix 8: Interview question set D - Self-organisation and loose coupling

Opening:

Thank you for coming. Last time we met we talked about the people involved in School Improvement.

Today I would like to ask some questions about how colleagues work together to improve schools, what that looks like and what you have experienced.

I hope to use this information to support my understanding of how schools improve, what takes place and how teachers experience school improvement. The interview should take about 40 minutes. Are you happy to continue?

Loose Coupling and Self-Organisation

15. In your example * you mentioned that * introduced/trialed/encouraged *. Can you tell me about how these people worked together to get the outcome you described?

    Possible question probes:
    a. How did those people become involved?
    b. Can you give me an example of how this happened?
    c. Why do you think * and * did *?

16. How did that feel?

    Possible question probes:
    a. Consider Power, relationships and how they now perceive school improvement.

17. Can you give me another example where professional relationships have developed due to school improvement?

    Possible question probes:

    a. Describe the situation and what happened.
    b. How?

18. Do you think the professional relationships you have described have impacted on school in any other way?

19. You mentioned that * (people's names/people's job roles) worked together on *. Is this typical of how people work together?

Possible question probes:

a. Same people/roles?

    b. Clarify any patterns that appear.

    20. How did those colleagues go on to work together again?

Transition:

Thank you for taking the time to speak to me today. Let me briefly summarise the information I have recorded in the interview.

Summarise key points:

Closing:

Is there anything else you would like me to record today about school improvement in the schools you have worked in?

This should be all the information I need. I look forward to talking to you again next time.

Clarify arrangements for the next interview.

Appendix 9: Interview question set E - Spontaneity, unpredictability and non-linear systems

Opening:

Thank you for coming. Last time we met we talked about *

Today I would like to ask some questions about how schools improve. What that looks like and what you have experienced.

I hope to use this information to support my understanding of how schools improve, what takes place and how teachers experience school improvement. The interview should take about 20 minutes. Are you happy to continue?

Transition:

Let me start by asking you about changes that you have experienced in schools that were not planned for.

1. In some schools they use a School Development Plan or a similar document. Can you describe a time when improvement happened, and it wasn't planned for in a document such as this?

    Possible question probes:

    a. What prompted the change or * to happen?
    b. Tell me more about how other people got involved in *.
    c. Outcomes?

Transition:

Thank you. Now I'd like to think about what changed because of the improvement.

2.   You have mentioned *. When this happened what was the result of that, and did you expect it?
    Possible question probes:

    a. Did anything else that wasn't planned for happen as a result?
    b. What was other people's response to this?

Transition:

Now I would like to think about whether school improvement can be predicted.

3.   Thinking about the example you have just given (where improvement happened that wasn't formally planned for), could you have predicted the outcome?

Possible question probes:

a.   Can you tell me about any other outcomes that you could or couldn't have predicted?

b. Did anything unexpected happen because of the changes that were made or the relationships that were built?

c. Can you describe a more formal or planned response to an area of improvement in the school where the outcomes could have been predicted and were there any outcomes that couldn't be predicted?

4. What were the challenges because of the unpredictable nature of what you have described?

Non-linear:

5. So, do you think that school improvement can be described in a linear way?

6. Can you give an example of this?

7. Do you think that there is a beginning and an end to an area of school improvement and can you describe why this is or isn't the case?

8. Is the point between the starting point and end points that you describe, a straight line – tell me more?

Transition:

Thank you for taking the time to speak to me today. Let me briefly summarise the information I have recorded in the interview.

Summarise key points:

Closing:

Is there anything else you would like me to record today about school improvement in the schools you have worked in?

This should be all the information I need. I look forward to talking to you again next time.

Clarify arrangements for the next interview.

Appendix 10: Interview question set F - The whole is greater than the sum of its parts.

Opening:

Thank you for coming. Last time we met you gave me some examples of school improvement in your school. Today I would like to find out about the outcomes of school improvement strategies.

I hope to use this information to understand more about how a school develops through the changes put in place as part of its school improvement. The interview should take about 40 minutes. Are you happy to continue?

Transition:

Let me start by asking you about a change that happened in your school and what the outcomes were.

Part One: the whole is greater than the sum of its parts

4. You have mentioned previously *. What was the outcome of that on staff and pupils? Was anyone else impacted?
    a. How could the impact of been greater?
    b. Why wasn't there impact?
    c. What could have been different?

5. You told me about * why do you think the impact or outcomes were in your words *(good/strong/poor).
6. Was there any lasting outcome from this.
7. Can you give me another example where the outcomes were the opposite to what you have described?
8. Which is the most likely in terms of the impact of school improvement strategies?
9. Is there a difference between those that are formally planned for (e.g. on the SDP) and those that are not?

Transition:

Part Two: Sustainability

I would like to think about whether the changes you have described are sustainable or whether they could be?

10. Can you tell me about whether you think school improvement can be sustainable?

Possible probes:

a. Why is that?

Part Three: Unpredictability

11. Thinking about what you said about the outcomes above. Do you think this was predictable?

Possible probes

    a. If not, why?
    b. If yes, why

12. Do you think that you can predict the outcomes of School improvement
13. How does unpredictability impact on School improvement?

Transition:

Thank you for taking the time to speak to me today. Let me briefly summarise the information I have recorded in the interview.

Summarise key points:

Closing:

Is there anything else you would like me to record today about school improvement in the schools you have worked in?

This should be all the information I need. I look forward to talking to you again next time.

Clarify arrangements for the next interview.

Appendix 11: Interview question set G - Complexity Reduction.

Opening:

Thank you for coming. I would like to talk today about the theory I am using in my study and what that might mean for school improvement.

The interview should take 20 minutes. Are you happy to continue?

Transition:

The theory I am using in my study suggests that we shouldn't put boundaries on, in this case, school improvement, because it can prevent the system or the school from changing as much as it could.

Part One: Boundaries

14. Can you think of any on school improvement strategies, and can you describe them?
15. Did these have a positive or negative impact and why?

Possible probes:

a. On whom or what?

Transition:

Part Two: Limitations to school improvement

I would like to think now about whether school improvement always happens as planned.

16. Do you think all the actions, or strategies put in place had the outcomes that were expected?

Possible probes:

a. If so, why, or why not.
b. Do the boundaries get in the way?
c. What prevents the outcomes being positive (if there are negative outcomes).

Transition:

Thank you for taking the time to speak to me today. Let me briefly summarise the information I have recorded in the interview.

Summarise key points:

Closing: Is there anything else you would like me to record today about school improvement in the schools you have worked in?

This should be all the information I need. I look forward to talking to you again next time.

Clarify arrangements for the next interview.

Appendix 12: Interview question set Connectivity and Interconnectivity.

Opening:

Thank you for coming. We discussed before about the people that were involved in or supported you in (name aspect) of school improvement. I would like to find out today about how these people connect together, about relationships and how strong these relationships are.

The interview should take about 40 minutes. Are you happy to continue?

Transition:

Let me start by reminding you of a school improvement strategy you have discussed with me before.

Part One:

17. The people involved in the strategy were x. Thinking about them who would you say you had the strongest working relationship with prior to the strategy?
    d. After the strategy?
18. Did any of the relationships change as a result of the strategy and can you tell me how?
19. How did this impact on that school improvement strategy and did that relationship impact on school/on pupils in any other way?
20. Did you make any other connections as a result of x or did anyone else?
21. How did that impact on school?
22. Were there any relationships of connections made that no longer support you in your role?
23. Why is this?
24. Did you like this way of working or do you think there have been more successful ways of building relationships to bring about change?
a. What are these?
b. How would you describe these connections?

Summarise key points: Can I clarify that the change happened because of x and before x this was how it was?

Closing:

Is there anything else you would like me to record today about school improvement in the schools you have worked in?

This should be all the information I need. I look forward to talking to you again next time.

Clarify arrangements for the next interview.

Appendix 13: Focus Group Transcript

Opening:

Thank you for coming. We have discussed the consent form already and are you happy to continue? Thank you for taking part.

I would like to ask you to discuss school improvement and I have some prompts that I may interject with as the discussion progresses.

I hope to use this information to support my understanding of how schools improve and to help me better understand the information I have collected in interviews with teachers.

The discussion should take about 40 minutes. Are you happy to continue?

Transition:

1. Let me start by asking you about your roles in school.

Teachers went around the circle giving their names and job titles.

Prompts related to the emerging theory.

1. **Thank you. What would be the impact you think school improvement has on you, your colleagues. other stakeholders and the pupils?**

Teacher 3: It is often the Senior leaders that do the school improvement, but it affects everyone. If we have something new to try, then generally it is for everyone. Or a key stage.

Teacher 4: But sometimes we must lead it. I taught the staff about trauma informed. That was on the school improvement plan. I'm not senior leadership but I did that.

Teacher 3: That's because you work with everyone. Everyone knows you well. They believe what you say is right.

Teacher 4: And I said that if it didn't go right, because I get the trauma informed … way… wrong sometimes. Then that is OK.

Teacher 3: Yeah… that it is OK to make mistakes, and everyone knew that you would help them or be fine with it. What I mean is that it isn't the teachers who decide.

Teacher 4: What to do?

It sounds like you are trying to say that you need the support from your colleagues?

Teacher 3: Yes.

Teacher 2: But also, you need to trust the people telling you to change.

Teacher 3: Yes. Not like, oh, remember (says name).

Teacher 4: (laughs and repeats name). It is difficult to agree with someone who hasn't worked in a school for so long. Things have changed and we do things

differently. Maybe they should come and work here for a while and then they would see what we do. That's what I wanted to say.

Teacher 2: That goes back to trust. You need to trust the person and that doesn't happen overnight. Unless its Ofsted and you have to trust them!

Teacher 3: The problem was that 'all she has to focus on is maths. She is brilliant and really helps us to understand. We have so many hats. So many things to think about. It is great to have an expert… just maths'.

Teacher 6: That would be nice. Just to have maths to think about (laughs)

(Others laugh).

Teacher 1: Ofsted … (interrupted by)

Teacher 3: I don't know that I trust Ofsted. I believe that they know. I mean *Ofsted help us decide where the focus should be…based on research, newest research. Is that trust?*

Teacher 1: I think that is what I was thinking. We do what Ofsted tell us but they have a focus too just like (names maths consultant from previous comments).

Teacher 2: (inaudible) sometimes. They say different things. Ofsted (inaudible) and then someone else comes in

(Interrupted by)

Teacher 3: like school improvement or someone from the MAT team.

Teacher 2: They say different things. Then you don't know.

Teacher 6. But sometimes the targets are important. It's good to know if something isn't as it should be. If we are thinking about school improvement? That is how we know what to improve.

Teacher 2: Ofsted set the targets and we have to do them'

Teacher 6: But what I am saying is that we should.

Teacher 1: I agree. We should be told what to change and it can be a good thing – way to improve.

Teachers agree.

What about other stakeholders in school?

Teacher 1: Just thinking about the NQTs or ECTS.

Teacher 3: We don't have ECTS.

(Others agree or disagree)

Teacher 1: We do the paperwork. The NQT needs that completed to pass. So, we do that and then we talk about what is happening in class. What he really needs help with. The practical stuff. That can be the most effective way at improving what happens.

Teacher 2: That's the same as our appraisal. That is school improvement. Right? We all have appraisal targets. The targets are related to the school development plan. Whatever is on there. Then in appraisal we try to think of actions. So, ways we can chieve the target in class. Things we can actually do (laughs) not, not do'

Teacher 1: Sometimes things aren't doable. I mean. We only have certain time to do things and my appraisal doesn't show that. Not realistic.

Teacher 4: We just go away and think about the real way of doing things. In the classroom. We help each other. That can be the best way.

Teacher 3: Kind of interpreting (laugh) what they want.

Teacher 4: Yes. Finding a real way of doing it.

Teacher 6: That can be hard if they are your friend. Appraisal I mean.

Teacher 3: Yes, that happened to me. Not with appraisal but I mean when I got on well with someone and I had to help them improve. *It is awkward if you get on well with someone, like if it was your planning partner, and they need to change something, or they are not doing something they should. I've had something like that before. Luckily it was OK, and he understood but it could have made things tricky. I think that is because we are teachers and leaders. That is what the new Ofsted framework tells us though. We must know our subjects well.*

Teacher 4: It can be a positive if you know someone well. It can make things change quicker, get better and improve. Sometimes, I ca see what you are saying. It might be tricky.

Do you think this is another way that school improvement impacts on your colleagues? Can you collaborate?

Teacher 3: We all would love to do more (working with other schools) but we have marking, getting things ready for the next day, stuff like that.

Teacher 2: Also, time.

Teacher 1: Time (said together)

(All laugh).

Teacher 1: We don't get the time to do it but I think it can work.

In school improvement?

Teacher 1 and 2: Yes.

Teacher 4: Time to work together but also time to think about it afterwards. When was the last time we met with (names school).

Did you work with them a lot?

Teacher 4: Yes. Then nothing. That's a shame. I don't really know how things worked out for them. It took ages to get to know the staff, then to get to know the ones you worked with. Then we worked together, and it all stopped.

Teacher 3: We did a vocabulary project with another school (looking at other teachers to explain). It went really well but we never went back to see how it went for them. Is that what you mean?

Teacher 4: Yes. Not even to see the people we worked with. It could be important to learn from others. Imagine if they didn't do as well with it. We have done the oracy project and moved on with it but maybe it didn't happen there. I will have to ask (names colleague).

Teacher 6: I worked with a computing lead, and it went well. I learnt a lot as it wasn't really my area. I learnt what we should be doing. It helped me do my role and I think computing got better in the school. It certainly, er, raised the profile in school. That took a while to build up that relationship. Goes back to trust that we were talking about earlier.

2. Do you think school improvement follows a linear path?

(No comments so I describe linear)

Teacher 1: *One SIP might say one thing and then a year later someone says the opposite and we knew that all along. Is that what you mean.*

Teacher 4: Yes, that's what we were saying before. Sometimes people say different things and you don't know who to believe.

Teacher3: It is when they say the same things you need to listen.

(All laugh).

Do you think that the strategies always go in the direction that was intended or does anything else happen.

Teacher 3: Different directions. That's schools. Things happen and you don't know they will. Also, we can't control everything, like the children's lives at home. I think we would like to but…

Teacher 4: If that is what you mean then no, not linear? Things always change, all the time.

So, do you think that school improvement strategies do what they set out to do? Something more or less?

Teacher 4: Both. Sometimes more. You might improve the things or improve things in a different way than you planned. Some of the meetings I have with parents are for one thing but we sort lots of other things out. Sometimes not at all. They don't work. I can't think of an example.

Teacher 5: I can. We did a reading intervention, because of our end data. It was terrible. So boring, the children hated it. It didn't work and we stopped.

Teacher 4: Yes, we had a reading intervention like that!

Teacher 1: Sometimes it can be both. Like not what we intended but does something else. I remember things like that.

Do you think the focus of school improvement can sometimes mask the problems in society?

All: Yes!

Teacher 4: Like poverty. We must give the children breakfast and give them uniform.

Teacher 3: Our oracy project really is because children come to school because they can't speak. That's because of technology.

Teacher 4: And parents. They don't speak to the children.

Teacher 3: Also, we must sort all the problems like teaching the children how to be safe online. Really parents could do that. That's a society problem. Not that I think we shouldn't, but it does all fall at us.

Does this impact on school improvement?

Teacher3: Yes because we have to fit it all in. It all takes away from improving other things. The oracy one is on the school improvement plan and on the pupil premium plan. So that definitely does.

Teacher 2: We do the daily mile. That's because of obesity. That was in the school improvement plan for PE.

(Teachers agree).

Teacher 3: So yes, we do wort society's problems out! (laughs)

(All laugh).

Key themes:

I have found in my research that there are key themes in school improvement

Consider themes –hierarchy, I explain the theme.

Teacher 2: Headteachers, the deputy and senior leadership team can change things, so can everyone else but not as easily…or quickly'.

Teacher 1: You know how some people just get to decide (others in the focus group agree by nodding)? Well, sometimes we may see something important, and it won't be done or included in the plan.

Teacher 2: That's what I mean. We aren't always the people that decide. Like we said at the beginning.

Teacher 3: Also, deciding the money. What gets spent. We just mentioned PE. That is a good example of silly spending. There is always loads spent on PE…because of the grant (Primary Sports Grant). It's crazy! We need books, and trips and things that make school fun, but we don't have any money. How can we make learning better for them (children) if we can only spend money on footballs'.

Teacher 6: That isn't always the case though (as the primary sports grant). Pupil premium funding has helped us target money towards the important things.

Teacher 3: Yes, and now we can spend it on all the children. That is better. We just said about society problems well that is a good example. The extra we get for pupil premium. They are disadvantaged so we spend more on them.

Teacher 3: Yes, that and the funding we got for the reading books. We have to spend that on things and that has meant that it can be planned. Sometimes we can change the plan, so it is flexible but if not, we would be able to spend it on anything and not on the things that we know make a difference.

Teacher 2: We didn't get money for reading books which was ridiculous. We said we needed them and also things to make things exciting for the children. We have to spend our own money on that. We know, teachers, what makes it exciting. Like things the children can touch, experiments or trips. But there isn't always the money for that.

Teacher 3: With the oracy project there wasn't much money. I wanted to get some resources, but it took ages to get them to spend the money on it. They wanted it done but didn't back it up with what we know the children need.

Teacher 6: Sometimes that is good though because so much money gets wasted on silly thing. Things that won't last or are trendy. Like, I don't know, I've seen a lot come and go.

Key theme of experts explained.

Teacher 2: I think that when we get told to do something we all want to get it right. We want to change if we need to. If someone tells us to. We all want to get it right and I think most of us have a go and do our best. It's not always easy to do something different or learn something new, like a new computer programme or scheme of work, but we do. Sometimes the expectations are ridiculous. Like there isn't enough time in the day to do that or how can we do that with a room of five-year-olds all doing something else. Sometimes we get asked for a TA (teaching assistant) to complete something and we haven't even got one!'.

Teacher 3: I agree. We want to be good at our job. No one comes into teaching want to be bad. Sometimes it's just not practical to do what they ask but on the other hand we find ways and I guess this is the thing about school improvement. It forces you to do better even if you think you can't. But I agree, sometimes it is hard to find a practical way to do things.

Teacher1: (I feel the) same. At times it can get you down, changing things or starting new projects. Even just knowing that something isn't good enough, like the data or the children's books. But we just do it don't we. That's what teaching is. We don't say no because we want the best for them (children).

Teacher 3: The experts you describe do tell us what we need to change but it is better when they tell us how.

Teacher 2: Yes, but only if it is possible.

Teacher 3: Yes.

Teacher 6: I think you are both right as we need to change and be told how but it needs to be someone who knows schools and who has worked in schools recently. They need to know what they are talking about. Not just be a failed headteacher or something like that.

Teacher 4: I agree with that. There is nothing worse than when someone tells you to do something and you think, what do you know. That stops anyone from improving.

(All agree).

Teacher 3: But what if you don't agree but they are right?

Teacher 4: That's true I suppose. That is, er, challenging. Maybe when more than one person tells you then you think, oh I need to change.

(Long silence)

Teacher 3: I think it's important to talk to the children as part of the monitoring. Ofsted do this too. We try to do it at our school because sometimes the books don't show you everything. There isn't the time. Who will have my class when I do that? A supply teacher isn't the answer, but I don't know what is. I don't have an answer, but I know that to improve a school you need to talk to children.

Teacher 4: Yes.

Teacher 2: We have always done that.

Teacher 3: That's true but only if you know what you are doing. And there isn't always time.

Teacher1: There isn't, and this can stop me from improving my subject. I guess (leaders) must prioritise. That's what they are doing. There isn't enough time to do it all.

Teacher 4: But if here isn't enough time then it can't be that important to improve?

(Some agree and some don't say anything).

Described the theme training.

Teacher 4: Training can be good or … less useful. It depends on who does it.

Teacher 3: Well sometimes it's the person doing it, if they love what they are doing. Then it is contagious, you want to do whatever (they suggest). We has someone doing the phonics training and this went well. Now everyone does it.

Teacher 4: what do you mean?

Teacher 3: All children learning phonics in this way, in such a structured way, has been so good. The children are building on what they know, and we know what comes next. That is a good one, erm, school improvement, that we have done. We got that one right

Teacher 4: Yes, I see. We do. Or they do, not me. I'm in a different key stage. Except, do you remember ELS (English Literacy Support)? The training was awful, so was ELS. That didn't last long (in school). That was when I was in Key stage 1.

Teacher3: Well, I think it worked for a while but that was ages ago.

Teacher 6: I know, coming back from training and thinking about all that you need to do. All that you want to do. Then things get easier because you change your practise. So, something that took a long time before and you didn't get results, gets easier and the children improve. Behaviour strategies or help with our new (Main information) system.

Teacher 1: I agree but I think if we have given it the time, time to train or make new resources, we should think about whether it was good. Did it work? I know that is more time but maybe we just need to do less and take the time.

Teacher 3: Behaviour strategies?

Teacher 6: Yes, at my school we had training and I didn't think, I thought it was trendy. Then it did. It was a surprise.

Teacher 4: Like the trauma informed schools.

Teacher 1: We had training for the TAs to improve the early years. That worked well but we gave them loads of time to work together. Time to talk about it with me. I agree though, t as good that they did it together.

Described the key theme of clarity,

Teacher 5: Yes, clarity is important for everyone otherwise we don't know the point of something. That is like when we aren't expected to do something anymore, like assess in a certain way. It is good to know so we can stop doing i. Sometimes, I agree with the teachers, things can just fizzle out.

(All agree)

Teacher 2: It is hard to know what he Head wants if we aren't told. I agree with the teachers, it should not be a guessing game. That won't have a good outcome for anyone. Especially the pupils.

Teacher 3: And on us. Not a good outcome for us.

Teacher 6: So, what we are saying is that the clearer the explanation the more likely we are to doit and do it well. Also, the better it is for everyone and the school. But it has to be right. It has to be understood. There is no point improving something if it doesn't ned improving, and I think it would be good if they asked us sometimes as we do it every day.

Teacher 3: Yes, rather than just telling us. Asking sometimes too.

Teacher 2: I Covid we were told to do a lot, rather than asked. That made the work harder as often we found better ways to do it.

Teacher 3: Oh, I think they did ask us at our school. There was still more work though. It has got better now. Less than before.

With improvement?

Teacher 3: Yes, with school improvement. They were constantly wanting us to do things better online and we often explained how it was working better. School

improvement has gone back to normal now, for school improvement I mean. We can't get it right all the time – we work with children!

Teacher 1: ummm. *Things are so busy already and changing things doesn't help. There is a lot of chat about workload, but I don't know, it doesn't seem to make a difference.*

Teacher 2: Workload is always hard though. That is what teaching is. It is hard m especially if things keep changing. I agree though about Covid. That was really tiring.

Teacher 4: I know you said workload is hard but it's not as bad as it was. Covid…erm…school closing…or not closing, that really increased things. We had to get better at things we had never even done before. Teaching from home, parents, coming into school and trying to cope with the changes. It was worse then. Lots of the things we had planned, remember, we had all those plans after Christmas, we just forgot

Is there anything else you would like to discuss about school improvement or anything else you think is important?

Thank you for taking the time to speak to me today. Let me briefly summarise the notes I have taken from the focus group.