

**Self-Organised Learning Environments:
Appropriation in an English Secondary School Context**

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Abstract

Self-Organised Learning Environments (SOLEs) have captured the imagination of some educators who welcome the suggestion that children can learn without adult intervention. While this is an intriguing prospect, it undermines the role of the teacher and does not necessarily resonate with the experiences of educators in English secondary schools. SOLE grew out of research in India and was developed in English primary schools; to date there is no literature regarding the appropriation of SOLE in English secondary schools. Although this research centres around SOLE itself, it extends to a wider consideration of innovative practice in a context that is centrally controlled through a comprehensive system of accountability.

Activity Theory formed the theoretical framework for this research which was useful for explicating the complex school environment. The principle of contradictions was particularly suitable for understanding the challenges that teachers faced in SOLE implementation, which typically centred around the object. Two schools formed the cases in a comparative case study, where in depth consideration of each school facilitated understanding of local factors impacting on appropriation, while cross-case analysis provided insight into the wider cultural, historical and social influences.

The findings confirm that the wider context within which schools operate is influential and this research contributes an analysis of the significance of the distribution of power within activity systems. In addition, the findings suggest that SOLE use can be sustainable in English secondary schools, albeit with some redefinition of the notion of sustainability to reflect the restrictions imposed by the wider context. Finally, this research offers some insight into the challenges of implementing innovations which are underpinned by epistemological assumptions that differ from the dominant activity; this has been characterised as the 'epistemological fog'. Recommendations are made for practitioners who are interested in introducing SOLE, or similar innovations, to their own contexts.

Dedication

To Jonathan, who believed I could do this long before I believed it myself. Without you I would never have got to the end and it wouldn't have meant so much when I did.

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Chapter 1. Introduction

1.1 SOLE in Secondary Schools in England

Self-Organised Learning Environments (SOLEs) are based on the belief that students can learn without adult intervention. While this is an intriguing prospect, it does not necessarily resonate with the experiences of educators in secondary schools in England. Developed by Sugata Mitra, following a series of experiments in India known as the 'Hole in the Wall' (HiW) (Mitra, 2003; Mitra, 2005; Mitra, 2006; Mitra, 2014b; Mitra *et al.*, 2003; Mitra *et al.*, 2005; Mitra and Crawley, 2014; Mitra and Rana, 2001; Mitra and Dangwal, 2010; Dangwal *et al.*, 2005; Dangwal and Kapur, 2008; Dangwal and Kapur, 2009a; Dangwal and Kapur, 2009b), SOLE made its way into the mainstream following Mitra's TED Prize win in 2013 (TED: Ideas Worth Spreading, 2013). Mitra developed SOLE as a form of 'Minimally Invasive Education' (MIE) (Mitra and Rana, 2001; Mitra, 2003) which is designed to give students as much freedom to learn as is possible in a formal school context. A SOLE begins with a teacher posing a 'big question', one which ideally has no right answer. Students are then given time to collaboratively create an answer to that question using the Internet, before they are asked to share their findings as a group at the end (Mitra, 2014a). Other than perhaps the big question, this differs little from any other research task students might be asked to complete in schools and consequently some have questioned whether SOLE offers anything original (Clark, 2019). I would argue that there are two features which make it unusual. Firstly, during a SOLE there should be fewer computers than people to encourage collaboration, Mitra (2014a) recommends approximately one for every four students. While the benefits of the four to one ratio have been recognised through a focus on exploratory talk or collaborative work, the deliberate provision of fewer computers than students to promote such collaboration is uncommon. Secondly, students should be given freedom of movement, this includes allowing them to choose their own groups and to move around during the SOLE session, talking to other students and changing groups as they wish. Teachers themselves perceive that this particular combination of features is unique and it was clear during this research that they characterised SOLE as a distinct learning activity.

This research is focused on the use of SOLE in secondary schools in England. These are currently subject to centralised control in a system that prioritises high stakes test data as the best measure of what works. School leaders and teachers have largely lost control of the what, how and why of teaching and are expected to respond to a near continuous barrage of policy reforms intended to raise educational standards (Braun, Maguire and Ball, 2012). The current international discourse around education reinforces the notion that high stakes tests are both the best way to raise standards and to measure the extent to which things are improving (Lingard, Martino and Rezai-Rashti, 2013). Thus the very definition of what it means to be educated has come to be synonymous with high stakes test results. In addition, the marketisation of education, which is enforced through a “public technology of performance” (Ball *et al.*, 2012, p.514), has put pressure on schools to align themselves with the government perspective. Within this climate of ‘performativity’ (Ball, 2003, p.226) school leaders and teachers may be forgiven for taking measures to protect their position and it seems fair to conclude that it is not an optimal time for innovation.

1.2 A Personal Perspective

Prior to embarking upon this doctoral endeavour I was a secondary school teacher in England. I first heard about SOLE when Mitra was invited to speak at the school as part of the Continuing Professional Development (CPD) programme and I was intrigued by the possibility of using SOLE in a secondary school setting because it seemed to clash so completely with the priorities of that context as I understood them. At that time I was becoming increasingly frustrated with the changing landscape of secondary education. When I began teaching in 2005 I had been inculcated with the idea that students should be encouraged to actively construct their own learning and that opportunities for creativity were beneficial; I found the facilitation of such learning to be both enjoyable and rewarding. By 2013 it seemed that the impact of changing national policy was to restrict the opportunities to teach in that way by mandating that the curriculum become ever fuller and high stakes test results ever more sacred; accountability and performativity appeared to define my role (Alexander, 2008; Ozga, 2008; Ball, 2003; Ball *et al.*, 2012; Lingard, Martino and Rezai-Rashti, 2013). As I began to familiarise

myself with the latest set of changes dictated by the national government the thought of enacting them, as Curriculum Leader for History, filled me with dread. It was thus jarring that, at a time when I was becoming increasingly frustrated by a perceived decrease in autonomy, Mitra was advocating SOLE use. It greatly appealed, yet I struggled to conceive of how it might be done in a secondary school because everything about it seemed to create conflict with normative practice: open questions with students being free to explore learning in any direction did not work within a heavily prescribed curriculum, freedom of movement clashed with the requirement to measure the progress of individual students and use of the Internet did not ensure coverage of the highly specific exam syllabus. Intrigued by the possibility of SOLE but apprehensive by my perception of the challenges, I was fortunate enough to be based in the north east of England near the university where Mitra was based. After a seemingly casual conversation, which covered much of the frustration described above, he mentioned that research into SOLE was needed and offered me this PhD opportunity, partially funded by SOLE Central at Newcastle University. Keen for an opportunity to remove myself from the secondary school context I was so discouraged by, I accepted.

The 'Schools in the Cloud' that Mitra established with his TED Prize money were an obvious focus for my research because they represented existing locations where SOLE was likely to be happening. Five of these were located in India and initially I was enthusiastic about the prospect of travelling there to research, perhaps comparing SOLE in those locations with the two in the UK. However, in an effort to further develop my understanding of SOLE I conducted a research project in one of the UK 'Schools in the Cloud', the secondary school at which I had previously been employed, and I became fascinated by the way that both the teacher and the students responded to SOLE in this setting. The project lasted for eight weeks, during which time a class of Year 8 students were taken to the SOLE Room twice a week in place of their usual Geography lessons. They were given two big questions to answer on the topic of population and at the end of the eight weeks each group presented their answers. The findings of that project have been published (Rix and McElwee, 2016) so I will not repeat them in detail here, but I will note some pertinent observations. Firstly, it was clear that SOLE did

create conflict for both teacher and students and that they typically tried to resolve these by defaulting to the type of learning experience with which they were more familiar. Thus students did not fully embrace this freedom to learn in the way I had assumed they would. Secondly, it became evident that attempts to resolve these conflicts resulted in SOLE emerging in a slightly different form to that which Mitra described. Despite such challenges, I knew from speaking to ex-colleagues that many teachers valued SOLE use and were determined to persevere with it and I was intrigued by their commitment because it was clear that disregarding SOLE altogether would have been easier. This raised a number of interesting questions which I was keen to explore further. Thus, recognising that my real interest lay in the English secondary school context within which I had worked, rather than the more informal learning environments in India, I limited the scope of my research to the two schools in England that had created SOLE Rooms as part of Mitra's TED Prize project.

While there is some research into the appropriation and efficacy of SOLE in one English primary school (Leat *et al.*, 2011; Dolan *et al.*, 2013; Mitra and Crawley, 2014) there is no equivalent research about SOLE use in secondary schools, with the exception of the paper published following my pilot project, which was a very small scale study. Thus this research emerged from my own specific interest and expertise as a secondary school teacher, together with the fact that there was no existing literature exploring SOLE use in that context. Although the two schools that formed the basis of this research had designated SOLE Rooms, they nevertheless represented fairly average secondary school settings and hence it is intended that the findings from this research could be applied to other similar contexts.

1.3 Aim and Objectives

The way in which SOLE use might emerge in a secondary school environment has not been researched. This study aims to provide some empirical evidence regarding the appropriation of SOLE in secondary schools in England. The main question underpinning the research is as follows,

“How was SOLE appropriated in two English secondary school contexts and what factors impacted upon that appropriation?”

This question aims to explore the factors impacting upon SOLE appropriation, with particular reference to the wider national context that I personally had found so restrictive. I was interested to establish whether others shared that view and, if so, how far that prevented engagement with SOLE. Such findings will be useful for those interested in appropriating SOLE in their own contexts and will offer some insight into the implementation of innovations in secondary school contexts more generally.

Activity Theory (AT) is the theoretical framework that I used to help explain the research findings; the language of the activity system informed my subsidiary research questions as follows:

1. What was the object of the activity system during SOLE and what impact did this have on appropriation? What contradictions were apparent and (how) were they resolved?
2. What was the nature of the rules that were operative during SOLE and what impact did these have on appropriation? What contradictions were apparent and (how) were they resolved?
3. How did the division of labour manifest during SOLE and what impact did this have on appropriation? What contradictions were apparent and (how) were they resolved?

AT can be used to help conceptualise some of the challenges that teachers might face in terms of SOLE appropriation and I anticipate that understanding the schools as activity systems will engender a wider application of the findings.

It is intended that this research will offer evidence regarding the extent to which it is possible to implement innovative practice, such as SOLE, in English secondary schools at present. It will contribute to a greater understanding of any factors that might constrain such innovation and the use of AT will enable differentiation between local and national barriers, as well as consideration of any interaction between the two. This should support educators who wish to implement innovative strategies by helping them to recognise and impact upon the factors they can control, rather than spending time on those they cannot. The findings will also reinforce the importance of an analytical approach to school ecologies in the process of

innovation, whereby the context itself can be affected by that innovation and vice versa. This research is timely because SOLE use appears to have gained momentum in the time since Mitra's TED Prize win, with evidence that it is used in a variety of learning contexts, both formal and informal, around the world (Newcastle University, 2018; School in the Cloud, 2019).

1.4 Structure of the Thesis

The structure of this thesis is underpinned by the research question stated above. The Literature Review (Chapter 2) explores the themes introduced here, tracing the origins of SOLE from the HiW experiments and explaining how those findings shaped SOLE development. It will also consider the secondary school context in England, describing the prevailing national landscape and how that impacts upon classroom learning. The chapter will conclude with some consideration of what that context might mean for innovative practices such as SOLE. The theoretical framework, centred around Activity Theory, will be presented in Chapter 3. This will clarify how the theory has been understood and applied during this research and will justify its suitability. The Methodology (Chapter 4) will discuss the ontological and epistemological underpinnings of this study and show how they are consistent with the overall research design. Methodological decisions concerning data collection and analysis will be explained and justified, as will the measures taken to ensure that this study complies with ethical guidelines. It is in this chapter that the schools in which the research took place will first be introduced. The volume of the findings from this research were such that they have been spread across two chapters (Chapters 5 and 6). Chapter 5 will begin with an overview of the practicalities of introducing SOLE to each school, before describing the two schools in terms of activity systems, introducing the components that will form the basis of the remaining findings. The chapter will then address the first of the subsidiary research questions regarding the object of the activity system during SOLE. Empirical data will be provided as evidence of the findings, with each school being considered separately to ensure depth of understanding, before a brief comparative overview elucidates similarities and differences between the cases. Chapter 6 will provide data in answer to the second and third subsidiary research questions stated above, focusing on the rules and

the division of labour within the activity systems. Again, findings from each school will be detailed separately before concluding with a comparison of both cases in relation to each question. The Discussion (Chapter 7) will develop the issues raised in my findings in relation to the existing literature presented in Chapter 2. There are three themes that will be discussed in greater detail. Firstly, the concept of nested activity systems will be introduced followed by a discussion about the significance of the distribution of power within such a system. Secondly, consideration will be given to the possibility for sustaining innovative practice within the English secondary school context, with some suggestions both for how we should understand sustainability and for how innovations can be introduced to achieve some measure of it. Thirdly, there will be a discussion about how SOLE challenged the epistemological assumptions of teachers and the extent to which this hindered effective SOLE appropriation. The importance of engaging teachers in understanding epistemology, in order to support them in making appropriate pedagogical decisions, will be considered, before concluding with some implications for those looking to implement similar innovations. The final chapter of this thesis will comprise The Conclusion (Chapter 8), which will summarise the research and offer recommendations for both practice and future research.

Chapter 2. Literature Review

2.1 Introduction

In this section I will provide an overview of the existing literature that is pertinent to this study, in order to demonstrate its relevance. I will begin by critically analysing the evolution of SOLE from Mitra's early Hole in the Wall (HiW) experiments, demonstrating how the latter developed into the former. This will include discussion of some of the critiques of SOLE, together with an overview of the literature that has been published regarding SOLE use in formal school environments to date.

The focus will then move to a review of the English secondary school context. It will begin with a brief history of secondary schooling over the last century, before describing the current national context with consideration of how that impacts at a local level, including the prevailing approaches to learning. These approaches will be directly compared with SOLE to highlight the scale of the challenge of implementing it in such a context. A discussion of whether innovation is possible in such an environment will conclude with some consideration of how we might conceive of sustainability in English secondary schools at present.

2.2 The Origins of SOLE: The Hole in the Wall Experiments

As early as 1988, Mitra felt confident that children could learn skills in an accelerated manner when given unsupervised access to computers (Mitra and Rana, 2001). Over the next two decades he tested this early hypothesis, predominantly through the HiW experiments, from which the concept of SOLE evolved. Any attempt to understand how and why SOLE developed must therefore begin with a discussion of the HiW experiments.

2.2.1 Can Children Learn Without Adult Intervention?

One key finding which informed the development of SOLE is that children are able to teach themselves how to use computers without adult supervision, something which had started to become evident within hours of the first experiment beginning in January 1999. Intrigued to see what would happen if disadvantaged children who had never seen a computer were given unsupervised access to one, Mitra put a computer kiosk into a 'hole in a wall'

of the slum bordering his office compound in Kalkaji, New Delhi. The slum housed a large number of children, many of whom did not attend school and had little understanding of English (Mitra and Rana, 2001; Mitra, 2006). The computer was deliberately designed to be accessible to children, though no instructions were given about how it worked, and a video camera was placed nearby to unobtrusively record what happened. Within a few hours of the computer becoming available children had learned how to manipulate and click the mouse. Over the following days they began using the PC for browsing and drawing and developed a vocabulary to enable them to talk about the unfamiliar computer icons (Mitra and Rana, 2001). Although the findings from this first experiment were arguably compromised by a “situational intervention” in the form of a local resident who was computer literate and was observed showing some children how to work the touchpad (*ibid.*, p.228), nevertheless the extent to which the children were able to use the computer with such minimal guidance was considered worthy of further investigation and the experiments were repeated in two other locations, with very similar outcomes. Mitra began to draw some early conclusions regarding the learning process, in what he referred to as a ‘Minimally Invasive Environment’ (MIE) and these would inform his later development of SOLE (*ibid.*). He particularly emphasised the collaborative nature of the learning whereby children made discoveries and then showed each other what they had found, the exploration of which led to further accidental discoveries and a repeat of the cycle; the prioritising of collaboration is a key feature of SOLE. However, Mitra (*ibid.*) also recognised that at some point during the process the learning plateaued and no new accidental discoveries were made so children occupied themselves in practicing what they already knew. At this point he suggested that “intervention is required to introduce a new “seed” discovery” (*ibid.*, p.231), an observation which is pertinent to this discussion of SOLE implying, as it does, the need for some form of mediation in order to progress learning.

Building on the conclusion that children could learn to use computers by themselves, Mitra (2005) was keen to measure the extent of this so more ‘holes in the wall’ were established and by 2005, there were one hundred

kiosks across thirty-one urban and rural locations in India and in rural Cambodia, nine of which had Internet access.

A test was developed to ascertain computer literacy levels, the Graphical User Interface Icon Association Inventory (Mitra, 2003), which found that groups of unsupervised children could learn to use computers to levels that were comparable with students who had been taught the subject; this has since been replicated across a number of experiments (Mitra, 2003; Inamdar, 2004; Dangwal *et al.*, 2005; Mitra *et al.*, 2005; Mitra, 2005). Mitra would later use this conclusion to inform the basic premise of SOLE, namely that children can learn without adult intervention.

Although Mitra has chosen not to situate these findings within the wider literature, the conclusions drawn from HiW, and upon which SOLE are based, are not themselves new. As early as the 1920s Vygotsky (1978) had characterised learning as a social and interactive process and thus identified the requirement for a collective dimension to facilitate it. There is also historical support for the supposition that children learn most effectively when they are given the freedom to direct themselves: “the matter of freedom, to choose how to do this, or to choose not to do it, is all important.” (Holt, 1983, p.216). Such independence tends to be justified by the perception that, where children are free to learn the things that they are interested in and that are relevant to their lives, they will be more motivated (Dewey, 2013; Rodero and Temple, 1995) and thus will “go faster, cover more territory than we would ever think of trying to mark out for them, or make them cover.” (Holt, 1983, p.232). The notion of transferring such responsibility over to the child has been accompanied by a discussion of the consequent need to redefine the role of the teacher to reflect a clear move away from Freire’s (1972) ‘education as banking’ analogy, where the teacher is an authoritative person in possession of knowledge they intend to ‘deposit’, and towards a facilitator who enables rather than instructs and who inhabits a peripheral position focused on observation (Montessori, 2007; Rodero and Temple, 1995), one who is potentially ignorant of the subject matter to be learnt. Thus, the foundations upon which SOLE is based are not themselves new, rather it is the particular combination of ideas and the

specific way in which they are arranged in practice that has a claim to originality.

While the HiW experiments have usefully established that children can learn by themselves when given unsupervised access to a computer, they have been criticised because there is no opportunity to influence what they will learn. Once basic computer literacy has been achieved, and it is difficult to argue against the value of this in a computer – dominated world, free use of the computer kiosks has not automatically equated to a pursuit of ‘learning’ in the sense that an educator or a parent might use the term. Warschauer (2004, p.2), who visited some of the HiW sites, saw little evidence that learning of educational value was taking place, indeed he argued that it was, “in practice, minimally effective education.” He blamed this on intermittent Internet access, as well as the fact that there were no educational programmes on the computers and no special content in the regional language of Hindi, which resulted in the majority of time being spent using Paint programmes and playing games. Some local parents suggested that the time spent at the computers actually detracted from their children’s schoolwork. Similarly, Arora (2010, p.693) visited two non-operational HiW sites and was told by teachers at a local school that, while the kiosk was working most of the usage had been for games; even the students themselves were now either unaware of its existence or said that they had “just played around” with the computer. Identifying the learning outcomes which should be deemed of value in an informal learning space is problematic, as is the question of who should be responsible for making that decision. Yet surely restricting any definition to those learning outcomes which are valued within a school context is both unreasonably limiting and suggestive of a significant misunderstanding of the potential offered by such an open learning environment. Nevertheless, the HiW experiments are the basis upon which SOLE was developed for use in formal school settings, so it is certainly relevant that when children used computers without supervision the lure of playing games was strong and was likely to impact on how children chose to spend their time. It cannot then be assumed that learning will automatically and spontaneously happen in a manner that a teacher might consider acceptable.

2.2.2 How Does Self-Organised Learning Happen?

As the HiW experiments continued, Mitra and his colleagues noticed patterns in how the children behaved during the learning process which would come to influence the design of SOLE. A collective dimension to learning, termed 'social networking', was observed to be vital and referred to the way the children at the kiosks formed groups which both provided the impetus for learning and facilitated progress through continual interaction (Dangwal and Kapur, 2008; Dangwal and Kapur, 2009b). This group interaction followed the cycle identified by Mitra after the earliest HiW experiments: accidental discoveries that were shared and then built upon by other children. However also emerging as significant were the group dynamics, characterised as "fluid, flexible, open to outside influence" (Dangwal and Kapur, 2009b, p.294), because this resulted in children approaching others in order to learn something new and moving between groups according to what they wanted to know. Consequently, learning manifested as a collective process whereby all children learnt and benefitted from the group, but the group also benefitted from the contribution of each child (Dangwal and Kapur, 2008). It was also claimed that this open form of collaboration, while encouraging children to pool their collective resources, affected positive changes in children's behaviour when they came to understand that they would learn more if they shared and helped each other (Dangwal and Kapur, 2009a). This finding manifested in SOLE as a rule that students be allowed to choose their own groups and move around freely during the session, to enable a shared cognition to develop.

The wider possible ramifications of the absence of supervision are not fully addressed, despite the fact that any collaboration amongst children that is free of adult intervention is potentially open to abuse by dominant personalities. Mitra (2003) himself found that access to the computers was not necessarily equitable as boys dominated and girls typically had less access and DeBoer's (2009) observations of twelve HiW sites confirmed this. Not only did she find that there were more boys than girls using the computers at every site, but also that the discrepancy was usually statistically significant. She offered a range of reasons for this, including the social pressures that are put on girls as they get older and the domestic

responsibilities they are expected to assume. While the lack of physical access is not an issue in an English secondary school environment where a whole class is likely to be taken to participate in a SOLE, social pressures could certainly both disrupt learning and create problems for potentially vulnerable students. At the HiW sites children could remove themselves from such a situation if they wished, but students cannot do that in a traditional school environment and their usual recourse for resolving problems, telling the teacher, is effectively discouraged within a SOLE framework. It seems dubious to assert that a classroom environment where free movement is not only allowed but encouraged and teacher intervention is minimal will automatically equate to democratic behaviour. Indeed Arora (2010, p.699) uses evidence from research on school playgrounds, which are similarly 'free' spaces, to argue that, alongside collaboration, HiW – style learning is also likely to foster “competition and discrimination”. Mitra and Rana (2001, p.231) refute this suggestion, arguing that MIE leads to self-regulation because knowledge (of how to do something on the computer) becomes a commodity and children come to understand that “a child that knows will part with that knowledge in return for friendship and exchange”. However, this claim fundamentally rests on a child wanting the knowledge or information possessed by another, which may be true where the reward is proficiency on a piece of new technology, but is less likely when the aim is to answer a question posed by a teacher about a subject that may not interest the student. Here the motivation to find an answer is conceivably weakened, and as the knowledge itself is devalued, so the democratic nature of the process comes under threat. Hence equity cannot necessarily be presumed in such an open learning forum and this has implications for SOLE in a traditional school environment where a teacher is advised to completely stand back from the learning process.

2.2.3 Can Children Self-Organise to Learn Subject Content?

Demonstrating that children are able to learn without adult intervention is undoubtedly significant, however learning the practicalities of using a computer is different to learning the type of subject content that forms the basis of schooling. Further experiments were conducted within school environments which found that children could improve their English

pronunciation, when left with a computer containing speech to text programmes but no instructions on how to use them (Mitra *et al.*, 2003). Similarly, when the computers had educational software on them as well as Internet access, regular HiW users were able to significantly improve their marks in school Mathematics tests in comparison to other students, although there was no notable difference in English or Science (Inamdar and Kulkarni, 2007). It therefore seems fair to conclude that unsupervised access to computers can positively impact upon school learning where appropriate software is provided, although it is worth noting the difference between the provision of a small number of relevant resources and access to the vast amount of contradictory information available on the Internet.

In terms of the development of SOLE, perhaps the most significant experiment was one which Mitra designed to find the limits of what children could teach themselves, known as the Kalikuppam experiment (Mitra and Dangwal, 2010). A group of thirty-four Tamil speaking children aged ten to fourteen years, who were already familiar with the local HiW kiosk, were given access to English language materials on molecular biology on one of the computers and simply told, "There is some interesting new material on the computer, it is in English and it may be a bit hard to understand, but will you take a look at it?" (*ibid.*, p.678). After seventy-five days with the material, but with no adult intervention, the children were tested and gained marks that were comparable with a local school where children had been taught the subject. Mitra then asked a local, friendly but unknowledgeable, adult mediator to encourage the children to learn more and after another seventy-five days the children were tested again. At this time, they achieved scores that were comparable with children in a private school in New Delhi (*ibid.*, p.681). This is undoubtedly impressive and lends credence to the idea that children are capable of taking far greater responsibility for their own learning than the traditional school system in England typically allows. It was on the basis of this experiment and the accumulated findings preceding it that Mitra developed SOLE, the terminology was first introduced here, and began to conceive of how it might be used within a formal education system (*ibid.*).

However, there are a number of issues to be considered both in terms of what the Kalikuppam experiment proves about learning without supervision and how those findings have been translated into SOLE. While the children in Kalikuppam achieved impressive scores on the tests in comparison to students at the private school, Arora (Mitra and Arora, 2010) noted that they had a total of 150 days to engage with the material whereas the length of time that the school students spent on the topic is not mentioned; it is possible that, with instruction, the private school children actually achieved the same marks within a much shorter amount of learning time, a vital consideration for secondary school teachers in England. She also emphasised the intensive nature of instruction in such schools and cautioned that we should not ignore the significance of “what else and how much else was learnt by both sets of children within that same timeframe.” (*ibid.*, p.2). The wider learning of each group of children should therefore be considered in order for a meaningful comparison to be made. The test itself may also have biased the results in that it was devised by two biotechnologists who were first asked to identify the learning resources that would be made available to the children of Kalikuppam and then to devise two tests based on those same resources. It does not seem controversial to suggest that the knowledge chosen for study by a subject specialist might not fully coincide with the topics that appear on a national or school curriculum. Presumably the children in the private school learned the subject using resources that were compatible with their own assessments, thus it is conceivable that the scope and range of the material covered by the two groups would have been different and the Kalikuppam children were arguably learning ‘to the test’. Thus, the comparison between the learning is not truly like for like and it would have been interesting to ask both groups of children to also take an assessment designed by the private school so that those results could also be compared. In addition, all the test marks that are given as evidence for learning are averages of what the children in each group achieved and while these figures are impressive, the information they provide is limited. If everyone in the Kalikuppam group achieved the same marks plus or minus ten, this tells us that achievement was fairly uniform and the self-organised learning method worked well for most or all children, however if most of the

children achieved either particularly high or particularly low marks, averaging out to the result provided, that has very different implications for a secondary school teacher in England who is required to ensure that most, if not all, students make good progress. Indeed, Mitra (Mitra and Dangwal, 2010, p.685) himself concedes that this approach will not work for everyone as “Not everybody learns something about everything. Some individuals may benefit; others may not.” This should not detract from what the children of Kalikuppam accomplished, but the range of marks does have implications for teachers in a different context, who are held accountable for the achievement of every student.

Concerns about the research findings aside, the fact that anything was learned by Tamil speaking children using only English language resources on a topic such as molecular biology is remarkable. Reflective educational practitioners are likely to agree that it necessitates some reconsideration of what might be deemed best classroom practice. SOLE is the solution advocated by Mitra, however there is a significant difference between SOLE and the process of learning that occurred in the Kalikuppam context. This experiment did not involve a ‘big question’ and it did not require the children to find their answers on the Internet, as SOLE does (Mitra, 2014a); the provision of just three resources bounded the scope of the learning and effectively prescribed the ‘what’ of the task. In a SOLE, students have access to the Internet and are expected to have the metacognitive ability to identify the relevant information themselves which requires searching for evidence, deciding whether it is both useful and valid and synthesising it into an answer. Where this is based on knowledge that is new to them it is very difficult for students to get any sense of what there is to be known, which information is more important than the rest or how much is enough (Paradowski, 2015; Sowe, 2013); the Internet is a vast and indiscriminate resource. Thus, the metacognitive load is very heavy, in terms of task structure, even before students begin to consider the content of their answer. Of course this was also true for the Kalikuppam children initially because the resources were in a language that they did not understand, however once they had found a solution to the translation issue, and how they managed this is not discussed, the task was not comparable to that of a SOLE in which so

many other cognitive functions are required throughout. This raises some questions about how far the achievements of the children in Kalikuppam can provide a basis for asserting that SOLE will be an effective learning strategy.

2.2.4 Using the Hole in the Wall Findings to Develop SOLE

The HiW, and other similar experiments, proffered three significant conclusions:

- children can learn when left unsupervised with access to a computer;
- they can learn school subject content in this way when given access to appropriate materials; and
- this learning is possible because it is collaborative in a manner that enables the development of a shared cognition.

These findings are the foundation of Mitra's SOLE. SOLEs "are created when educators encourage students to work as a community to answer their own vibrant questions using the Internet." (Mitra, 2014a, p.7) according to the 'toolkit' created to advise educators on how to implement it. There are two sets of instructions for teachers regarding how to manage a SOLE.

The first are the five SOLE rules (*ibid.*, p.7):

- 1) Pose a big question;
- 2) Students should choose their own groups but can join other groups at any time during the session;
- 3) Students can move around during the session to speak to whoever they wish and "share ideas";
- 4) Students can explore whatever information they choose;
- 5) Students should share their findings at the end of the SOLE.

Figure 2.1 shows how these are presented in the SOLE Toolkit. This forms the basis of teacher understanding of what students should do during a SOLE.

The second piece of

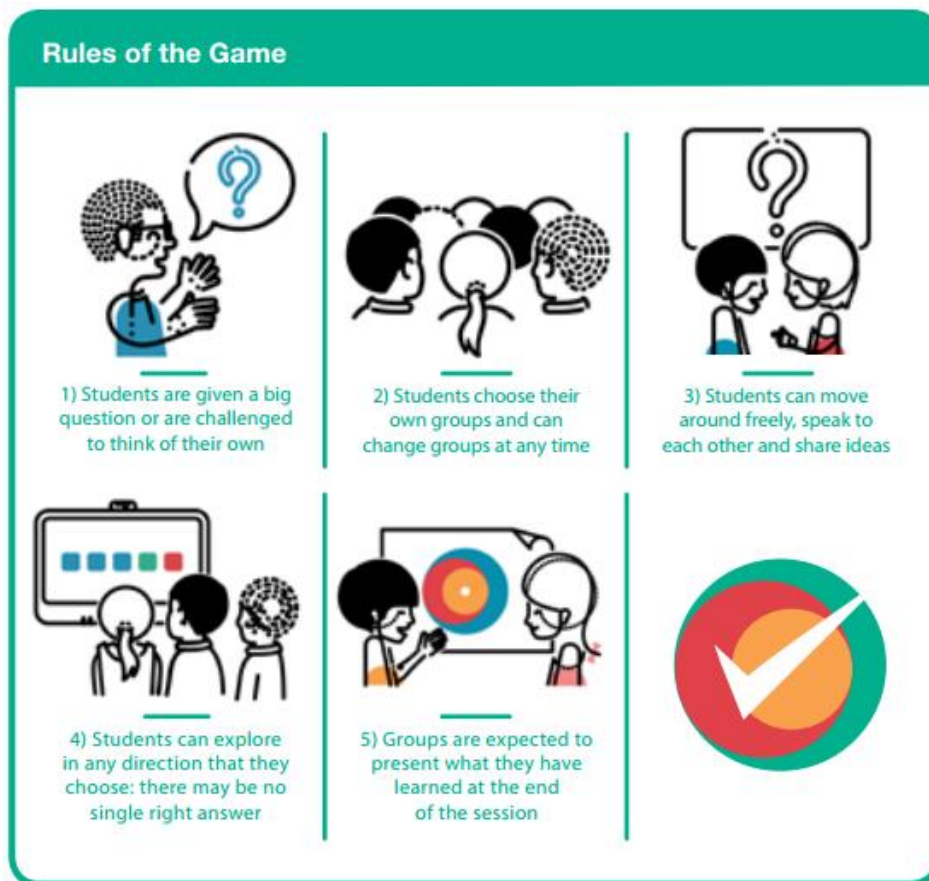


Figure 2.1 Guidance given to teachers regarding the rules of SOLE

(Mitra, 2014a, p.7)

guidance relates to timings for the SOLE, with five minutes given to pose the question, up to forty-five minutes for students to explore the Internet to find an answer and ten to twenty minutes at the end of the SOLE for a review of learning, where students share their findings (*ibid.*, p.15). This describes a SOLE as Mitra anticipated it might be used in a formal school setting, such as an English secondary school.

The SOLE guidance articulated here can be traced directly back to the three findings given above. Students are given a question to direct them towards learning, just as in Kalikuppam they were asked to look at some difficult material. They are allowed to choose their own groups and move around freely which aims to replicate the fluid and flexible learning process of the ‘social network’ effect observed consistently at HiW sites. This serves to redistribute the power that you would expect to see in a typical secondary school classroom, away from the teacher and towards the students. The freedom to explore without adult intervention, just using the Internet,

reflects the conclusion that children do not need supervision or guidance to learn what they want to learn, so long as they have access to information. The debrief at the end of the session is arguably the one concession to SOLE being used within a more formal school environment, where educators require reassurance that progress has been made.

2.2.5 SOLE: Evidence Thus Far

Very little has been written about SOLE in practice as it is still a relatively new phenomenon, but the premise on which the concept is based has been questioned (Paradowski, 2015)¹. The perception that a teacher or facilitator should avoid direct intervention during SOLE causes concern on the basis that asking a question, and then stepping back to enable students to take responsibility, means no one is available to scaffold learning or to prioritise and structure what there is to know. Some critics argue that, at best, SOLE is likely to result in a piecemeal approach consisting of nothing more than “fragmentary pieces of scattered knowledge.” (*ibid.*, p.45). Others suggest that the absence of a teacher to guide learning can result in students drawing “highly credulous conclusions” which no other student is able or willing to correct (Sowey, 2013). The involvement of a knowledgeable facilitator to correct misconceptions might therefore be considered vital and, although this can be achieved during the debrief of a SOLE session, such an approach has the potential for much ‘wasted’ learning time from the perspective of an educator in a school context. An additional concern is the assumption that the Internet is the only necessary learning resource, without any provision made for helping students to develop the skills they might need in order to navigate it effectively, such as assessing the credibility of sources (*ibid.*). Giving students a big question and then leaving them with the Internet necessitates the use of a wide range of cognitive skills that most have not developed

¹ Much of the current critique of SOLE exists in the form of social media, some of which is cited here. Good representative examples of blogs are: Clark (2015) ‘Mitra’s SOLE – 10 reasons on why it is ‘not even wrong’. *Donald Clark Plan B*, 29 October 2015. Available at: <http://donaldclarkplanb.blogspot.co.uk/2015/10/mitras-sole-10-reasons-on-why-it-is-not.html> and Harmer (2014) ‘Angel or Devil? The strange case of Sugata Mitra’. *Jeremy Harmer*, 7 April 2014. Available at: <https://jeremyharmer.wordpress.com/2014/04/07/angel-or-devil-the-strange-case-of-sugata-mitra/>

during their schooling and thus they are not equipped to learn effectively in this way as they lack the critical thinking skills that such an endeavour requires (Paradowski, 2015). Finally, and particularly relevant to the progress-driven context of English secondary schools, there is a suggestion that the freedom of exploration and lack of teacher guidance equates to a prioritisation of the process of SOLE learning over the outcome, specifically in terms of what is actually learned, and the consequent perception that both the quality of the answers found and the range of content covered are irrelevant (Paradowski, 2015; Sowe, 2013). SOLE remains a little-researched innovation so all conclusions at this stage are tentative and empirical evidence is required to either confirm or refute such critical comment. However, it is fair to say that, whatever the value of SOLE as a learning method in traditional school settings, it represents a significant departure from the dominant activities that teachers and students are likely to be accustomed to.

Despite the range of this critique, and it should be noted that none of those cited here appear to have tried SOLE themselves, small scale preliminary findings suggest that it has the potential to be effective within the English school system. As previously noted, little has been published on the subject and almost all research currently available is based on an experiment with one teacher in one primary school in the north east of England, which makes any conclusions tentative at best. However, a Year 4 class (eight to nine year olds) were given five questions from GCSE papers (national exams usually taken by sixteen year olds) and asked to answer them in a SOLE session. Their collective answers were marked and the average score awarded was 76.8%. When they were given the same questions to answer three months later, this time in exam conditions, therefore individually and in silence, the average score rose to 80% (Mitra and Crawley, 2014). The second set of results are particularly interesting considering that no further work was done on the topic in class during the intervening three months and the students were not told in advance that they would be tested a second time. When Mitra spoke to the children they explained that they had conducted further research in their own time or asked their parents because they were interested in the topic; this unanticipated improvement in understanding

over time was termed 'anomalous expansion of understanding' by the researchers (*ibid.*, p.84). Mitra and Crawley (*ibid.*) repeated the experiments with questions from the GCSE subjects of Physics and Biology, then with A level (national exams usually taken by eighteen year olds) questions on molecular structures, radiation and Geography topics and, although the overall average scores varied between 13% and 80%, nevertheless the students were evidently able to access information that was widely considered to be far above their current level of schooling. Furthermore, tests comparing individual and group reading comprehension found that levels increased when students worked collaboratively and that the improvement was more significant for the more difficult text, aimed at students two years older, than for the age-appropriate text (*ibid.*). In conjunction with the positive impact that SOLE appears to have had on learning outcomes, the students involved also tended to be very positive about the process, using fewer negative words to describe SOLE in comparison to other forms of learning, and over time they even began to request SOLE opportunities during other lessons (Leat *et al.*, 2011). Interestingly, the teacher recognised that her approach to learning changed over time, not just in SOLE but also during other lessons, as she gained a greater appreciation of what the students were capable of and became more confident about giving them responsibility for their learning. Her diary entries from the study reflected this as they demonstrated a changing emphasis over time, away from behaviour and towards learning (Leat *et al.*, 2011; Dolan *et al.*, 2013). The challenges that the teacher faced were clearly documented through her reflective diary entries, particularly with reference to the relinquishing of control, yet Dolan *et al.* (2013) noted that she came to view SOLE both as a transformative pedagogy and as one which supported her wider curriculum demands. This insight has wider implications for how SOLE might be made sustainable within a secondary school context.

Another piece of research shares some early conclusions from the introduction of SOLE in a Further Education context. It was found that students who had learned in this way generally scored as well, if not better, on assessments than those taught the same subject in a traditional manner and teacher feedback supported the contention that learning appeared

deeper and understanding greater, with students apparently energised by the use of SOLE (Ellis, Dyer and Thompson, 2014). There are also two schools in Australia, equivalent to primary schools in England, that have introduced SOLE across a range of age groups (Kenna and Millott, 2017). The literature about their experiences tends to focus more on how they made it sustainable within their context, rather than on providing evidence of the efficacy of the approach, but the educators concerned are certainly convinced of its value,

“Many students were reading and understanding more complex text than we would have imagined. Students who found reading challenging were able to access the information through their involvement in more discussions and conversations. We were observing that students were uncovering and accessing information that the teacher would not typically teach or cover in a traditional lesson. Discussions and conversations increased and students soon began creating their own questions to explore, not just relying on the teacher’s initial provocation. The more sessions of SOLE we taught, the more encouraging were the results, with very positive feedback from students.” (*ibid.*, p.109)

The existing literature therefore suggests some reasons to be tentatively optimistic about SOLE use in more formal school environments. However, all research thus far has focused either on vocational Further Education where students might be assumed to have a more clearly defined motivation for learning, or on primary schools, where the cross-subject nature of SOLE more naturally fits. There are a number of practical reasons why SOLE use in secondary schools is more problematic than in primary schools, Appendix A describes these in detail. The literature has also tended to consider the impact on student outcomes rather than the ways in which teachers make sense of the process. To date, the only published research about SOLE in an English secondary school is the paper that was written following the pilot project I undertook with a teacher from one of the schools involved in this research (Rix and McElwee, 2016). It was based on one small group of students using SOLE over an eight week time period and, while we found that students were able to learn content in this way, which was further developed with the introduction of peer-mediators, it is evident that conclusions from such a small project should be made with care. Therefore, this research is significant in beginning to fill the gaps in the existing literature around SOLE

use in secondary schools and to enable teachers and school leaders to make informed decisions regarding SOLE use.

It is worth noting that, although this research focuses specifically on SOLE, it is intended that the findings will have a wider application for practitioners who are interested in implementing a range of innovative strategies in schools. However, I have not included a review of the literature pertaining to alternative strategies because it would have been difficult to identify a set of criteria for other innovations from which comparisons might be drawn. For example such criteria could have included strategies that required Internet use, or those which redistributed control from teachers to students or those which adjusted the learning focus from what is learned to the process that students go through. The literature regarding such innovations could have relevance to the findings presented here, but to include them all would have been both unwieldy and would have heavily diluted the focus on SOLE; I was unsure where comparisons with other innovations might usefully begin and end. As a result, the focus in this literature review has been on SOLE, a very particular innovation with a distinct set of characteristics which became central to my findings. It is hoped that a thorough description of the features of SOLE and the ways in which they affected appropriation will enable practitioners to judge for themselves the extent to which they are similar to other innovations. In addition, the AT framework that was used to analyse the findings should provide a theoretical basis for generalisation whereby researchers can consider elements of SOLE, such as the division of labour or the object, and identify the way in which they are relevant to other innovations. Similarly, my findings are particular to the English secondary schools in which SOLE was appropriated during this research so the discussion below focuses on that particular context. However, I have drawn on literature from other countries with similar education systems, such as the USA, so it is hoped that practitioners in other contexts will be able to judge the extent to which they are similar to English secondary schools in order to make informed decisions about the applicability of these findings.

2.3 The English Secondary School Context

This section will focus on the context within which SOLE was implemented in this study, specifically the English education system at secondary school level. Although this research was limited to that context, the following discussion will consider the features of that system in detail which should enable educators from other countries to draw conclusions regarding the similarities to, or differences from, their own settings. The intention of this section is to explore the ways in which the secondary school context may support or hinder SOLE appropriation.

2.3.1 *The Last Century: Change or Stability?*

It has been compulsory for children to attend school in England since the Elementary Education Act of 1880 which mandated education for all children up to the age of 10. Shortly after, there evolved what Hargreaves (2000, p.154 emphasis in original) described as “a factory-like system of mass education ... where students were processed in large batches and segregated into age-graded cohorts or *classes*.” This description of school would be familiar to any teacher or student in England today, despite Priestley *et al* (2012, p.192) assertion that, “Decades of educational policy have sought to impose change” or Levin’s (1998, p.138) claim that the final two decades of the 21st century saw educational reform spreading like a “policy epidemic.” This paradox, described by Cuban (1990, p.71) as “long-term stability amid constant change”, is embodied within a school system which has been subject to ongoing centrally driven reform for approximately half a century (Fullan, 2016), yet which remains unchanged in most fundamental aspects. As Hargreaves (2000) noted, key features of the structure of secondary schooling have remained intact, such as fixed time periods, single teacher classes and subject separation, for over a hundred years.

Cuban (1990) argued that this failure to impact on the fundamental nature of the system was a direct consequence of the types of reforms that had been attempted. He categorised the vast majority as first order changes, which were essentially forms of quality control aimed at improving what happened within the existing structures of schooling. These did not attempt to fundamentally alter the system, indeed they served to reinforce it, and thus

had limited scope. Alternatively, second order changes should alter the “fundamental ways in which organizations are put together” by rethinking the very structures which maintain the system such as where authority resides or the organisation of time. Cuban (*ibid.*, p.74) concluded that since the early twentieth century most attempts to change the education system had been first order changes and as a consequence the dominant structures established approximately one hundred years ago became the “institutional benchmarks of what constitutes proper schooling.” Although Cuban particularly referenced the American system the situation he described was familiar in England too, for example the 1904 Secondary Regulations established the basis for academic subject-based courses which are studied by eleven to eighteen year olds to this day (Hargreaves, 2000). Tyack and Tobin (1994, p.454) referred to this as the grammar of schooling, arguing that just as “grammar organizes meaning in language”, so the grammar of schooling determines how we educate and this “has become so well established that it is typically taken for granted as just the way schools are.” Perhaps because of the pervasiveness of this framework, first order changes have tended to prevail, thus many aspects of the school system remain fundamentally unchanged.

A useful way to understand the prevailing secondary school context is Bernstein’s (1975, p.85) theory of educational transmission in which he suggested that “Curriculum defines what counts as valid knowledge, pedagogy defines what counts as a valid transmission of knowledge, and evaluation defines what counts as a valid realization of this knowledge on the part of the taught.” The curriculum is defined as units of time, each with its own content, so that the curriculum itself is the principle by which the units and the content are related to each other. They are not all equal, some subjects have more allocated units than others and some are compulsory while others are optional, all of which affects their relative status as evidenced by the privileged position given to Maths and English in secondary schools due to their double weighting in the Progress 8 performance measure (Department of Education, 2016). Bernstein (1975, p.80) identified two types of curriculum, the first was a collection curriculum in which contents were well insulated from each other, or strongly classified, where

students were expected to “collect a group of especially favoured contents in order to satisfy some external criteria;”. In such a curriculum the syllabus would be created by those who evaluated it and as students got older, they would specialise, effectively reducing the range of content studied. It would be transmitted via a visible pedagogy where framing was strong; the teacher would be in control of the selection, organisation and timing of a lesson and students would be relatively powerless (*ibid.*). This typifies the curricula found in secondary schools today and reinforced by the inspection body responsible for English education: The Office for Standards in Education Children’s Services and Skills (Ofsted). The second type of curriculum was defined as integrated, meaning that contents existed in open relation to each other and were “subordinate to some idea which reduces their isolation from each other.” (Bernstein, 1975, p.80). This second type of curriculum could vary in strength up to a totally integrated curriculum which would lack any of the structure found in schools today, for example no fixed time periods for different content, and it would correspond with an invisible pedagogy where students had more control over their learning. This kind of approach is far less common in English secondary schools at present.

This all has significant implications for SOLE which is usually perceived as a first order change according to Cuban’s (1990) typology because it can be incorporated into the existing structure of schooling as an alternative teaching strategy. Yet arguably, this type of change is insufficient. SOLE could be interpreted as a shift away from Bernstein’s (1975) collection curriculum towards an integrated one because ideally it allows for a shift in authority from teacher to student. Ideally, as students took responsibility for organising themselves, the ownership conferred would give them a significant amount of control over what they might learn (curriculum), how they might learn it (pedagogy) and how they might choose to present it to the rest of the class (evaluation). Herein lies a significant challenge for the appropriation of SOLE by secondary schools because if students were to fully self-organise it would require a second order change to an integrated curriculum, necessitating that the choices students made regarding the what and how of learning were authentic as opposed to teacher-directed, for example they might be able to adapt the length of a session according to

interest, cross, or ignore, subject boundaries wherever it seemed appropriate and work with any students in the school, rather than the few students who happened to be in their class. However, the nature of the secondary school system, where there is no flexibility in structure, essentially forces teachers to conceive of SOLE as a first order change that can fit within a collection curriculum. This has the effect of making it more likely to be used whilst simultaneously limiting its scope from the outset.

2.3.2 From Attempts at Reform to Centralisation and Accountability

Despite little evidence of fundamental reform in the structures of schooling, there have nevertheless been numerous first order changes which have transformed the context within which schools operate and have had a major impact on both schools and teachers. Significant attempts to reform began in the late 1950s and 60s when government led large-scale efforts by flooding the system with new ideas hoping that they would catch on; Fullan (2016, p.5) describes this as the “adoption era”. In the 1980s the focus of reform shifted to making schools and teachers accountable, and throughout the 1990s there was ever more intensified mandated reform (*ibid.*), perhaps the defining characteristic of which was increased centralisation, accelerated by the Labour government from 1997. Prior to the General Election that year both the main political parties in the UK made education a key issue with the Labour Party Leader, Tony Blair, stating at the 1996 Labour Party Conference “Ask me my three main priorities for government, and I tell you: education, education, education.” (BBC, 2007). Once Labour won a landslide victory, they used England’s poor performance across international studies of achievement to legitimise their actions for improvement (Ozga, 2008), such as implementation of the National Literacy and Numeracy Strategies for primary schools. For the first time central government took control not only of the ‘what’ of teaching, which had begun when the Conservatives introduced the National Curriculum in 1988, but also of the ‘how’, amid much scapegoating of teachers for poor performance (Alexander, 2008). Given that external exam boards also create the system of evaluation by which students are measured in high stakes tests, it becomes clear that teachers have lost much of the autonomy to decide “what counts as valid knowledge”, “valid transmission” or “valid realization” of knowledge (Bernstein, 1975, p.85).

These decisions are now largely taken at government level and imposed on schools and teachers.

This tendency towards centralisation, prescription and control remains in evidence today. Indeed, the idea of freedom in education, such as students pursuing their own interests and learning non-prescribed content, has become so improbable that the concept of a daily hour of free learning for students formed the basis of the Times Educational Supplement's April Fool joke in 2016 (Fradosia, 2016). An indication of how such continuous top-down reform might manifest in schools is offered by Braun, Maguire and Ball (2012), who identified 177 policies being enacted simultaneously across four case study schools; not all policies were fully enacted at all times, rather they were prioritised according to their impact on performance measures. Clearly this level of government-initiated intervention impacts both on what schools are doing and on the climate within which teachers work.

One of the most significant consequences of centralisation has been the accompanying increase in accountability based predominantly on high stakes testing which has become, "a metapolicy, steering educational systems in particular directions with great effects in schools and on teacher practices, on curricula, as well as upon student learning and experiences of school." (Lingard, Martino and Rezai-Rashti, 2013, p.540). This focus on assessment is driven in part by what Lingard, Martino and Rezai-Rashti (*ibid.*, p.540) refer to as "a globalisation of educational standards." International discourse suggests that high stakes testing is the way to drive up standards and the Programme for International Student Assessment (PISA) epitomises this in a system defined by, "Comparative performance measures ... constructed as central to a vertical, one-way, top-down, one-dimensional form of accountability" (Lingard, Martino and Rezai-Rashti, 2013, p.544). The international context filters down to the national system as governments compete to perform well in the PISA tests and this results in greater accountability of schools and teachers which manifests as a "public technology of performance" comprising league tables and Ofsted reports (Ball *et al.*, 2012, p.514). This leaves schools with little choice but to submit to what Loveday (2008, quoted in Ball *et al.*, 2012, p.514) describes as the

“tyranny of conformity” or to be publicly shamed for poor performance. Following the marketisation of education, which began in 1988 when schools became funded according to student numbers which depended on parental choice, the public scrutiny of schools is significant (Solomon and Lewin, 2016). It effectively creates local hierarchies with “winners and losers” (Greany and Higham, 2018, p. 14) whereby those schools deemed most effective according to performativity measures benefit from greater resources and opportunities, while those considered less effective face challenges such as undersubscription. Greany & Higham (*ibid.*) found that 85% of secondary headteachers who participated in their research agreed that there was a clear hierarchy of schools in their local area. In such a context schools inevitably feel the need to chase results and as a consequence lessons become focused on passing exams, particularly cramming information, as opposed to learning or understanding (Ball *et al.*, 2012). Indeed Mansell (2007, cited in Alexander, 2008, p.27) suggests that in this climate of “hyper-accountability” results have become an end in and of themselves which “does not guarantee better-educated pupils, just better statistics for schools and governments.” All of which is particularly concerning given that there no longer seems to be a national discourse regarding the purpose of education, rather there is an assumed link at government level between the education of individuals and national economic performance or, as Alexander (2008, p.9) argues, governments have now submitted to the “urge to claim causal links between pedagogy, educational attainment and economic performance”. Thus, the sole purpose of education appears to be the production of “economically useful citizens,” (Ball *et al.*, 2012, p.530), as judged by high stakes test results. In such a context assessment is dominant as the means by which governments can measure the success of a teacher and of a school and thus data is the lifeblood of the system, “shaping and building relations and knowledge and driving policy.” (Ozga 2008, p.263). Yet as Alexander (2008, p.22) explains, much of what is used to provide evidence of a teacher’s success or failure is included for no apparent reason other than the fact that it is measurable, “Thus, what happens to be within the bounds of statistical computation comes to define the very nature of teaching itself.” This notion can be extended to the high

stakes tests that students themselves sit, whereby numbers come to define a student's worth (Ball, 2015), because it is easier to measure what a student is capable of as an individual in terms of memorised information, than it is to negotiate evaluation of the learning achieved by a student within a group.

The impact on both schools and teachers working within this context is evident. Berliner (2011) identified curriculum narrowing as a rational yet "pernicious" response to high stakes testing whereby teachers and schools prioritised their time according to what was likely to be on the test. At best this might result in a data-driven pedagogy as the teacher focuses almost exclusively on the content and skills required to fulfil specific testing regimes (Roberts-Holmes, 2015), with little attempt to either ensure student understanding or to provide them with a grasp of the wider issues and themes. At worst there is evidence of erosion of the curriculum where time for non-core subjects is reduced, to focus instead on those which feature more prominently in league table data (*ibid.*). As Berliner (2011, p.291) notes, "Under pressures from high-stakes testing, educators make decisions that reflect compromised ethics, if not a complete loss of their humanity." The pressure on teachers should not be underestimated in this climate of 'performativity' which impacts on schools and teachers so completely that it doesn't merely get "in the way of 'real' academic work or 'proper' learning, it is a vehicle for changing what academic work and learning are!" (Ball, 2003, p.226). When significant portions of time are spent recording tasks, collecting data and creating monitoring systems a "values schizophrenia" results whereby teachers become torn between their own judgements regarding good practice or students' needs and the requirements of performance (*ibid.*, p.221). Even where teachers might resist the pressure to conform to such rigid state-mandated performance criteria, and this is possible, particularly within schools which hold a privileged position in their local area (Braun, Maguire and Ball, 2012; Greany and Higham, 2018), such resistance can be futile in the long term. Boaler (2002) documented an effective innovation where Maths was taught based on open-ended, real world activities and where GCSE results improved as a consequence, yet the headteacher insisted teachers revert back to a more didactic, text book-based approach under pressure to further improve GCSE results in readiness for an Ofsted

inspection. More recently, Solomon and Lewin (2016) found a similar trajectory in a school that had developed a personalised learning approach within a thematic curriculum, yet abandoned it to return to more traditional teaching and learning due to the pressures of accountability. It is somewhat ironic that in an education system where schools and teachers apparently have such little control, a national narrative nevertheless perpetuates the idea that they are solely responsible for student performance as measured by high-stakes tests (Lingard, Martino and Rezai-Rashti, 2013).

This wider context within which English secondary schools operate has significant consequences for the implementation of SOLE. Clearly the open approach to learning advocated by SOLE, with students free to explore ideas, concepts and content that interest them, does not comfortably fit with curriculum narrowing (Berliner, 2011) or prescribed content for high stakes tests. Where teachers are under such pressure from performativity (Ball, 2003), they will of necessity focus their time on topics that are likely to feature on those tests leaving little opportunity for the type of exploration that SOLE encourages. Indeed, this may be viewed by teachers, with the best of intentions, as being counter-productive according to performance criteria. Similarly, where teachers are put under immense pressure by the administrative requirements of a bureaucracy which requires they provide a written record to prove they have conformed, there is little time for teachers to invest in the implementation of new innovations, particularly those which are not valued within the wider system and thus will not contribute to the quality of their 'performance' as captured by accountability measures (*ibid.*).

2.3.3 Approaches to Learning in the English Secondary School Context

Having considered the wider impact, the national education system has on English secondary schools, we turn now to the corresponding impact in the classroom in terms of learning. By exploring the approaches to pedagogy that typically prevail it will be possible to articulate the extent to which SOLE might complement or disrupt existing practice. The dominant structures of secondary schooling, embodied by a visible pedagogy and collection curriculum (Bernstein, 1975), reinforce a fairly traditional form of teaching and learning based predominantly around maintaining order and teaching as

transmission. Many of the strategies used, such as students raising their hands and awaiting teacher permission to speak, date back to early last century (Hargreaves, 2000). According to Cuban's (1993) continuum of teacher to student centred instruction, many students currently at secondary school in England would be familiar with the observable measures of a teacher-centred approach that were ubiquitous throughout the last century, including the teacher talking more than the students, most instruction being delivered to the whole class, the teacher determining class time, a reliance on textbooks and the seats being organised in rows. This is reflective of Cole and Engeström's (1993, p.8) observation that, "when activities become institutionalized, they are rather robust and enduring" seeming to "reproduce similar actions and outcomes over and over again in a seemingly monotonous and repetitive manner". An enduring characteristic of secondary schools are the rules that exist to regulate behaviour in a way that is considered appropriate to the purpose of the organisation (Cohen and Manion, 1981) and these have come to determine the range of learning experiences that are available.

Rules are inevitably compliance-driven, with teachers encouraged to have appropriate classroom expectations and rules to guide student behaviour (Gable *et al.*, 2009). These are intended to make behaviour predictable so that it is easier for teachers to manage and therefore routines are considered an important feature of a well-ordered classroom environment. Brown and McIntyre (1993, p.54) conceptualised the types of behaviours that teachers cultivate as 'Normal Desirable States of Pupil Activity' (NDS) and commented that teachers perceived a lesson to be satisfactory "so long as pupils continued to act in those ways which were seen by the teacher as routinely desirable." Indeed, when asked about their teaching, teachers tended to frame their replies in terms of what students were doing so that progress² made, in terms of completing a task, was secondary to maintaining particular NDS (*ibid.*). Although NDS may differ between teachers and even within

² 'Progress' has come to be a loaded term in education, whereby it specifically refers to student progress towards the grades they are predicted to achieve in high stakes tests. This manifests as an accountability measure called the 'Progress 8' score. When Brown and McIntyre (1993) were writing, the word did not have the same connotations and it is used in keeping with their meaning here.

different parts of a lesson, students nevertheless become familiar with what is expected by a teacher at any one time. Gutiérrez, Rymes and Larson (1995) described the “script” that all members of a classroom become familiar with and which is constructed through repeated interactions over time, which essentially provides students with a frame of reference for a teacher’s NDS.

While the focus here seems to be very clearly on maintaining particular forms of student behaviour, the impact on learning should not be underestimated. Through mechanisms such as NDS and scripts, however loosely we may use that term, teachers influence both how learning can occur and what constitutes knowledge in their classroom. Where a teacher’s NDS requires that students are silent for a significant amount of a lesson, they inevitably reduce the value of some voices (the students) and prioritise others (their own), thus collaborative learning is unlikely to be prevalent. In this way, the teacher can impose a view of learning which suggests that knowledge is private and that it must be acquired from an expert. Thus, the type of rules that teachers establish are influenced by the wider context of education outlined previously. These rules, in turn, shape and are shaped by, the learning opportunities that teachers provide.

The kind of collection curriculum (Bernstein, 1975) that currently exists in English secondary schools has become dominant because it supports the assessment framework by which teachers, and school leaders, are held accountable. Torrance and Pryor (1998) define the type of convergent assessment imposed on schools as that which aims to identify whether a student knows, understands or can do a predetermined thing; here, the student is “subservient to the curriculum” (Leat, Thomas and Reid, 2012, p.404). In this context, the most appropriate forms of teaching are deemed to involve precise planning, a clear focus on the curriculum, closed or “pseudo-open” questions and quantitative evaluation (Torrance and Pryor, 1998, p.153). Thus, “convergent assessment is congruent with classroom routines and structures of discourse” (*ibid.*, p.155), epitomised by teacher control within a system of consequences and rewards. Yet there is an alternative approach to assessment and learning which is closer to the type of pedagogy appropriate to SOLE. Divergent assessment aims to discover what a learner

knows, understands or can do, thus teaching requires flexible planning, the interaction of learner and curriculum, open questioning and tasks, and descriptive, as well as judgemental, evaluation (*ibid.*, p.153). This approach rests on the assumption that all learning must be constructed by students so it frees them from subservience to the curriculum. In practice, convergent and divergent approaches to pedagogy are best understood as a continuum (Pryor and Crossouard, 2008). Thus, while teachers have little choice but to accept the convergent form of assessment, imposed as it is by the national government, there is still the possibility of creating opportunities for students to experience a more divergent approach within the classroom, where a teacher can develop a capacity to balance the two (Torrance and Pryor, 1998). While SOLE is clearly closer to the divergent approach, which contrasts with the dominant activity in schools, it can still be possible for teachers to use it in a secondary school context, with some careful reflection on how and when it might be appropriate.

The types of pedagogy that are evident in schools reflect assumptions about learning and the way that it occurs. Sfard (1998, p.5) has described two metaphors for learning and the 'acquisition metaphor', whereby we conceive of the "human mind as a container to be filled with certain materials" and the "learner as becoming an owner of these materials", is apt in the secondary school context because knowledge is essentially a commodity, gained to ensure success in high stakes tests. Knowledge therefore exists independently and can be transferred to students (Blau, Grinberg and Shamir-Inbal, 2018) to become their individual property. Clearly, this has epistemological implications because it makes assumptions about what learning actually is, but the acquisition metaphor does not necessarily dictate one pedagogical approach, for example it does not negate the possibility of students constructing their learning, so that teachers could organise their classrooms to facilitate students having a more active role, if that suited their epistemic stance. Nevertheless, the impact on the wider education system is clear, defined as it is by high stakes tests, and thus the acquisition approach cannot be disregarded by teachers within an accountability framework. Sfard's (1998, p.6) second metaphor for learning was the 'participation metaphor'. Here learning is perceived as a process of doing and is never

separated from the context in which it occurs. This metaphor is evident in communities of practice (Lave and Wenger, 1991) in which learning is peripheral participation. Thus “the permanence of *having* gives way to the constant flux of *doing*.” (Sfard, 1998, p.6 emphasis in original) and knowledge becomes an aspect of practice, something that is only evident through actions, rather than a private possession. Although there are clear differences between these two ways of understanding learning, Sfard (*ibid.*) was careful to note that neither is without issue and both are probably necessary. Certainly, it is difficult to take the participation metaphor to its furthest extreme, which would seem to imply that learning is purely situational and the learner carries nothing with them between contexts (*ibid.*). Yet it is also problematic to reify the acquisition of knowledge because, as is evident in secondary schools currently, it can result in learning becoming “disaggregated and decontextualised from real-life experience.” (Leat, Thomas and Reid, 2012, p.401). In addition, the acquisition metaphor fails to adequately address the fundamental question posed by the ‘learning paradox’, first raised by Plato, which asks how we can want to “acquire a knowledge of something that is not yet known to us” (Sfard, 1998, p.7). Some of these concerns can be resolved by viewing the metaphors as “offering differing perspectives rather than competing opinions” (*ibid.*, p.11) and recognising that each may be appropriate in different circumstances.

SOLE does not appear to fit neatly into either metaphor. Certainly, the understanding of knowledge as something private, to be acquired by individuals from an expert source (Blau, Grinberg and Shamir-Inbal, 2018), does not work in the collaborative ideal of SOLE, where learning depends on communal co-authoring and there is no single ‘right’ answer. The process that students go through during SOLE and the changes in their learning behaviours are considered too fundamental a part of the experience for the acquisition metaphor to be sufficient. Yet the participation metaphor, which does focus on learning as a process of doing, is not quite adequate either because the knowledge acquired during SOLE is about more than “an expression of personal perspectives regarding the learning topic” (*ibid.*, p.35). The learning outcomes from SOLE, in terms of knowledge, remain significant. A third metaphor has been suggested by Paavola, Lipponen and

Hakkarainen (2004, p.558), the 'knowledge-creation metaphor', which "strongly emphasizes the aspect of collective knowledge creation for developing shared objects of activity". Here learning is understood as an active attempt to "generate new ideas and outcomes" which are tangible (Blau, Grinberg and Shamir-Inbal, 2018, p.35), however an individual is not seeking to add to their own existing knowledge, so much as solve problems and advance communal understanding (Paavola, Lipponen and Hakkarainen, 2004). Although school students are not likely to produce "*historically novel ideas*" (Paavola and Hakkarainen, 2005, p.555, emphasis in original), they can nevertheless assume responsibility for advancing shared knowledge as individuals embedded within communities (*ibid.*). This would seem to most closely approximate to the learning that might emerge in an ideal SOLE. However, SOLE differs from the Knowledge Building communities that have typically been associated with the knowledge-creation metaphor as it applies to school learning (Paavola, Lipponen and Hakkarainen, 2004; Paavola and Hakkarainen, 2005). Knowledge Building (Scardamalia and Bereiter, 2005) is a carefully scaffolded approach in which an electronic Knowledge Forum provides students with ready access to each other's ideas in the form of notes. This forum facilitates the co-authoring of knowledge through debate, evidence gathering and theory refinement (Scardamalia, 2002), which is a much more structured approach to sharing knowledge than SOLE offers. Another contrast to SOLE concerns the role of the teacher because, while the emphasis is on sharing cognitive responsibility with students, the teacher is still integral in terms of, "helping students shoulder their responsibilities and advancing knowledge along with them." (*ibid.*, p.21). This is a significant departure from the diminishing of the teacher's role that SOLE suggests by recommending they "Stand back and trust" the students (Mitra, 2014a, p.15). Finally, Knowledge Building does not suggest particular activities that should be undertaken, rather it is a set of principles within which teachers should work that are "presented as pedagogical design parameters with teachers and students engaged as innovators and developers in a research-intensive process to develop and continually improve principle-based practice." (Zhang *et al.*, 2011, p.265). This principle-based approach sits at one end of a spectrum which has, at the other extreme, a procedure-based approach,

where principles are not explicit and an innovation manifests as a sequence of activities, and in the centre, principle-based procedures, whereby principles are made explicit and established activities translate them into practice (*ibid.*). There are some interesting parallels between Knowledge Building and SOLE, together with some significant differences, and the knowledge-creation metaphor seems relevant to both.

Identifying an appropriate metaphor illuminates the scale of the challenge that teachers face in attempting to introduce SOLE to English secondary school contexts because SOLE requires a very different approach to the acquisition metaphor that is prevalent. Understanding knowledge as something to be acquired, that is essentially private but which can be used to demonstrate that an individual has made progress has, of necessity, seen a convergent pedagogy dominate. There is evidence that students are indoctrinated to this approach, becoming anxious during activities that represent a shift from what they are used to in case they are not being given the 'right' information and preferring to be told what they need to know by a teacher, particularly when they are close to high stakes testing (Hockings, 2009; Leat, Thomas and Reid, 2012). SOLE, then, is not merely a new strategy, although teachers may conceive of it in this way, rather it represents a "paradigm shift" that "explodes conventional understandings of school learning", just as innovations such as Project Based Learning have done previously (Leat, Thomas and Reid, 2012, p.401). It should therefore be considered how appropriation of SOLE may be sustainable in this context.

2.3.4 Is Innovation in this Context Possible?

The weight of institutionalisation in schools is coupled with a highly centralised system in which the tendency at present is to move deeper into a convergent approach to assessment, as demonstrated by the recent return to linear exams at both GCSE and A level, the introduction of a revised National Curriculum intended to have "a greater focus on subject content" (Department for Education, 2010, p.42) and the reduction in value of vocational subjects in the accountability system (*ibid.*). This context of accountability, which has helped to perpetuate the dominant approaches to teaching and learning outlined above, make it increasingly difficult for

individuals to experiment with new teaching strategies, particularly where they have the potential to conflict with national policy. Such constraints limit the freedom of teachers to experiment, regardless of the extent to which they might value or believe in the innovations available.

Despite the pressure that teachers clearly feel to focus on “safer, relatively closed teaching approaches” (Leat, Thomas and Reid, 2014, p.102), innovative pedagogies often appeal to those same teachers as an “antidote” (*ibid.*, p.103) to the wider context of the education system in which they act. Yet it is that very context which means that teachers struggle to both introduce and sustain innovative practices because the motive that drives use of an innovation can come into conflict with the motive of the dominant activity (Sannino, 2008; Yamazumi, 2008). Cuban (1993, p.265) found that when student-centred reforms were attempted in America, two thirds of teachers continued teaching how they always had and a further quarter of teachers selected a small number of techniques to incorporate into their practice, ignoring the rest. Only 5-10% of teachers “introduced as faithful a replica of those ideas as they could”. Similarly, Leat (1999) concluded that, regardless of context, the number of teachers likely to embed an innovation in any one school was rarely more than three. One explanation for this is that innovations often serve to disrupt the routines and norms that teachers have worked hard to establish in their classrooms over time (Cohen and Manion, 1981), but even where teachers are eager to reform, or to disrupt norms, sustaining an innovation is particularly challenging in the current educational context unless it directly supports teachers in preparing students to pass high stakes tests (Solomon and Lewin, 2016). Thus innovations, such as SOLE, that constitute a divergent approach and pose a challenge to understanding learning purely in terms of acquisition of knowledge (Sfard, 1998), are likely to be particularly problematic because they contradict the national discourse about education.

On this basis, Sannino (2008) suggests that we should re-evaluate the way in which we conceive of implementing innovative strategies. She documents an example of a successfully introduced innovation where all the participants explicitly stated that they wished to continue the programme, yet it was

abandoned the following year. This was due to a range of contradictory motives rooted in systemic tension which gave rise to personal conflicts, identified as challenges to competence and agency, a willingness to continue the innovation against balancing workload, the requirements of normative school work and the demands of the curriculum. Thus “The logic of the participants’ respective leading activities ... dominated and constrained their perceptions.” (*ibid.*, p.337). Each of the conflicts outlined above have the potential to manifest during a teacher’s attempts to use SOLE and thus it is evident that appropriation of SOLE in a secondary school is rife with challenge. Yet Sannino (*ibid.*) argues that in such contexts it might be necessary to redefine sustainability to include the types of transitional actions that teachers make which neither continue the innovation exactly, nor represent a return to normal teaching. These actions might be attempts to continue with the innovation, but they may also be “oriented at enriching or changing the dominant activity from inside in small steps.” (*ibid.*, p.337). Thus, one measure of success might be whether an innovation is transplanted wholesale into a school, but an alternative should be a consideration of the extent to which it changes wider practice through transitional actions (Sannino and Nocon, 2008). This is similar to the way in which Fullan (2016, p.29) contrasts a fidelity approach, where an innovation is implemented faithfully, with a mutual-adaptation or evolutionary approach, in which an innovation is adapted through use so that it ends up being an amalgamation of the original innovation and the user’s contextual situation. While some are implicitly critical of the dilution that can occur when innovations are hybridised in this way, for example Cohen and Mehta (2017, p.649) dismissed them as a form of “weak implementation” of the original, it is worth noting Cuban’s (1993, p.287) observation that “a reform journeying from invention to adoption to implementation to incorporation into daily routine will get transformed in the process.” Perhaps all attempts to appropriate innovations are susceptible to some level of adaptation and surely some measures to accommodate the context of that innovation are likely to be necessary. Thus, an alternative approach to sustainability could be understood as a “transformation of localized practice as aspects of an innovation contribute to potential enrichment and development of those

practices even though the overall innovation itself is visibly discontinued.” (Sannino and Nocon, 2008, p.326). Given the challenges that are apparent in the current educational context, this definition seems valid and it is perhaps in this light that teachers’ appropriation of SOLE in secondary schools should be viewed.

2.4 Conclusion

This chapter has presented a review of the literature relevant to this study. Beginning with a critique of SOLE itself, I have explored both the research that preceded its development and the extent to which that research justified the form that SOLE ultimately took. I have positioned this study as one of the first to research SOLE use in an English secondary school context. The remainder of the chapter described that context, starting with a historical overview of national education priorities and explaining how those have shaped the current educational climate. I reflected upon the approach to learning that predominates in secondary school contexts, as well as considering alternatives, particularly in relation to SOLE. Finally, I considered the extent to which innovation might be possible in this context, concluding that wider definitions of sustainability might be necessary. The next chapter aims to provide a theoretical framework for this study.

Chapter 3. Activity Theory

3.1 Introduction

The purpose of this chapter is to clarify the frameworks and concepts that informed analysis of data during this study. I will begin with a brief statement regarding the relevance of Activity Theory (AT) to my research, before introducing the theory itself with a discussion of its evolution through three generations. I will focus on the object, as the element which defines an activity, and explain how I have applied this concept in my own research. I will also discuss the concept of contradictions which is pertinent to my research questions. I will then explore how AT has been used as a research framework in the existing literature before finishing with a consideration of the implications for this particular study.

3.2 Identifying Activity Theory as the Framework

As is usual with qualitative research, my findings were considered through a theoretical lens in an effort to make sense of the empirical data. It was clear in the early stages of this research that, while SOLE was the focus of this study, it could not be separated from the context within which it was appropriated; innovations are not “independent variables” (Russell and Schneiderheinze, 2005, p.38). Initially, I assumed that the teachers themselves were the defining element in SOLE appropriation and I began by considering the data from a teacher agency perspective. Given that the context was also significant, I was particularly interested in Priestley, Biesta and Robinson’s (2015) model of ecological agency because it considers the teacher’s position both in terms of their past and their views of the future through the iterative and projective dimensions, as well as placing that in context which they call the practical-evaluative dimension. However, as I attempted to analyse my data using this model it became clear that I had not adequately addressed the iterative and projective dimensions during data collection and therefore the majority of my data needed to be understood through the practical-evaluative dimension. Thus data analysis using this model became very unbalanced. In addition, I did not feel comfortable making judgements regarding teacher agency because it seemed to me that all the teachers who participated in this research had agency, even those who

chose not to participate in SOLE which I interpreted as an agentic action. Yet I did not have an appropriate range of data from which to offer explanations for why some teachers chose to use SOLE, or not, based around the iterative and projective dimensions of the ecological agency model. Finally, the practical-evaluative dimension simply did not seem to offer sufficient scope for discussing the wider context that was impacting upon SOLE appropriation.

Thus it had become clear to me that the context itself, which was so influential in determining the nature of appropriation, needed to provide an overall context for data analysis on a number of levels. The stark differences in appropriation in each school derived in part from the specific culture that developed around SOLE use, while the similarities, particularly relating to the difficulties and tensions that teachers encountered, were in part explained by the wider historically informed cultural setting within which the schools existed. Thus, both the complex social environment and the way that SOLE was appropriated required analysis and AT appealed because it offered a way to consider both, acting as “a *lens, map, or orienting device* to structure the analysis of complex sociocultural learning and performance contexts” (Barab, Evans and Baek, 2004, p.207 emphasis in original). Once I began to analyse the data using an AT framework, it was soon apparent that it had great explanatory value for the data I had collected; this will be discussed further in Chapter 4.

3.2.1 The Evolution of Activity Theory

AT is based on the concept that “the human mind emerges, exists, and can only be understood within the context of human interaction with the world; and ... this interaction, that is, activity, is socially and culturally determined” (Kaptelinin, Nardi and Macaulay, 1999, p.28). Thus, consciousness exists within activity: “you are what you do” (Nardi, 1996, p.7). AT has emerged in three distinct phases. The first generation was initiated by Vygotsky’s concept of mediation (Vygotsky, 1978), the second generation incorporated both Leont’ev’s definition of activity as the unit of analysis and Engeström’s expansion into a social context and the third (current) generation has begun to consider the interaction between activity systems (Engeström, 2001).

3.2.2 Generation One: Mediation Through Artefacts

Vygotsky (1978) first articulated the concept of mediation between a subject and an object, where an object is understood as a “problem space” towards which activity is directed (Engeström, 1993 p.67). This “insertion of cultural artifacts into human actions was revolutionary” (Engeström, 2001 p.134) because it determined that individuals could not be understood without reference to their context, in the form of culture and society, and society could not be understood without consideration of the agency of individuals (*ibid.*). Thus, Vygotsky resolved the dichotomy of human cognition and behaviour as separate from their environment (Barab, Evans and Baek, 2004). This concept of mediation through cultural artefacts also demanded consideration of a wider context for human activity because tools have historicity which impacts on how they are used, even while they are being reproduced during the activity itself in a process of “continuous construction” (Engeström, 1993 p.67). Hence this first generation of AT established that a subject (individual) transforms an object (problem space) into an outcome using tools.

3.2.3 Generation Two: Collective Activity

Building on Vygotsky’s work, Leont’ev elaborated on the definition of human activity and identified this as the basic unit of analysis. He gave prominence to the object as the way to differentiate between activities,

“Thus, the principle ‘unit’ of a vital process is an organism’s activity; the different activities that realise its diverse vital relations with the surrounding reality are essentially determined by their object; we shall therefore differentiate between separate types of activity according to the differences in their objects” (Leont’ev, 1981, quoted in Barab, Evans and Baek, 2004 p.202, emphasis in original).

With the concept of activity thus defined, the focus remained on the activity of an individual rather than a collective endeavour until Engeström suggested that it was necessary to explore the relationship between the individual and their community in any activity because this formed a vital part of the context. He argued that it must be a historically located activity which formed the basic unit of analysis, not a socially-mediated individual activity (Blackler, 2009), thus moving beyond the activity itself to conceive of an activity system (Issroff and Scanlon, 2002). To conceptualise this,

Engeström introduced a third component to the existing subject – object relationship, that of community. The community – subject relationship is mediated by rules and that of community – object by division of labour (*ibid.*). The subject is “the individual or subgroup whose agency is chosen as the point of view in the analysis.” (Engeström, 1993, p.67). The community comprises all those who share the same general object. The relationship between subject and object is mediated by tools, which might be symbolic or physical but which are cultural artefacts imbued with historicity. Community and subject are mediated by rules which can be implicit or explicit regulations, norms or conventions governing social interaction. The object and community are mediated by the division of labour which is the “explicit and implicit organisation of a community as related to the transformation process of the object into the outcome.” (Issroff and Scanlon, 2002, p.78). The mediating elements are both historically formed (Kuutti, 1996) and continuously reproduced as they not only impact on other elements of the system, they are also reformulated by them (Engeström, 1993, p. 67). The evolution of activity theory is depicted in figure 3.1.

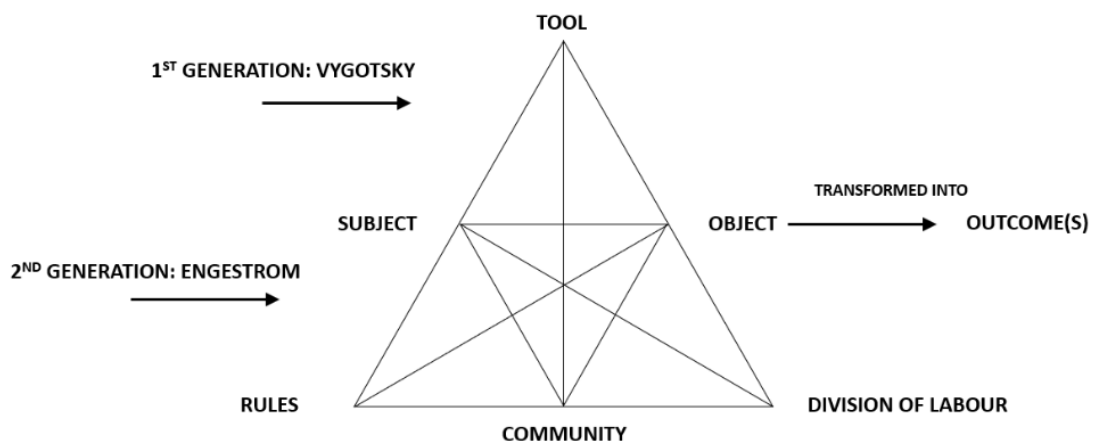


Figure 3.1 The structure of an activity system

Adapted from Engeström (2001)

This graphic depiction of AT as a triangle is seen by some as a weakness of the theory because it can suggest that an activity is static and structured (Yamagata-Lynch, 2003; Roth, 2004), with little ability to capture the underlying dynamism or the interaction between elements of the system that is so integral. By choosing to represent an activity in this way there is a

danger that researchers present a “snapshot that informs at the same time as it reifies.” (Barab, Evans and Baek, 2004, p.210). Certainly, the triangles themselves are limited in terms of detailing the richness and complexity of an activity and its context, however it should be noted that the triangles are not the end point of a research project (Yamagata-Lynch, 2003), rather they are a way to graphically and simply represent the components of an activity. They should simply act as a starting point for the description and analysis of activity, which is how they have been used within this research.

3.2.4 The Object of an Activity System

Having briefly outlined the different components, or nodes, of the activity system, the object will now be considered in some detail as it is the most contested element of the activity system and it forms the basis of one of my research questions. The object is central to AT because it defines the activity. It is ultimately the ‘sense-maker’ (Kaptelinin, 2005) because it is that which the whole activity is directed towards; without it, the actions taken within an activity system may seem random. “An activity is a form of doing directed to an object. Activities are distinguished from one another by their objects. An activity is motivated by the need to transform the object into an outcome” (Issroff and Scanlon, 2002, p. 78). Thus, it is the object which gives the activity meaning. Leont’ev (1981, cited in Barab, Evans and Baek, 2004, p.202) used the analogy of a hunt to articulate the difference between an individual’s actions, for example the person beating the ground to flush the animals out, and the activity itself, which is the collective hunt. Taken alone, the action of beating has a goal, but it is the object of the collective activity which gives that action meaning and purpose, making sense of the individual action. As the object is the reason for the existence of an activity system, it gives “continuity and coherence” to the actions of individuals within that system, (Engeström, 2000, p.964). From such an understanding of the object it might be assumed that it is simple, transparent and something that the subject is conscious of, yet this is not necessarily the case, “The object should not be confused with a conscious goal or aim. In AT, conscious goals are related to discrete, finite, and individual actions; objects are related to continuous, collective activity systems and their motives.” (Engeström and Escalante, 1996, p. 360). Objects are as dynamic as any other part of an

activity system and need to be understood as “simultaneously given, socially constructed, contested, and emergent.” (Blackler, 2009, p.27).

It is argued by Kaptelinin (2005) that motive and object are often mistakenly perceived to be interchangeable terms. Part of the reason for this is linguistic because AT originated in Russian and German and these languages have two different words for ‘object’, for example in German, there is *objekt* which is an entity, and *gegenstand* which is motive-object. Thus, an *objekt* would be “that which is to be realized such as a cure for cancer” while motive-object refers to the reason for finding the cure, such as “making the world a better place linked as a motive to the object of a cure for cancer.” (Nardi, 2005, p.39). Addressing this linguistic and conceptual difficulty is beyond the scope of this thesis. However, it is important to be clear about how the object is understood within this research and my contention is that the object is separate to a subject’s motives because an activity can have multiple motives, whereas there can be only one object defining the activity system (Kaptelinin, 2005). In a collective activity system, many different people are involved resulting in a multiplicity of, sometimes conflicting, motives which are bound together “through relations of conflict, power, resistance, and acquiescence.” (Nardi, 2005, p.40). Within such a system, individuals have needs and are motivated to respond to them, but those needs only become “objectified” when they are defined by an object (Kaptelinin and Nardi, 2012). The object is therefore a representation of how a need will be met which only becomes apparent in the process of doing (Kuutti, 1996). The motive for an activity is also created by a need, but the motive is satisfied by the transformation of the object into an outcome. An activity system is dynamic and the constituent parts are inter-related, therefore the object is not merely a representation of the subject themselves, it is constructed and reproduced throughout an activity as other elements of the activity system impact upon it, “objects of activities are dynamically constructed on the basis of various types of constraints. These constraints include the needs that the activity at hand is striving to satisfy, available means, other potentially related activities, and other actors involved,” (Kaptelinin, 2005, p.17). A range of motives can lead to internal conflict as subjects find that their ideal representation of the object is subsumed within the reality of their context.

3.2.5 Defining the Object, and Activity System, in This Research

It is clear that the commitment within AT to the basic unit of analysis being an activity is not straightforward. After all, an activity can be as small as writing a research paper or as large as educating the nation's children. As Bakhurst (2009, p.206) notes, it is almost impossible to find an activity that does not fit with the AT model, yet this theory does not have any explanatory value for activities such as walking a dog. In educational research, there is no clear guidance about the criteria that should be used to define an activity (Barab, Evans and Baek, 2004). It is common for a researcher, investigating a particular innovation, to make the implementation of that innovation the object and thus the activity system is bounded by the various efforts to achieve that 'object'. Similarly, Engeström (2017, p.360) has noted the propensity to focus on one classroom as an activity system, commenting,

“The classroom is commonly taken as the focal and exclusive microcosm of learning. Studies that encompass the whole school are surprisingly rare. Yet ... the school is a peculiar activity system that has its own historically formed characteristics that constrain and shape what is possible within a classroom.”

Despite the preponderance of research that identifies one innovation or classroom as the unit of analysis, such an approach would seem to fall short both of Leont'ev's conceptualisation of an activity being defined by the object (Barab, Evans and Baek, 2004), and of Engeström's (2017, p.357) assertion that an activity is “durable systemic and collective”, with durability arising from the object. The former suggests that a researcher should start by identifying the object and using that to delineate the activity system, rather than finding something of interest to research and designating it the object (Benson, Lawler and Whitworth, 2008), while the latter implies that an object is long term and both historically and culturally informed. I would argue that to authentically incorporate those features, an object is likely to encompass more than simply a new innovation. In addition, it is clear that objects are emergent, not arbitrarily decided by a researcher; Nardi (2005, p.41) is critical of the “bloodless” way in which they are described in much of the literature, which offers little insight into “the bumptious nature of object construction and instantiation”.

Thus, I concur with DeVane and Squire (2012, p.257) that “an intervention alone does not constitute its own new activity system”, rather “educational interventions are more akin to tools that subjects appropriate in their effort to transform the objects.” Thus, I conceived of SOLE as a tool within an activity system, which could be used to work towards a wider object, rather than the object in and of itself. If we accept that an object is more than simply a motive or an outcome, then we must consider what it means to give an activity ‘meaning’. Attempting to implement an innovative practice such as SOLE does not necessarily give meaning to the actions taken as part of the SOLE session. A teacher might carry out certain actions, such as generating a big question, in order to implement SOLE, but she might also tell direct students to look at a particular website or to take their coats off. Such actions are not understood in terms of her efforts to implement SOLE, they are understood with reference to the object of the wider activity in which she is continuously engaged, namely the educating of students. Therefore, rather than understanding a teacher’s lessons, including SOLE, as a series of discrete activities it is clear that greater meaning is afforded when conceptualising her actions as part of that overarching activity. Thus, educating students is the object of the activity system as I have identified it in this research. This is not to suggest that all activities that are school based are automatically part of the education activity system, an activity is not physically bound in that way and indeed I argue later that the SOLEs which took place at Hillside School took place in a neighbouring activity system, albeit on the same physical site (see Chapter 5). However, to isolate an ‘activity’, such as the implementation of SOLE, and hope to understand it without reference to the wider activity of which it is a part is likely to result in a flawed analysis. To return to Bakhurst’s (2009) earlier critique, AT therefore has greatest explanatory value when the activity has been properly defined according to a collective cultural-historical object, such as educating students; walking the dog is not in itself an activity, as defined with reference to AT, rather it is an action that might form part of a wider activity system.

However, the concept of educating students does not sufficiently explain the object as it currently exists in the education system. As previously noted, an object is not static, rather it is emergent and can be difficult to identify. I

would argue that the definition of 'educating students' is one that fluctuates and becomes reconstructed over time, therefore, one hundred years ago it would have had a different meaning to that which it has now. Following my discussion of the current educational context in Chapter 2, I would argue that the object of 'educating students' has been significantly reduced over recent decades so that, in effect, it now means preparing students to pass high stakes tests. It is not controversial to suggest that the outcome that secondary schools work to achieve, as driven by the national government, is almost exclusively results focused. The object is partly historically and culturally constituted and, as such, it is relatively stable: the educating of students is a durable concept that has existed for over a century. However, the object is also emergent, and as such the specific form it takes is subject to change. At present, the object of educating students remains, but it manifests in a narrow form whereby the extent to which that object is achieved is measured almost exclusively by high stakes test results. Consequently, those results are the outcome that teachers and secondary school leaders require from any activity within the education system. Failure to achieve these outcomes has become increasingly punitive and so the focus on preparing students for those tests has become ever more relentless. This object is created at the national level and enforced in secondary schools through the rules, tools and division of labour that exist. It is also reinforced at school level, whereby the wider system is considered to be so dominant that no other object is possible.

3.2.6 Contradictions

Another significant feature that emerged from the second generation of AT is the concept of contradictions and these are particularly pertinent to this research because SOLE was so different to the dominant activities of English secondary schools that contradictions were arguably inevitable. It was the way in which those conflicts were resolved, or not, which ultimately became the focus of this research. Activity systems are complex and dynamic and as such, "equilibrium is an exception and tensions, disturbances, and local innovations are the rule and the engine of change." (Cole and Engeström, 1993, p.8). Contradictions denote conflicts or tensions within or between elements of an activity system, or across systems. They can manifest within

one node of the system, for example conflict caused by contradictory rules, or between nodes, for example between the rules and the community, or across activity systems themselves, for example between school and home environments. It is the contradictions that arise during an activity which can drive change; however, they can also prove difficult to resolve, at which point the scope of an activity might be reduced (Russell and Schneiderheinze, 2005).

Some are critical of the use of contradictions within AT, arguing that they become the focus of the research, resulting in a preoccupation with problems rather than consideration of what works (Issroff and Scanlon, 2002).

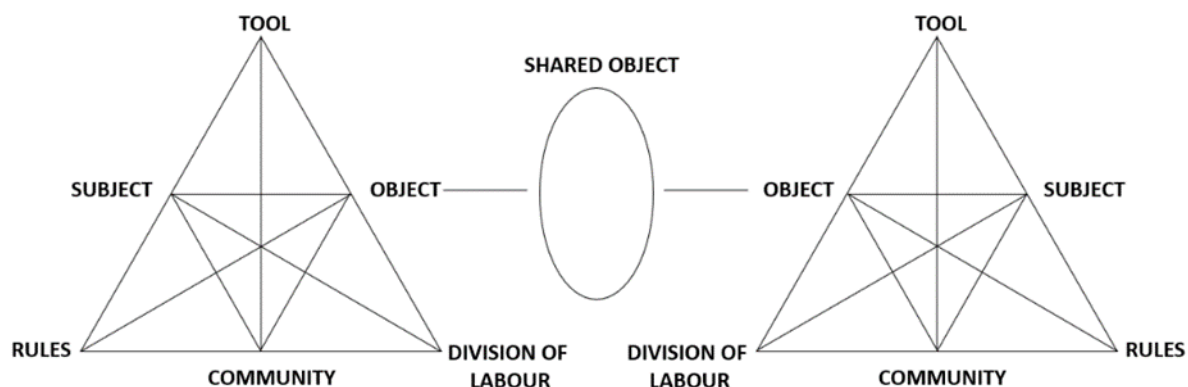
However, Engeström (2001) argues that such conflict is the norm in any activity system and that it can in fact become the source of change. Without such tension, there would be little motivation for innovation and the status quo would be maintained. Indeed, at times, a collective willingness to resolve contradictions and embrace change can lead to the expansive transformation of an activity system “when the object and motive of the activity are reconceptualized to embrace a radically wider horizon of possibilities than in the previous mode of the activity.” (*ibid.*, p.137). There is perhaps too great an emphasis on the transformative power of contradictions, with Lee (2011, p.418) claiming that AT “allows the possibility of transforming schools via a politics of hope”, whereas this research found that the wider national context of education is too stifling to support transformation. Nevertheless, exploring the concept of contradictions was particularly pertinent here because SOLE clashed with so many aspects of typical schooling and it was the way in which these tensions were resolved, or not, which would influence the extent to which SOLE use might become sustainable in these contexts.

3.2.7 Generation Three: Interacting Activity Systems

The third, and current, generation of AT evolved from a recognition that activity systems are not isolated entities, they exist within networks and are influenced both by other activities and by external factors (Kuutti, 1996). To address this, Engeström (2001) expanded the unit of analysis from one activity to at least two interacting activity systems, see figure 3.2. This generation of AT requires the development of “conceptual tools to

understand dialogue, multiple perspectives, and networks of interacting activity systems.” (*ibid.*, p.135). It also opens up a range of possibilities not found within a single activity system analysis, specifically learning across the boundaries of activity systems which Engeström (2001; 2009) refers to as expansive learning. This type of activity involves researchers working with practitioners to transform their work so the object becomes “the entire activity system in which the learners are engaged”, thus aiming to produce “culturally new patterns of activity.” (Engeström, 2001 p.139). With this new perspective on AT, it thus becomes possible to both analyse the interactions between activity systems and to conceive of ways that learning could transcend the boundaries of a singular system.

The scope of analysis can therefore extend beyond a single activity at a time, however during this research it seemed that third generation AT oversimplified the concept of



*Figure 3.2 Interacting activity systems in third generation AT
Adapted from Engeström (2001)*

interacting systems. Activities are characterised as discrete entities which can be analysed both separately and at a point of interaction and there appears to be an assumption that the nexus of contradiction is always between objects,

“emphasis on the analysis of the activity system(s) is directed towards contradictions and tensions with specific emphasis on the object of the activity and the outcomes. The production, distribution and selection of artefacts tends not to be highlighted in the analysis.” (Daniels, 2004, p.124).

This approach risks oversimplifying the types of interaction that might manifest between systems. For example, the teaching and learning within one teacher's classroom is itself an activity, yet clearly the minimal meaningful context of that activity, which should bound the unit of analysis (*ibid.*), encompasses both the wider school activity system and the national education activity system. Thus SOLE is a tool used at one level of the activity system, the school, and it would be difficult to understand the way it is appropriated without reference to the dominant activity of the school in which it is embedded, specifically the learning that happens most of the time, or to the national context where control is centralised and within which the school system sits. The actions of participants at each level of the system are in part dictated by the wider systems surrounding them; it seems meaningless to try and understand one without the other and restrict analysis to interactions around a shared object is limiting. Clearly activity systems are ultimately embedded in society itself and it is neither possible nor helpful to extend an analysis that far. However, where the wider context is so influential on the particular level of activity that is being analysed, it seems clear that it should be given some consideration.

Third generation AT also appears to offer equal weight to all interacting activity systems, with little consideration of the power dynamics within and between them (Daniels, 2004). In education the distribution of power cannot be ignored because the activity system at a national level exerts considerable influence over school activity systems, for example through the use of tools such as league tables, rules such as Ofsted grade descriptors and a division of labour which dictates centralised control. The prescriptive nature of these elements of the national activity system have the effect of dictating what the object will be for schools, with little negotiation, and thus what the desirable outcomes will be. This is problematic when considering the intersection of activity systems, because one can be significantly influenced by another, yet this power dynamic is not addressed within third generation AT.

3.3 Activity Theory as a Research Framework

3.3.1 The Existing Literature

Since AT was described as “the best kept secret of academia” (Engeström, 1993, p.64) there has been an increase, described by Roth (2004) as exponential, in both the use and application of the theory. It has been used in a variety of fields, including human-computer interaction (Nardi, 1996) and healthcare (Engeström, 2000; 2001) and currently there is a growing body of literature in which AT is used to either analyse or design elements of educational practice. Some of this literature focuses on how AT can support change or innovation in education, for example, Jonassen and Rohrer-Murphy (1999) used AT as a framework to design a constructivist learning environment while Russell and Schneiderheinze (2005) explored the factors that impacted upon the introduction of such a learning environment. Similarly, a number of studies have analysed approaches to Knowledge Building using AT, for example Aalast and Hill (2006) and Hewitt (2004) found that introducing knowledge building to traditional school environments could cause conflict due to the changed nature of the object which was inconsistent with students’ existing understanding of school learning. AT was offered as a framework within which pedagogy aimed at Knowledge Building could be improved (Aalast and Hill, 2006). There are also examples of AT being used to explore learning supported by technology, which resonates with SOLE learning, such as investigating the changing nature of community afforded by online learning courses (Barab, Thomas and Merrill, 2001; Barab, Schatz and Scheckler, 2004) or a consideration of the impact of technology on teaching and learning (Issroff and Scanlon, 2002); here AT was found to provide a useful language for describing some of the challenges that students and teachers faced. Such studies suggest that AT is an appropriate framework for this research, concerned as it is with the introduction of a technology-based innovation.

There is also a growing body of literature which uses the AT concept of contradictions to generate understanding of an aspect of teaching and learning. Yamagata-Lynch and Haudenschild (2009) took teachers as the subjects and focused on the conflict arising from the intersection of two

activity systems, the teacher's professional development activity and that of the school district and university, finding that the lack of a shared object created difficulties for teachers. Barab *et al.* (2002) used contradictions to understand activity in a classroom where a new course was introduced, concluding that the course was object-directed, which has implications for supporting transformative learning. I found contradictions to be particularly useful for understanding why SOLE appropriation was difficult for teachers in an English secondary school context.

3.3.2 Implications for This Research

As discussed above, there are a number of examples in the literature of AT being used to describe and understand the kinds of themes that are present in this research. However, many who use AT are quick to note that it is a "powerful and clarifying descriptive tool rather than a strongly predictive theory" (Nardi, 1996, p.7). This is appropriate to the type of case study approach that forms the basis of this research because, as will be argued in the next chapter, it is the rich description arising from analysis of the data that enables practitioners to identify the extent to which research findings might be applicable to their own context (Stake, 1978). However, it is worth noting that AT "cannot represent the complexities" of the entire system and thus there must be a process of simplification that is both "systematic and purposeful" and this can help to ensure that the interpretation of the data is trustworthy (Yamagata-Lynch, 2010, p.33). One significant rationale for using AT for this research was the way in which it required a consideration of both human behaviour and context, rather than a separation of the two as though they did not impact upon the other. This is appropriate for a school environment where there is capacity for teacher agency, but there are also limitations and affordances arising from the context itself. Thus, consideration of the components of activity should allow practitioners to consider the extent to which specific elements of their own context are similar or different and thus to make informed decisions regarding SOLE appropriation in their own environments, using the actions of the participants here as a guide. AT is also useful for analysis of complex human environments, imbued with both historicity and culture, and schools are

undoubtedly examples of such environments, indeed those elements help constitute the activity that is generated in schools (Yamagata-Lynch, 2010).

When carrying out a piece of AT research, Jonassen and Rohrer-Murphy (1999) argue that a qualitative methodology is necessary to be consistent with the social constructivist nature of the theory. The study must be concerned with real-life practices over a relatively long timeframe, in order for change to be identified. In addition, varied data collection should take place to support the researcher in “understanding the activity system from all of these different perspectives.” (*ibid.*, p.69). In the following chapter, I will outline how the methodology of this research adhered to this guidance.

3.4 Conclusions

This chapter has provided the theoretical framework for this research. The evolution of AT has been discussed, with particular reference to contentious elements that are relevant to this study. I discussed the concept of the object and have justified my understanding of the object as it emerged in the activity systems during this research, specifically the educating of students. Detailed description of the activity systems, as they manifested in each school during this study, will be provided in Chapter 5. I explored the notion of contradictions in AT and explained how they are pertinent to this research. I also questioned both the analysis of interacting systems as it is presented in third generation AT and the absence of any discussion regarding power relations between activity systems. I have briefly outlined the uses of AT that can be found in the existing literature, before concluding with some justification of why this is an appropriate theoretical framework for my research. In the following chapter, the methodology of this study will be described and justified.

Chapter 4. Methodology

4.1 Introduction

The purpose of this study was to consider the ways in which SOLE was appropriated in secondary schools in England and this chapter outlines the methodological approach taken. It begins by positioning the research in terms of its ontological and epistemological assumptions, before describing and justifying both the research design and methods of data collection and analysis. The participating schools will be introduced and a brief overview of their general contexts will be given. I will explain how this research fulfilled its ethical obligations and the chapter will end with consideration of some of the limitations arising from the data gathered.

4.2 Ontological and Epistemological Position

The very act of posing a research question presupposes an ontological and epistemological position, whether considered or intuitive, because it is the researchers position on these philosophical issues which will “shape the very questions we may ask in the first place, how we pose them and how we set about answering them.” (Grix, 2002, p.179). The nature of the research questions for this research clearly imply a constructivist and interpretivist foundation would seem to be an obvious home for educational research, where even the term education is “essentially contestable” (Pring, 2000, p.9). However, within education a positivist paradigm has tended to prevail (*ibid.*).

Positivism is a term coined by Auguste Comte (1798-1857) to denote a third phase of history: theological explanations had already been replaced by the metaphysical and Comte argued that the third phase would occur when science supplanted metaphysical speculation (Comte, cited in Schwandt, 2001, p.199). Thus, from its conception it was understood that positivism would move knowledge beyond the realms of superstition, faith or speculation to arrive at truth. Within this paradigm it is assumed that there is a single objective reality which exists independently of how we interpret it, thus there are facts which can be gathered, measured and independently verified (May, 2011). The ‘truth’ of a phenomenon is not only desirable, it is attainable. However, the way that true knowledge is discovered remains contestable even amongst adherents of positivism: empiricists claim that

knowledge is justified by sense perceptions and observations while rationalists conceive of reason as the means to knowledge through *a priori* ideas, such as theories (Ayer, 1956). These positions are not mutually exclusive because crucially both are foundationalist, seeking “permanent, indisputable criteria for knowledge” (Schwandt, 2001, p.71). Positivists extend these assumptions to the understanding of human behaviour as something which can be predicted, observed and measured, indeed they claim that there is no qualitative difference between the natural and social world (Hitchcock and Hughes, 1995). This does not correspond with the beliefs that underpin this research. The notion that, in social terms, there is a “single, tangible reality ‘out there’ that can be broken apart into pieces capable of being studied independently;” (Lincoln and Guba, 1985, p.28) simply does not apply to classrooms which instead seem to be characterised by multifaceted experiences reflecting the perspectives of up to thirty students and a teacher at any one time. Hence although the philosophy of the positivist paradigm is clearly evident in education, where learning is so often reduced to easily measured outcomes and classroom management procedures based on reinforcement and reward can be traced back to the behaviourist traditions of Pavlov (Pring, 2000, p.31), the research that logically follows from such a position seems limited in terms of what it can tell us about human behaviour in general, and teaching and learning in particular. Any research involving the actions, thoughts and feelings of human beings will not fit neatly into quantifiable elements that can be measured and manipulated because people have different histories, understandings and priorities which mean that their behaviour can appear to be random and arbitrary, defying prediction and routine. While it would be disingenuous to suggest that quantification does not have its uses in education research, or indeed in education itself, it is vital that such methods are complemented by others which seek a deeper understanding: we must consider ‘why’ as well as ‘how many’.

Identifying knowledge regarding the social world of human behaviour therefore requires a different paradigm and as early as the nineteenth century German writers in the romantic and idealist traditions recognised that a single approach to learning about the world was unsatisfactory due to

the “fundamental differences between human beings and inanimate objects in the natural world: they think, can experience emotion, and have free will.” (Travers, 2001, p.7-8). If the social world that people inhabit is observably different to the natural world then trying to explain it in the same way, using the same reference points, is clearly problematic and makes no concession to thought or opinion. As human interaction relies on our ability to interpret and make sense of each other’s behaviour and is enhanced by mediation through language, it seems illogical to suggest that the opinions and experiences of those living in the world would be irrelevant to any explanation of human activity.

Constructivism has evolved as an alternative ontological position which addresses some of these issues. This paradigm is anti-foundationalist, based on the position that humans do not discover knowledge but construct it based on shared understandings arising from historical and sociocultural dimensions. More specifically, social constructionists believe that everything is socially constructed and emphasise the definitions that the actors themselves provide (Schwandt, 2001). In this paradigm it is clear that knowledge is subjective, filtered through consciousness and shared experience, an approach which, in assuming that facts are created rather than discovered, prioritises the significance of context. This is not necessarily to deny the existence of any tangible reality, even within the social world, although adherents to the ontology of created reality might go so far (Lincoln and Guba, 1985). Rather, as Pring (2000, p.51) elucidates, we can distinguish between different types of trees and while the categories that we devise to distinguish between them are a social phenomenon “it depends upon there being features of the world existing independently of me which makes such distinctions possible.” This acceptance of a reality, albeit one we might never be able to ‘know’ fully, permits us to assert not that there are multiple realities, but that there are multiple ways of perceiving reality based around the socially developed constructions that we inherit. Such a perspective also allows for the significance of context, both in a wider cultural sense and more specifically to individuals (*ibid.*). Thus, the motivation for research within the social world is not the opportunity for explanation, sought by positivism, but for gaining understanding from the actor’s perspective (Schwandt, 2001,

p.273). This approach resonates because it values context and culture and puts interaction at the centre of human behaviour which aligns closely to AT and the principles underpinning this research. Another way of viewing this enquiry is as an attempt to understand how SOLE is constructed by teachers within the complex social context of an English secondary school; it is the meaning and the value which teachers ascribe to SOLE, as well as the way they make sense of it in context, which is of interest.

A key criticism of research based around a constructivist, interpretivist philosophy is that it is so context-dependent that it has no transferable value. In reality, as David Hume (1711-1776) observed almost three centuries ago, using observations about the past to prove a general statement about what will always happen does not constitute absolute proof (cited in Luscombe, 2000, p.72). Even in the natural sciences, where generalisations are intended to be “assertions of *enduring* value that are *context-free*” (Lincoln and Guba, 1985, p.110 emphasis in original), there must always be a degree of doubt about their validity given that generalisations can decay, for example diseases can become resistant to drugs over time (*ibid.*, p.115). Thus, generalisations should remain open to debate in any discipline but they are particularly difficult even to form in education given the “fluidity, spontaneity, and creativity of classroom life.” (Hitchcock and Hughes, 1989, p.27). Despite this, Pring’s (2000) contention is reasonable, that even in the social world parameters exist within which we can organise meanings, recognising what is typical of people in a given situation and finding similarities between contexts as well as differences. There is, after all, a range of responses and behaviours to which most people conform most of the time which applies to classroom life as fully as to any other context. Pring (*ibid.*, p.95) warns against the ‘uniqueness fallacy’ which is “to argue from the fact that everyone or every group is unique in some respect to the claim that everyone and every group is unique in every respect ... We are all unique in some respects and not in others.” Undoubtedly each and every classroom experience has elements which are unique but there will also always be aspects which are common to other classroom experiences and thus it is the researcher’s responsibility to offer sufficient detail about context to enable a

practitioner to judge for themselves the extent to which the findings might be transferable. That is one of the aims of this research.

4.3 Relevance of Qualitative Methodology

A researcher's choice of methodology will inevitably be influenced by their existing ontological and epistemological philosophies, after all how we conceive of the world predetermines what we believe it is possible to know of it (Grix, 2002). While it is not necessary or desirable to restrict the use of particular methodologies to specific research paradigms, nevertheless the methodological approach most appropriate to this research was that which is mostly commonly associated with an interpretivist paradigm: qualitative.

A qualitative researcher "is likely to be searching for understanding rather than facts; for interpretations rather than measurements; for values rather than information." (Watling and James, 2007, p.355). The questions guiding this research were concerned with the ways in which SOLE was appropriated in a particular context, thus the perceptions of the participants, or those who were appropriating SOLE, were paramount. The ways in which teachers interpreted and constructed their SOLE experiences were thus recognised as "meaningful properties of social reality" (Mason, 2002, p.63). Aiming to understand teachers' sense making, motivations and actions would begin to generate a rationale for how and why they acted which could itself be used to inform future practice and research. It was only possible to gain these insights in context, through the type of "rich data" (Geertz, 1973) typically associated with qualitative research.

As SOLE was a new phenomenon the initial intention was to take an exploratory approach which was flexible enough to allow the research questions to develop from emic issues (Swanborn, 2010) and thus there was no clearly defined set of research questions at the outset. Such an iterative-inductive approach could only be effective within a flexible and open research design. Gillham (2000, pp.2-3) suggested that there are two kinds of evidence that can be collected, that which is "manufactured" by the researcher themselves, the scientific approach, or that which needs to be uncovered and tested by reasoned arguments, which he termed the "judicial" approach. Although it is reasonable to suggest that evidence in qualitative

research is generated rather than merely uncovered, for example through interviews or observation, nevertheless this broadly corresponds to the epistemological position underpinning this research regarding how we can learn about and endeavour to understand human behaviour. Thus, it seemed most appropriate to adopt an open and explorative methodology, in line with this 'judicial approach', because the use of SOLE in secondary schools had not previously been researched and so there was little indication of what might be found.

4.4 Research Design

4.4.1 Comparative Case Study

Case studies enable the detailed study of a particular phenomenon in a specific context. They facilitate an "*intensive approach*" whereby "a researcher focuses on only *one* specific instance of the phenomenon to be studied, or on only a handful of instances in order to study a phenomenon in depth." (Swanborn, 2010, p.2, emphasis in original). This design is also well suited to research, such as this, which asks 'how' or 'why' questions, where a researcher has little control over events and where the focus is on a "contemporary phenomenon (the 'case') in depth and within its real-world context." (Yin, 2018, p.15). Case studies are particularly appropriate within an interpretive epistemology because "The exploration of a particular case is essentially interpretive, in trying to elicit what different actors seem to be doing and think is happening." (Bassegy, 1999, p.44). This research focused on the use of SOLE, the phenomenon, in two English secondary schools, the cases, thus a descriptive and explanatory multiple case study design was appropriate. Multiple cases enabled a depth investigation of two schools in order to gain a greater understanding of how SOLE was appropriated in different settings, as well as cross-comparison of the cases to try and appreciate how far the appropriation of SOLE was influenced by the wider English school system. Thus, this research encompassed the national context of a centralised education system, the more local contexts of each school and the role within those schools of the teachers themselves. Figure 4.1 demonstrates this multiple case study design. This methodological approach enabled an in-depth exploration of the phenomenon in its natural setting and

with close attention to the interpretations or constructions of the teachers themselves. Such a design was also deemed suitable for capturing and managing the range of data available, not least because it could accommodate multiple data sources (Denscombe, 2010).

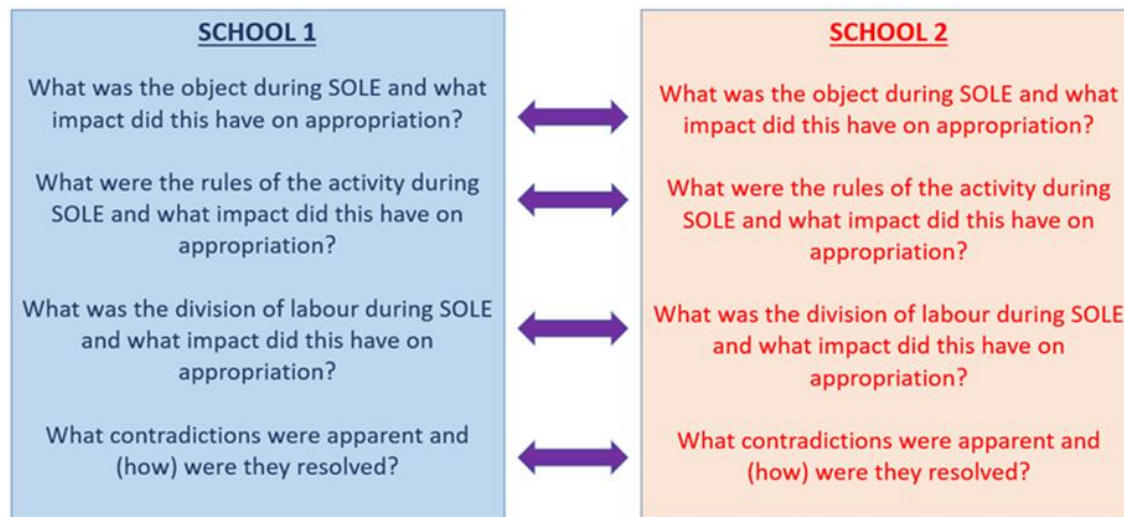


Figure 4.1 Multiple Case Study Design

4.4.2 Selecting the Cases

From the beginning, I identified the ‘Schools in the Cloud’ that Mitra established as part of his TED Prize win as the cases that I would research, including those in India, because they were useful test cases. Initially, I intended to do a comparison of the different ways that SOLE was appropriated in the two countries. However, as part of the process of becoming more familiar with SOLE I undertook a short pilot project in one of the English schools, as described in Chapter 1. During this process I became fascinated by the way that both teachers and students responded to SOLE in the English secondary school context, which resonated with my original reasons for embarking upon this research in terms of the contrast I perceived between dominant school practices and SOLE. I also came to realise that SOLEs were not necessarily being done in the Indian locations, which were located in a whole range of different contexts and only one of which was attached to a school, because the focus there tended to be more on the children learning English and how to use the computers. I therefore took the decision to disregard the Schools in the Cloud in India and focus exclusively on the appropriation of SOLE within the English secondary school

environments which made the context of the SOLEs an integral part of my research. I felt that focusing on understanding appropriation in one overarching context would allow me to meaningfully explore the implications for other similar schools.

The cases selected were therefore chosen at an early stage of this research and they were appropriate for a number of reasons. They were the only two locations in England where Mitra established SOLE Rooms, investing some of the money from his TED Prize win. Although this made the schools unusual, arguably 'extreme' or 'unique' cases according to Yin's (2009) classification, as the only schools to have SOLE Rooms funded and supported by Mitra himself, nevertheless this was partially an advantage because it meant that the research would not become dominated by practical issues such as finding Internet-enabled computers or trying to create an appropriate SOLE environment. Instead, the focus could be on how SOLE was appropriated when it had been made as simple as possible for teachers to access and experiment with, in a purpose-built setting. From this, it seemed fair to assume that any barriers to SOLE in these cases would potentially be multiplied in other schools, given the additional complications that teachers might face. It is also worth noting that while Mitra (2014a) suggests that a specific SOLE environment is desirable, he maintains that it is not absolutely necessary and teachers can conduct SOLEs anywhere if they have Internet-enabled computers. Therefore, the room itself should not be the deciding factor in whether a teacher might use SOLE and the wider findings from this research can be applied to other schools even where they do not have designated SOLE spaces. In addition, the two schools were already working with Mitra and were therefore open to the prospect of working with, and accommodating, another researcher. One of the schools was particularly convenient as I had worked there prior to embarking on this research and thus not only did I have much wider access than might otherwise have been granted, I did not have to rely on a gatekeeper to connect with individual teachers. While I had no pre-existing relationship with the other school, I was welcomed by both the headteacher and the individual with responsibility for SOLE, with whom I quickly established an effective working relationship. One further advantage of these schools was convenience as they were both based

in the north east of England where I live. Having easy access to the two locations meant that I could visit regularly and often and this flexibility made it much easier to organise interviews, observations and visits.

4.4.3 Participating Schools

- **Case One: Hillside School**

Hillside School was a smaller than average-sized secondary school in a semi-rural area in the north east of England where students were predominantly of white British heritage with English as their first language.³ In October 2012, at the last Ofsted inspection prior to this research, there were almost 700 students on roll aged between eleven and sixteen. At that time, the proportion of students eligible for Free School Meals (FSM) was above the national average while the number of students supported by either School Action Plus (SAP) or a statement of Special Educational Needs (SEN) was lower than the national average. In its latest Ofsted inspection, which took place approximately fifteen months before this study began, the school was judged to be 'Good' on all measures. During this study the school experienced some upheaval when it merged with another local secondary school and the process of establishing cross-school systems, together with some restructuring of staffing, took place. While the students remained on two separate sites, the teachers began to travel to teach on both campuses.

- **Hillside School: Introduction of SOLE**

The headteacher of Hillside School described it as a school that had moved from "*more didactic, traditional teaching*" to one with "*a commitment to creative teaching and learning*" (Headteacher). This process was supported and facilitated by staff at the Community Arts Centre, a resource attached to the main school site, which the headteacher called a "*centre for creativity and creative learning.*" (Headteacher). It was in this centre that the SOLE Room was located and as such it was the responsibility of Emily, the Community Arts Centre Manager, (a non-teacher).

³ All the information about Hillside School included in this paragraph was taken from the Ofsted Report that was current during my data collection (October, 2012). In an effort to ensure anonymity, I have not provided a link to that report here.

- ***Case Two: Longford School***

Longford School was an average-sized secondary school in a semi-urban location in the north east of England where students were predominantly of white British heritage with English as their first language.⁴ In May 2012, at the last Ofsted inspection prior to this research, there were just over 1000 students on roll aged between eleven and eighteen, of which 116 were in the Sixth Form. At that time, the proportion of students eligible for FSM was in line with the national average while the number of students supported by either SAP or a statement of SEN was lower than the national average. In that same Ofsted inspection, which took place approximately eighteen months before this research began, the school was judged to be 'Outstanding' on all measures. Around the start of this study the school experienced two significant changes. Firstly, the headteacher was asked to oversee another local school on a temporary basis, thus becoming executive headteacher of both. This involved him spending half of each week away from the school, with the deputy headteachers acting as heads of school in his absence. Secondly, the school was awarded Teaching School status with effect from September 2014 which enabled them to offer in-house teacher training, in conjunction with Newcastle University, together with a programme of courses to support more experienced teachers.

- ***Longford School: Introduction of SOLE***

Longford School perceives itself as progressive in teaching and learning terms, with an openly articulated commitment to both innovation and learning. This is a message that is driven by the senior leaders, indeed it was the headteacher who first introduced the SOLE concept to the school, as discussed in Chapter 5. Communication between Mitra and a teacher who was interested in developing SOLE resulted in Longford School being asked to accommodate one of the seven SOLE rooms created as part of the TED Prize. The Longford School SOLE room was designed by a committee of students and it officially opened in November 2013 (Schoengold, 2013). It

⁴ All the information about Longford School included in this paragraph was taken from the Ofsted Report that was current during my data collection (May, 2012). In an effort to ensure anonymity, I have not provided a link to that report here.

was located in the school's Design Technology department, which was separate from the main school building. The student committee continued to meet after the room itself had opened, taking some responsibility for managing the room as well as for promoting SOLE both within school and at external conferences.

- ***Comparison of contexts***

Superficially, these school contexts were similar; Table 4.1 provides a comparative overview of their general profiles. Both were based in the north east of England and the student bodies had reasonably similar profiles, although one key difference was the existence of a Sixth Form at Longford School. Both schools also shared similar ideals regarding learning and the optimal educational experience that could be offered to students, although the headteacher at Longford School considered innovation and creativity to be embedded within the learning experience, whereas at Hillside School they were still in the process of achieving that. Both schools were perhaps atypical in that the headteachers were not only supportive of staff experimenting with SOLE, they welcomed the opportunity to house one of Mitra's SOLE rooms as a physical manifestation of their commitment to innovation and did not perceive this to be incompatible with the pressures of accountability on secondary schools in England. In addition, senior leaders in both schools decided that it was appropriate to leave SOLE use to the discretion of individual teachers and focused instead on supporting and encouraging staff to use SOLE through their CPD programmes. Significantly, both schools also experienced a time of transition during this study although the impact on staff at Hillside School would have been significantly greater as they had to integrate with another school, its students and staff at the behest of the local authority. At Longford School there was no change to teacher responsibilities or to their daily routines and, although there was some change to the roles of senior leaders who took on more responsibility to compensate for when the headteacher was away, for most staff the school continued to run much as normal. Significantly, both schools also experienced a time of transition during this study although the impact on staff at Hillside School would have been significantly greater as they had to integrate with another school, its

students and staff at the behest of the local authority. At Longford School there was no change to teacher responsibilities or to their daily routines and, although there was some change to the roles of senior leaders who took on more responsibility to compensate for when the headteacher was away, for most staff the school continued to run much as normal.

	Longford School	Hillside School
Location	Semi-urban, north east of England	Semi-rural, north east of England
Number of students	Just over 1,000	Almost 700
Ages of students	11-18	11-16
Ethnicity of students	Predominantly white British	Predominantly white British
Number of students eligible for FSM	In line with national average	Above national average
Number of students with SEN	Lower than national average	Lower than national average
Ofsted judgement at time of data collection	Outstanding	Good
Other information	Became a Teaching School in September 2014 Headteacher was executive head of this and another local school	Merged with a smaller local secondary school, January 2015 Community Arts Centre was an integral part of the school
SOLE Room opened	November 2013	February 2014
Person with responsibility for SOLE	Managed by a teacher with middle leadership responsibility	Managed by the Community Arts Centre Manager

Table 4.1 Comparative overview of school contexts during data collection

However, at Hillside School the impact on teachers' daily lives within the school was tangible, for example a process of restructuring was necessary to clarify areas of responsibility as the existing teachers and departments from each school merged into one. This required many teachers to renegotiate their identities both within their departments and the wider school and, in some instances, this had to be undertaken while adapting to a whole new role. In addition, the newly merged schools continued to be housed across two campuses, with students remaining on their original sites while teachers moved between them to teach across both. Clearly this resulted in a very different daily experience for teachers on a practical level, one with a clear time implication, but it also required them to adjust to new staff, buildings and students while trying to grasp a different set of systems and

expectations. It is clear that such upheaval would have impacted upon teachers and is likely to have led to a period of insecurity and uncertainty for all.

4.4.4 Generalisability of Case Study Research

While the two cases that formed the basis of this research were the schools themselves, the wider phenomenon under investigation was SOLE. Stake (2006, p.8) differentiates between intrinsic case studies, where the case itself is the main focus, and instrumental case studies, which go beyond the case; this research took the form of an instrumental case study. Stake (*ibid.*, p.6) terms the phenomenon to be investigated the 'quintain' and cautions that in instrumental studies, although single cases help us to understand it better the quintain itself must always remain the focus of the research. Thus, it was hoped that a variety of rich data could be gathered from each school in order to gain a greater understanding of how SOLE itself could be utilised within an English secondary school system. The schools as cases were therefore intended to help develop an understanding of the appropriation of SOLE as a contextualised phenomenon.

A case study research design has the advantage of flexibility, yet the lack of predetermined systematic procedures for undertaking such research can be misconstrued as a lack of rigour (Yin, 2018). While it seems overly simplistic to suggest that any methodology can inherently lack rigour, it is worth noting that all successful research depends on a careful, thoughtful and effective research design. This is not merely a plan of what the researcher will do, rather it requires consideration of "the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions." (Yin, 2009, p.26). A researcher must be open to differing interpretations and conclusions and should be prepared to address these in the data analysis phase of the research.

Case studies are characterised in part by their prioritisation of depth over breadth and the particular over the general (Denscombe, 2010, p.54). Yet this focus on specific, context-based knowledge also makes them vulnerable to the critique that they cannot offer generalisability or external validity: "the pursuit of scientific truth is taken to be vitiated by the inherent unreliability

and unreplicability of the singular case.” (Thomas, 2011, p.23). Bryman (2012, p.69) argues that the success of a case study when measured against criteria such as external validity “depends in large part on how far the researcher feels that these are appropriate for the evaluation of case study research” and he cautions that the terms of this deliberation are significantly influenced by the dichotomous parameters of the quantitative versus qualitative debate. The suggestion that abstract, context-independent knowledge is more valuable than practical, context-dependent knowledge is certainly contentious in the social sciences given that, as Flyvbjerg (2006) notes, surely all knowledge about human behaviour is context specific. For example, Bennett found that cocktail waitresses were able to remember up to forty drinks orders while working, in defiance of laboratory research demonstrating that people can remember approximately seven pieces of information at one time, which certainly supports such a contention (cited in Gillham, 2000, p.5). Thomas (2011, p.23) observes that while Plato advocated the value of universal truths, his student Aristotle emphasised *phronesis*, namely “practical reasoning, craft knowledge, or tacit knowing: the ability to see the right thing to do in the circumstances.” The only reasonable conclusion appears to be that there is value to both kinds of knowledge and, when considering the knowledge that governs the behaviour of classroom teachers, it is surely impossible to dismiss the role of *phronesis* which is how most practitioners build their craft, improve as teachers and know what to do in any given situation long after they may have forgotten abstract theories of learning and behaviour management. A rejection of context specific knowledge can lead us to “the absurd position that it is inappropriate to argue, gain insight or learn from particular examples, for fear that this might be thought anecdotal and, therefore, unscientific.” (Thomas, 2011, p.24). In my experience of teaching, this type of practical knowledge is commonly shared amongst colleagues and thus they depend on the craft knowledge of their fellow practitioners in order to improve.

This research project has an interpretivist and constructivist foundation and thus it would be inconsistent to suggest that I believe my findings represent an objective reality that I have uncovered. However, an argument for the value of context-dependent knowledge is not to deny the necessity of some

form of transferability, without which the legitimacy of case study research would be in danger of being undermined (Larsson, 2009). Rather it is important to carefully consider the type of generalisations that can, and should, be made. Stake (1978, p.6) argues for 'naturalistic generalisation'. This does not attempt to be nomothetic in the manner of natural science generalisations, rather it is "arrived at by recognizing the similarity of objects and issues in and out of context and by sensing the natural covariations of happenings. To generalize this way is to be both intuitive and empirical". If we accept, as surely, we must, that it is not possible to reduce authentic educational experiences down to a series of variables which can be predicted, manipulated and ultimately controlled, this type of generalisation can nevertheless offer an alternative, meaningful way to identify what might be transferable across classrooms and schools. The researcher should not be expected to identify who might make use of their findings, rather they have a responsibility to provide sufficient 'thick description' (Geertz, 1973) about the context they worked within that a practitioner can judge its relevance for themselves. This is especially pertinent when researching a new phenomenon such as SOLE where there is limited literature to support secondary school teachers who might want to incorporate it into their own classrooms; by describing the contexts of the schools, the experiences of those practitioners who have used it and the way they appropriated it within the parameters of their own contexts, another teacher can intuitively and empirically judge the extent to which it might be applicable to theirs. Larsson (2009) urges some caution regarding generalisations based purely on context as he questions the extent to which this presupposes that context alone determines the phenomenon. However, this would suggest a very narrow understanding of naturalistic generalisation, which is based on more than mere description, because the researcher can suggest observable patterns which might be recognisable in other, similar, contexts. This corresponds to Larsson's (*ibid.*, p.33) proposed generalisation through recognition of patterns, in which he concedes that context similarity is part of the process for recognising patterns, albeit not the only factor.

In order that such generalisations can reasonably be made, it is important to ensure the credibility of the findings presented. Credibility refers to whether

the participants' constructions of reality have been accurately understood and reconstructed by the researcher, according to the extent to which the detail given "reflects the language and meanings assigned by participants" (Ritchie *et al.*, 2014, p.357). Ensuring a close link between the data, findings and interpretations can help demonstrate an internal validity in which statements made are supported by the study (*ibid.*, p.356). As part of the research process, I incorporated member checks to validate the data, typically, though not exclusively, in conversation with participants which was felt to be less onerous than asking them to read transcripts. Thus, I am confident that the findings presented are accurate representations of the participants' experiences. However, this does not correspond to a belief that replication of this research would provide the same results again, which would be inconsistent with my interpretivist assumptions. Instead, I recognise that this particular study was specific to the time and place in which it was conducted and that it is my responsibility as a researcher to ensure the integrity of the data presented and interpretations given. This was achieved through peer review and prolonged engagement (Merriam, 2002), the former through discussions during supervisory meetings in which I was encouraged to discuss my interpretations and challenged to justify their credibility, and the latter because my period of data collection spanned a full year. This meant that I revisited both case study locations on a number of occasions which enabled me to continually review and check my interpretations.

No researcher can claim to embark on a study without preconceptions and, given my experience as a secondary school teacher prior to this research, it would be disingenuous to suggest that I did not have any existing beliefs about how SOLE might be appropriated in the two schools when research began. However, the process of recognising such bias enabled me to mitigate the impact of it by carefully re-examining my interpretations and considering alternatives. In this Methodology Chapter I have endeavoured to clearly and transparently articulate my reasons for making particular research decisions, exploring some of the challenges and problems that I faced and the actions taken as a result. In addition, I consider my experience in English secondary schools to have been of real value during the research process because it

afforded me a level of insight and understanding that might not otherwise have been possible.

4.5 Research Methods

4.5.1 Interviews

Interviewing is a collaborative activity based on interaction and shared sense-making between the interviewer and interviewee. In qualitative research, interviews generate a very particular type of data because they “provide us with access to social worlds, as evidence both of ‘what happens’ within them and of how individuals make sense of themselves, their experiences and their place within those social worlds.” (Miller and Glassner, 2016). Such interviews focus on the perspective of the interviewee rather than the concerns of the researcher and thus they aim to be flexible and tolerant of tangents in order to gather rich answers containing much detail (Bryman, 2012). Thus, carefully constructed questions can generate answers which proffer an insight into the internal thoughts and feelings of participants by granting some access to their insider perspective. Given that this research was concerned both with how teachers interpreted and constructed SOLE, such insight was vital.

However, the interviewer’s central role in the generation of data has led some to criticise the method for a lack of objectivity and thus to question the validity of the data produced in that it is not generalisable (Rapley, 2001). Although this definition of generalisability is rather narrow, it is nevertheless worth noting that interviewees can respond differently depending on who is interviewing them; when an interviewer is not considered to be a member of their group they may not be trusted (Miller and Glassner, 2016). Thus, the onus is very much on the interviewer to build a rapport with participants and the skill of doing so should not be underestimated. It is vital that participants feel respected and that the information they share is valued. My work as a secondary school teacher offered a distinct advantage here because it meant I was able to address interviewees on their own terms and to be sympathetic to, and knowledgeable of, any issues they described. This facilitated a useful adjustment of the power dynamic so that, to some extent, it moved from interviewer-interviewee to peer-to-peer. In reality this was more easily

achieved at the school I used to work in, where many staff already knew me as a colleague, but it was significant in gaining trust in both cases.

The interviews conducted were semi-structured, based on a brief schedule of questions (Appendix B). This was created to ensure that the same questions would generally be asked to each teacher in an effort to achieve some cross-case comparability (Bryman, 2012), however, “deviation from the agenda was expected and accepted.” (Limerick, Burgess-Limerick and Grace, 1996, p.451). Most of the questions were deliberately kept as open as possible so that participants could answer on their own terms, leading us to whichever issues or areas of interest were of most significance to them. In this way it was hoped that varied, detailed and interesting responses would be elicited. All data presented from interviews throughout this thesis is identified in brackets following the quotation, at the number or letter that teacher was allocated, for example (Teacher A). Teachers of Longford School were assigned with letters from A to W and those of Hillside School were assigned numbers from 1 to 11. The only exceptions are the two headteachers, whose interviews are denoted with (Headteacher) and the Community Arts Centre Manager at Hillside School who was given the pseudonym ‘Emily’ to clarify that she was a non-teaching participant. Appendix C provides an overview of the participants in this research from each school, detailing the nature of their involvement.

4.5.2 Recruiting teachers

At Hillside School I was able to attend a CPD session in which I was introduced to all the teaching staff and I followed this by placing a message in their staff bulletin requesting participants for interview. This generated little interest, presumably because I was unknown to most staff at the school. However, the person with responsibility for the SOLE Room, Emily, acted as a gatekeeper and as she had a clear overview of all the people using it, she was able to suggest some individual teachers that I could approach. Initially these were all people who had used SOLE and were positive about it, with the exception of one teacher who was unconvinced of its value. This was rectified later in the data collection phase when I asked Emily to suggest teachers who fell into specific categories, such as those who had not used SOLE or those

who were sceptical about it, and again she found teachers who were prepared to be involved so that ultimately the data was representative of a variety of views. One teacher who had been observed doing a SOLE session also agreed to be interviewed, which provided an opportunity to triangulate the two sets of data. In total, eight teachers were interviewed at Hillside School as well as Emily who, although a non-teacher, was nevertheless the most prolific individual user of SOLE in the school. The headteacher was also interviewed towards the end of the data collection phase so that I could elicit his views on how SOLE had been appropriated.

At Longford School I was invited to speak briefly to the whole teaching staff at the start of a CPD session. I introduced myself, though most already knew me from my time working there, described my research and asked for volunteers to take part. The majority of participants then approached me and expressed their willingness to be interviewed. I had been concerned that this would result in a biased data set because I instinctively felt that people who had positive experiences of SOLE would be more likely to volunteer. In reality I found I had a good range of perspectives, however during data collection it became apparent that people who had not used SOLE at all had not volunteered to take part, presumably because they felt they had nothing of value to contribute. On that basis I approached two teachers with little or no experience of SOLE to ask if they would be prepared to be interviewed and both agreed. One other way in which teachers were recruited for interviews was through SOLE observations. Two teachers who joined the school during my data collection period used SOLE on a few occasions and I was keen to interview them in order to triangulate the data I had from their observations. Again, both teachers were happy to participate when approached. In total, thirteen teachers were interviewed at Longford School and they were a group of people with widely divergent views. The headteacher was also interviewed towards the end of the data collection phase so that I could gain his perspective on how SOLE had been appropriated within his school.

4.5.3 Participant Observation

While interviews were invaluable for understanding how teachers perceived SOLE and why they might choose to use it, I also observed teachers

conducting SOLE sessions in order to understand how they appropriated it in practice. This provided an opportunity to become immersed in a particular setting, make regular observations of the teachers involved, listen to and engage in conversations and develop a cultural understanding of how people acted within that context (Bryman, 2012, p.432). The particular setting of interest was the SOLE Room within each school, so observations were limited to that location and I tried to attend as many SOLE sessions as possible within the data collection period. Swanborn (2010, p.2) describes this approach as “monitoring” which “helps us to describe and explain the history, the changes during the period under study and the complex structure of the phenomenon.” During the observations, I did not use a pre-prepared structure for recording what I saw, instead I kept my note taking entirely freeform and flexible. This was largely unavoidable because SOLE sessions both within and across the two schools could be quite different and thus a structured schedule would have been impossible to design. In addition, I began observations with an exploratory approach and made research decisions based on the data I collected as I progressively focused my research (*ibid.*), thus any note taking schedule would have quickly become redundant. This research evolved during the data collection. It was initially instigated in part by reflections on my own practice, which contrasted significantly with SOLE both in terms of framing and classification (Bernstein, 1975). Thus, I was interested in how teachers adapted, or not, to a non-interventionist role. In addition, the pilot project I had carried out in one of the schools prior to my data collection had contained some intriguing tentative findings regarding the extent to which the students themselves transferred their usual classroom rules and routines into the SOLE Room (Rix and McElwee, 2016). Therefore, my early observations were partly concerned with looking for evidence that both the teacher and students were enforcing their typical NDS in the SOLE Room. However, it became apparent that this was irrelevant at Hillside School, where the teacher was physically absent from the room for most of the session (see Chapter 5). In addition, all teachers at Longford School interacted with students to varying degrees but I could not meaningfully evaluate the extent to which that replicated their classroom practice because no observations were taken there. As data collection

continued, I became interested in the different types of interactions that teachers had with students, both in terms of actions taken that shifted the framing of the SOLEs into the students' favour, however marginally, and the interactions that aimed to mediate learning. I realised that these interactions still happened at Hillside School, albeit less frequently, because they were instigated by the students. These early observations developed over time and were ultimately conceptualised through AT notions of rules and division of labour. Thus, observation data helped generate an understanding of the practicalities of teaching SOLE in secondary schools and it complemented the interview data by offering an insight into how teachers acted in the SOLE environment. Triangulation of the interview and observation data added an additional dimension to the research.

The schools within which the research took place were closed settings but access for observations was unproblematic because the headteachers at each school had an existing relationship with Mitra and were happy to facilitate my research. As far as the teachers were concerned, my role as a researcher was known, however I was a "disguised" observer (Atkinson, 1981, quoted in Bryman, 2012, p.433) from the perspective of the students who either saw me as another teacher or as a guest, depending on how I was introduced by their class teachers. This lack of understanding regarding my role did not unduly concern me as the focus of my research was not the students but the teachers themselves and they all explicitly knew why I was there and had received an information sheet about my study (Appendix D). Although the aim was to observe as many SOLE sessions as possible throughout the data collection period, in reality it was not possible to attend them all and it might have resulted in an overwhelming amount of data had I managed to do so. As Swanborn (2010) notes "observations are collected continuously but irregularly during the relevant period." I observed as many sessions as I feasibly could and was particularly keen to try and observe SOLE sessions conducted by teachers whom I had also interviewed to allow for the possibility of triangulating that data. As the data collection progressed and I felt I had begun to understand the nature of SOLE appropriation in each school, I became more selective about the sessions I attended with my primary criterion being the "opportunity to learn." (Stake, 1995, p.57).

There are some limitations to participant observation. The very act of being present as an observer will inevitably impact upon the phenomenon you are trying to observe, potentially inhibiting the normal course of events. In an educational setting this can impact on the behaviours of both teachers and students. However, in Longford School many students knew me, and others came to know me over the course of my research, which was an advantage because they tended to feel fairly comfortable with me. The teachers almost all knew me as a colleague and thus accepted my assertion that I was not there to judge how they conducted the SOLE process. Some even considered my position as researcher to denote a level of expertise in the practicalities of SOLE and would ask for advice on how to conduct sessions, which I would politely evade giving because it was their own interpretations that interested me. At Hillside School the staff and students were so accustomed to having visitors observing SOLE sessions that they often seemed to barely acknowledge my presence. In addition to this, teachers were expected to remain outside of the SOLE Room for the majority of the session, as Chapter 5 explains in more detail, therefore there was an opportunity to spend time talking to them to put them at ease.

Another potential concern with observation data is the quality of field notes gathered, which inevitably are created from the perspective of the researcher and thus reflect their bias, interest and preoccupations. To some extent this issue was further exacerbated during this research because, as previously noted, I did not have a framework for recording observations. However, in an effort to ensure that my field notes fairly reflected what I had seen during SOLE sessions I did follow a protocol intended to minimise the impact of both the limitations of human memory and my own bias. This involved making my initial notes during the SOLE session itself, before writing them up in full at some point that same day. I adhered to the mantra of “if in doubt, write it down.” (Bryman, 2012, p.447) in order to be as comprehensive as possible. In an effort to create as objective a record as I could, I only noted personal reflections in a wide margin next to my recorded observations when I wrote the notes up. Thus, notes made during the session could focus solely on what I saw and heard. Considering both my research questions and the qualitative nature of my study, observation data seemed an appropriate method to

complement the interview data. All observation data presented throughout this thesis is identified in brackets following the quotation, with the letter or number allocated to that observation, for example (Observation A).

Observations at Hillside School were allocated letters from A to G (Observation F contained two SOLEs as two different groups of students participated consecutively) and those at Longford School were allocated numbers from 1 to 36. In the observation data, any information in round brackets denotes my reflections on what I saw, as recorded when my field notes were typed up shortly after the observation took place. Where it is relevant to the excerpt given, the SOLE question precedes the quote in square brackets. Appendix E provides an overview of the observations undertaken at each school, detailing the teacher responsible, the subject of the SOLE as it corresponded to the curriculum, the participating year group and the question asked.

4.5.4 Gaining Access to SOLE Sessions

At Hillside School the SOLE Room was booked through Emily, the Community Arts Centre Manager with responsibility for SOLE, or her assistant. Teachers would email a request to book the room at a particular time and receive confirmation by return email. As such, I relied on Emily keeping me informed about when SOLE sessions were happening so that I could attend. It was common at Hillside School for SOLEs to be observed by guests therefore teachers were never surprised to see me, however I would always remind them of my research and ensure I had their consent to observe at the start of the session. I was given consent to observe every SOLE session that I attended. My role during SOLEs at Hillside School was generally that of a Minimally Participating Observer (Bryman, 2012, p.443). I would be in the SOLE Room at the start of the session when the teacher shared the question, then I would sit outside the room with the teacher while the session was underway, returning to the room with the teacher for the debrief at the end. While outside the room I would speak informally with the teacher as we both observed what students were doing through the glass; these conversations were recorded as field notes where they were relevant to my research. Students typically saw me as a guest and largely ignored my presence, although I would occasionally contribute to the debrief at the end by asking a

question, when invited to do so by the teacher. Although my participation was undoubtedly less at Hillside School than at Longford School, this was essentially a reflection of the different roles the teachers themselves took during SOLE; at Longford School teachers were present in the room for the whole session, as was I, whereas at Hillside School the teachers' physical presence was reduced and I chose to stay with them, as the focus of my research, rather than with the students.

At Longford School the SOLE Room was booked by teachers using an online booking system. I was given access to this system at the start of the data collection period and therefore could see when teachers planned to conduct SOLEs so I could contact them directly, usually by email, and ask to go and observe. I was given consent to observe every session I requested to see except one. My role during SOLEs at Longford School was generally that of a Partially Participating Observer (Bryman, 2012, p.443) whereby I participated in core activities, interacting with students where they initiated contact, but not as a full member of the group as both I and they would defer to their teacher where appropriate. I was present in the SOLE Room during the sessions and students typically viewed me as a teacher, particularly those who had known me as such from my time working in the school, hence, they might ask me for assistance or include me in their dialogue. I would occasionally contribute to discussions during the debrief, if invited to do so by the teacher.

4.6 Ethical Considerations

All research raises ethical questions, particularly that involving people, and I was careful to safeguard all those involved. The proposed design and implications of my research were submitted to the Humanities and Social Science Faculty Ethics Committee for consideration and research in the field did not begin until approval had been obtained. As this is a piece of educational research I also ensured that I adhered to the relevant ethical guidelines of the British Educational Research Association (BERA), which suggested that all research should maintain an "ethic of respect" for the following: "The Person, Knowledge, Democratic Values, The Quality of Educational Research, Academic Freedom" (BERA, 2011, p.4).

Permission for this research was sought from the headteachers of the schools prior to the start and I obtained a current Disclosure and Barring Service (DBS) check for each school to ensure that they were protected should I end up on my own with students. This rarely happened because my focus was on the teachers so I usually stayed close to them. Participants were not at risk of harm during my research, indeed it consisted of observing them conducting SOLE sessions which would have occurred regardless of my presence.

Although this in itself had the potential to affect what was happening, as all observer presence can, I was very careful to reassure teachers that I was not there to judge them in an effort to minimise any stress caused through observation and to encourage them to keep their practice as normal as possible. All teachers were given the opportunity to refuse consent for observations or interviews, usually by email which might make such a refusal easier to give. In addition, participants were fully informed about the study as they were presented with a data sheet (Appendix D) and they were asked to sign a consent form (Appendix F) prior to participation.

Confidentiality was fully respected and I reiterated to participants, prior to interview or observation, that they were under no pressure to participate and could withdraw at any time. The topic of my research is not particularly emotive or sensitive, nevertheless care was taken to maximise anonymity of participants so that they could feel confident and safe when speaking freely. However, anonymity for all was difficult to guarantee because the schools in which Mitra set up the TED Prize 'Schools in the Cloud' are a matter of public record and I was aware that some individuals could be easily identified should anyone wish to. Despite this, I nevertheless chose to anonymise the schools on the assumption that people were unlikely to seek out this information, so identities could be more easily protected. Where possible I also limited the amount of identifying information provided about individuals, for example I did not place emphasis on the subject that a particular teacher taught. However, where people were obviously identifiable, such as the headteachers of the schools, I was honest about this when asking them to participate in the research and I encouraged those individuals to give careful consideration to agreeing to participate; no one withdrew from the research on this basis. While visiting the schools

regularly, I talked with participants about the data I was collecting and about the ways in which SOLE was being appropriated in each context. This dialogue informed my impression of what was happening but also ensured that participants were kept updated regarding my general findings. In this way, a situated ethics approach (Clark, 2013) was taken in which participants were understood to be able to contribute to decisions regarding the use of the data collected. I was conscious, at every stage of this research process, that my remit was not to make judgements regarding SOLE use, although I have not always been able to avoid this. Rather it was to explain the process that the schools went through and to identify the way in which the decisions made impacted upon that appropriation. Therefore when considering questions such as the extent to which SOLE was sustainable in each school, I have been careful to frame the discussion from the particular perspective of the schools themselves, according to what they hoped to achieve. This was important in ensuring that the information presented gave a fair representation of SOLE appropriation in each context. In this way, every effort has been made to treat the participants with an “ethic of respect” (BERA, 2011, p.4).

4.7 Data Analysis

Data analysis should be grounded in the ontological and epistemological assumptions of a research project and the approach taken here, wherein data was perceived as “windows on participants’ social worlds” (Spencer *et al.*, 2014, p.272), is consistent with the constructivist and interpretivist approach described above. However, such a grounding does not dictate the way in which data must be analysed and there are a range of possible approaches that can be taken. For this research, analysis of the data began with the process of personally transcribing the interviews and typing up field notes made during observations. This “fundamental aspect of the analysis process” (Gibson, 2010, p.297) facilitated full engagement with the data. As previously discussed, the research focus was initially kept very open because so little had been written about SOLE that it seemed unhelpful to predict the areas of interest that might arise from the data. Thus, when transcribing, I took an “unfocused” approach which allowed me to give consideration to all the data found while “trying to represent what was said or *meant* in a particular event

or interview setting,” (*ibid.*, p. 297, emphasis in original). This was an inductive approach, where the codes arose out of the data itself as opposed to fitting into a pre-existing framework (Braun and Clarke, 2006). However, while this allowed me to become very familiar with the data I had collected and was useful in helping to inform the ongoing data collection, it lacked any consideration of the conceptual problems underlying the research (Gibson, 2010).

While the initial focus of the research had been strongly concerned with teachers and their personal approaches to appropriation of SOLE, as discussed in Chapter 3, from this early engagement with the data I noted some interesting observations. In particular, it was clear that the national context of education directly impacted upon teachers’ actions when appropriating SOLE, and yet the differing approaches to implementation taken by the two schools meant that teachers’ responses to that national context manifested differently. It thus became clear that this research needed to engage with broader theoretical and conceptual issues in order to explain SOLE appropriation in practice. Similarly, the initial focus exclusively on teachers seemed insufficient to explain how they behaved and thus a theory that accommodated both context and teacher action was required. This eventually brought me to AT, in which the complex process of SOLE appropriation could be understood within a wider cultural, historical and social context.

AT, as the conceptual tool through which this research might be understood, is a social-constructivist theoretical framework which aligns with the ontological and epistemological positions outlined at the start of this chapter. Within this framework, it is understood that reality is constructed by those situated within it and, as such, meaning is particular to certain groups or cultures. As a result, the cultural, historical and social context of a phenomenon such as SOLE must be considered when trying to understand its appropriation in practice. This was important in helping to define the parameters of this research because it provided mechanisms both for investigating the particular elements impacting upon SOLE appropriation at a

local level, as well as for recognising the significance and impact of the wider context.

Although some form of data analysis had been undertaken concurrently with data collection, the identification of AT as a conceptual tool occurred at a fairly late stage of the data collection process. By this time, I had completed the first level of data analysis, specifically familiarising myself with the data (Abdullah, 2014) in an effort to generate early codes, and a move to a more deductive approach became appropriate. Taking the different nodes of activity as identified in AT, I went through a process of “lumping” the data (Saldana, 2009, p.29) with those nodes acting as a form of typology. This helped me begin to identify how different aspects of the activity system impacted upon SOLE appropriation in each context. The approach I took to data analysis was a fairly traditional one in that I read through all the data in Word and highlighted information in different colours according to the node of the activity system that was relevant. Initially, this was a broad brush approach whereby any element of the data that helped explain an aspect of the activity system was highlighted and I undertook the process more than once in an effort to ensure consistency regarding coding. Once this process had been completed, it was clear that some nodes, specifically the ‘rules’, ‘division of labour’ and ‘object’ appeared to be more heavily represented in the data than others. Judgements regarding significance were not made solely on the number of instances in which these codes were identified within the data set, although references to each were numerous in both cases, rather I was concerned with “whether it captures something important in relation to the overall research question.” (Braun and Clarke, 2006, p.82). Thus, choices were made regarding the significance of themes according to the extent to which it appeared to impact upon the appropriation of SOLE, as was evident from consideration of the data as a whole.

As my data analysis became more focused, I turned to data “splitting” to generate a more nuanced understanding (Saldana, 2009, p.30). Here, the broad categories that the theory imposed upon the data were refined to reflect the particular intricacies that were unique to this data set so that variations within, for example, rule use, could be identified. At this stage, I

moved away from highlighting data and instead added notes in the margin using the comment facility in Word. This enabled me to highlight similarities within the data while keeping it in its broader context, see Appendix G for an example of data analysed in this way. When I had been through all my data I created an overview of what I had found for each node, both from the interviews and observations at each school. These documents were invaluable for enabling me to maintain an overview of my findings and for identification of the most significant and interesting themes arising from the data, see Appendix H for examples of these overviews from each school. When presenting evidence from the data in this thesis I have taken an exemplification approach so that, when evidencing my findings, rather than reproducing every piece of data in which relevant information could be found, I have aimed instead to pick “compelling examples to demonstrate the themes,” (Braun and Clarke, 2006, p.95). On occasions, this might result in just one or two pieces of data, at other times it might include more; I aimed to include all data that helped to illustrate the nuanced nature of the findings.

Even once the data analysis process was well advanced, there were specific challenges pertaining to this data because some aspects of the activity system were difficult to separate. For example, there was considerable overlap between the rules and division of labour of the activity system during SOLE because the main rule pertaining to SOLE use, as teachers interpreted it, was that they were not permitted to intervene in student learning. While this is clearly a rule particular to the SOLE environment, it is also a reflection of the division of labour which accounts for where power is located during an activity because the rule regarding student independence effectively moved power away from the teacher and towards the student. It was therefore necessary to construct careful definitions relating to each component in order to ensure consistency across the data set.

Therefore, from the data analysis process there arose clear themes which helped to explain the way in which SOLE use was appropriated in the two case study schools. These centred around the AT concepts of rules, division of labour and the object of activity. It is worth noting that this is just one interpretation of the data, which could certainly have been analysed in

different ways. However, this theoretical underpinning was valuable in helping me to explain both how SOLE was appropriated in the two schools and why it happened in that way; these findings are explored in greater detail in the next chapter.

4.8 Limitations of the Data

4.8.1 Insider – outsider versus Outsider

At Longford School I was known to the majority of teachers and as such they considered me to be a colleague first and a researcher second which made access particularly easy; I was trusted and my credentials as a teacher were known and respected. As a result, a number of people volunteered to be interviewed after I had introduced my research to the whole staff. However there were some disadvantages to being known, particularly because it was common knowledge that I had left school to study the impact of SOLE and thus, in the minds of many, I was perceived to be pro-SOLE and it was assumed that I only wanted to hear positive things about it. As I was known to have good working relationships with members of the leadership team I also worried that people with less positive perceptions of SOLE would be reluctant to share them with me in case it seemed that they were anti-innovation or not supportive of the school's teaching and learning agenda. To combat such issues, I approached some people who I knew to be sceptical of SOLE but who I believed were also sufficiently confident to be open and honest with me. I reiterated that I would anonymise all data and I stressed that it was important that I heard a wide variety of views on SOLE in order to get a holistic picture. In all interviews I worked to overcome any perceived attempts to 'help' me by focusing on the positives about SOLE by being clear that I wanted any barriers to SOLE too. At these times I tended to emphasise my own experience of teaching and how different it had been to SOLE to indicate that I was conscious that such challenges existed and was open to hearing about them. Reassuring teachers both about the aims of my research and the fact that their honest opinions were what I needed to hear appeared to be effective and all teachers, to greater or lesser extents, spoke about both the positives of SOLE and the limitations or challenges they perceived.

At Hillside School I was an outsider in that no one knew who I was prior to my research. Even once it had begun, I was associated more with the Community Arts Centre than the everyday work of teaching and learning. This made it difficult to gain access, for example teachers were far less likely to volunteer for interviews because they had no reason to either want to help me or to trust me. In addition, the only way I could find out about SOLE sessions taking place was via Emily or her assistant and in the midst of all the things they had to do notifying me when SOLEs were taking place was understandably not a priority, resulting in me missing some sessions I could usefully have attended. While Emily was very happy to act as a gatekeeper and was effective at getting me access to people for interviews, she was understandably reluctant to bother teachers during busy or difficult periods, yet I was entirely dependent upon her for contact. Ultimately, although I interviewed fewer teachers at Hillside School than at Longford School, I believe that the ratio is reasonable and that the range of teacher views explored in both schools was fairly comprehensive. Emily's role as not only the manager of the SOLE Room but also the lead practitioner and public face of SOLE within the school, meant that her role as gatekeeper had the potential to impact on who was prepared to get involved in my research as those who believed in SOLE and were positive about it were more likely to volunteer. I circumvented this by explicitly requesting that Emily approach people with less positive attitudes towards SOLE, as identified during a CPD session that I had attended, and my final analysis suggests that the data from each school reflected a similar mix of perspectives.

4.8.2 Availability of Data at each School

The locations of the schools resulted in different data collection experiences because although both were relatively convenient, being in the north east of England where I live, Longford School is a ten-minute drive from my home whereas Hillside School is almost an hour away. This made it easy for me to maintain relationships with staff at Longford School by keeping myself visible and it also meant I could be very flexible about attending sessions at short notice. Hillside School was too far away to maintain the same kind of relationship as I could neither afford the time or the cost of visiting regularly if there was nothing tangible for me to experience in terms of data collection.

It was also difficult to attend some sessions that I was notified about at short notice.

While both schools are of equal significance as individual cases in this research, there is a significant disparity in the amount of data collected from the two. This partially reflects the difference in the number of sessions which took place at each school during my period of data collection: 191 at Longford School and forty-two at Hillside School. In fact, I observed a similar proportion of the sessions which took place at each school during my data collection period, which was approximately one fifth. At Longford School the SOLE Room had been open for one year and two months when I began collecting my data and although it had seemed little used at first, it had gained momentum by the start of my research there were typically a number of sessions each week that I could observe. In addition, I had access to the SOLE Room online booking system and therefore could organise all observations myself by liaising directly with teachers. I could also approach teachers directly to request interviews where appropriate. In total I interviewed thirteen teachers at Longford School and observed thirty-six SOLE sessions and I believe that this was sufficient to begin to give me a relatively representative overview of how and why the SOLE Room was being used.

The SOLE Room at Hillside School had been open for eleven months when I began collecting my data and although it was used with some regularity to showcase SOLE for visitors to the school, it was used significantly less often by classroom teachers as part of their usual practice. In addition, the process of merging with another local school began around the same time as my data collection and the effects of this were certainly being felt by teachers approximately six months into my research as they were finding out how the change would affect them in the next school year. For some teachers this might have been minimal, but for others it involved a change in role or partial relocation to a new campus. From month nine of my data collection period, the merger was taking effect and teachers were beginning to physically experience the changes, for example travelling between the two sites and getting to know their new colleagues. It seems likely that at this time many

teachers reverted to the teaching and learning strategies that they felt most comfortable with; interestingly, for the vast majority of teachers this did not appear to include SOLE. It is, of course, impossible to know the extent to which SOLE Room usage was affected by this major period of upheaval and whether my findings would have been similar at a different time. However, this is the reality of research in a complex, real world environment and periods of transition and upheaval are not necessarily uncommon in school contexts. Overall, I interviewed eight teachers at Hillside School and Emily, a non-teacher, and observed just eight SOLE sessions. Although on first consideration this appears to be problematic, the much smaller number of SOLE sessions that took place at Hillside School was reflective of the themes arising from this research. Additionally, although there were fewer opportunities for me to observe SOLEs there, the formulaic approach they took to SOLE compared to Longford School (see Chapter 5) meant that I felt I had a reasonably accurate perspective on how SOLE was appropriated there in a much shorter space of time. On that basis, I felt reasonably confident about drawing tentative conclusions based on comparisons of the two cases.

4.8.3 Data Collection Period Across a Calendar Year

Due to the timing of my PhD studies, my data collection period, which took place during my second year of study, took place over a calendar year as opposed to an academic one: January to December 2015. Initially I did not conceive of this as an issue. I felt it was important to cover a whole year in order to ‘monitor’ (Swanborn, 2010) activity across all of the potential pressure points of a secondary school year, but that had been my only consideration. However, upon reflection this choice of time period led to greater staff change, for example one of the teachers I interviewed left the school seven months into my data collection while others joined the schools at the start of the new academic year, namely the last four months of my data period. These changes made it more difficult to achieve consistency across the data, particularly when considering questions such as which teachers were the most regular users of SOLE. While such data is not integral to my findings, it did make it more difficult to consider the extent to which some individuals might have dominated SOLE Room use.

4.9 Conclusion

This chapter has described the methodology used to carry out this study. It has demonstrated that the approach taken was consistent with the ontological and epistemological assumptions inherent in my research, as well as with the theoretical framework discussed in the previous chapter. It has also outlined the choices made regarding research design, data collection and data analysis and detailed my rationale for those decisions. I have described the measures taken to ensure that the research complied with appropriate ethical guidelines for safeguarding the participants involved. Finally, I have also explained some of the limitations of the data collected, prior to discussion of the findings arising from that data, which will be presented in the next chapter.

Chapter 5. Findings – SOLE Appropriation and the Object

5.1 Introduction

Due to the volume of findings from the empirical data, they will be presented across two chapters. This chapter will begin with a brief overview of the practicalities of how the SOLE Rooms came to be created in each school, introducing some of the themes that will recur throughout the rest of my findings. Then I will clarify how I understood the schools as activity systems, with some description of each node. The second half of this chapter will explore how the object of each activity system impacted upon SOLE appropriation. I will describe the conflicts that arose from the object in each context and consider the extent to which they were resolved.

5.2 How was SOLE Appropriated in Two English Secondary School Contexts and What Factors Impacted Upon That Appropriation?

5.2.1 Introduction

In this section I will provide an overview of how SOLE was introduced in each school, comparing their approaches. This will focus on practicalities, starting with how the schools became involved with Mitra's 'School in the Cloud' project and considering issues such as where the SOLE Rooms were located and who had responsibility for them. I will also provide an overview of the extent to which SOLE was used in each school, drawing on data from the schools' own booking systems. This section will finish with a discussion of how each school functioned as an activity system during SOLE, with reference to the AT concepts of object, tool, subject, rule, community and division of labour. The implications of decisions made during the introduction of SOLE at each school will be explored in greater detail later in this chapter.

5.2.2 Discovering SOLE

In both schools the headteachers were supportive of teachers experimenting with SOLE before the TED Prize funding became available. At Hillside School, SOLE had initially been brought to the attention of the Community Arts Centre Manager, Emily, after a colleague saw Mitra speak at a conference and thought she would be interested in learning more. In conjunction with the headteacher, Emily then arranged for him to speak to school staff during CPD.

She clearly felt that SOLE reflected the way they worked in the Arts Centre and was interested in developing that further,

“I was interested because ... it fits with the kind of ethos and the principles of the way we work in, particularly, the Arts Centre.” (Emily)

This was during the early stages of Mitra’s SOLE development, when the only research he had conducted was in a primary school, so Emily began working directly with Mitra to try to understand how SOLE might transfer into a secondary school environment. At this stage, SOLEs were happening in the classrooms of the teachers involved and the project was clearly collaborative between Mitra, Emily and the five teachers she was working with in school,

“I had five teachers involved and we Skyped him [Mitra] when he was in Massachusetts and India and various places over that period of time and kept battling back questions – ‘but if we do this and that happens, how would you do that?’ – and he was, we were all in it together I think.” (Emily)

“we [with Teacher 2] were one of the first ones I think to try it and none of this [SOLE Room] existed down here so it was very much a classroom thing that we tried out and then ... I had a Skype session with him [Mitra], we Skyped him as part of that research. And then this room developed from that” (Teacher 9)

There was no apparent sense of hierarchy within this early project, rather the teachers relied on Emily for the link with Mitra and she relied on the teachers to be willing to try SOLE with their classes. However, Emily’s experience at this time seems to have quite strongly influenced her later approach to the management of SOLE within the school. During this early experimentation she clearly came to understand that there was a ‘right’ way to do SOLE, yet the teachers she was working with did not necessarily conform to that. Thus, once the SOLE Room opened, Emily believed it was important to oversee SOLE use to ensure that it was conducted in the way that she perceived would be most effective,

“I mainly delivered the sessions to start with, with the teacher, not so that they copy me entirely but to set the scene because I did notice in that first group [of early experimenters] that some people thought they had the grasp of it and perhaps had the grasp of some of it, but not some of the principles.” (Emily)

In terms of the SOLE Room itself, when Mitra won the TED Prize he contacted Emily and said he would like to work with her and asked if he could use some

of the funding, he received to build a SOLE Room in the school. She was very keen to take up this offer and the headteacher gave permission.

At Longford School, it was the headteacher who first discovered Mitra's work and shared it with both staff and students via assemblies. One teacher was interested in exploring the concept further in a secondary context,

"[I] found out that they hadn't really done it in secondary schools before, so I thought 'well this is an opportunity!' So I came back [from visiting a local primary school that Mitra had worked with] and I had a go and tried a couple of times and then contacted Sugata [Mitra] and said 'you know, I've tried this out in school – what do you think?' and that's how the relationship started." (Teacher S)

No formal collaboration occurred but contact between Teacher S and Mitra was maintained. During this time, a number of teachers in the school were interested enough to try SOLE in their classrooms, facilitating it with reference to the SOLE Toolkit (2014a) and adapting it according to their own experiences. There was no centralised expertise and so no 'right' way to do SOLE, rather a community of teachers supported each other as they developed its use,

"I went up and just tried to find out as much information as possible and did some research on what's involved on it and saw online what was available out there from Sugata [Mitra] himself and from schools that had done that and kind of listened to what [Teacher S] had to say" (Teacher H)

A few teachers were very positive about the potential of SOLE and one redesigned an existing classroom in his department, naming it the SOLE Sanctuary. This classroom was set up to enable SOLE use with a small number of computers, furniture organised to facilitate collaborative working and white boards for groups to write on. However, the room was deliberately designed to be adaptable so that, while it could facilitate SOLE, it could also be used for a range of other classroom activities including independent working. These activities could even be incorporated into SOLE if the teacher deemed it appropriate. Teachers experimenting with SOLE in this way appeared to be supported by the headteacher,

"before we had the official SOLE Room [Teacher H] devised the kind of prototype up there, the 'do it yourself' SOLE Room, which actually is a good, fit for purpose room. It's still used for other things as well, I

suppose it's perhaps still more of a classroom than a SOLE Room."
(Headteacher)

When Mitra won the TED Prize, he contacted the school and asked if they would like to work with him. The headteacher agreed and asked Teacher S to oversee development of the room itself.

In both schools, direct contact with Mitra, an advantage borne out of being located in the north east of England near the university where he was based, led to a key member of staff developing SOLE. In Hillside School this was formalised through a project in collaboration with Mitra, where a small group of staff developed the process together and Emily was the key point of contact. Here, Mitra was consulted regularly which ensured that their interpretation of SOLE was broadly aligned with his. In Longford School, the development of SOLE was more individual, with no one teacher leading the process, and although an informal community evolved, SOLE was interpreted by individual teachers who adapted it as they thought appropriate.

5.2.3 Physical Location of SOLE and Management of the Space

Both schools located their SOLE Rooms in areas associated with creativity. Hillside School had a Community Arts Centre attached which was a separate entity, yet closely linked to the school. The headteacher described the Arts Centre as,

"an outward facing part of the school as opposed to a community centre that's kind of attached on. So therefore, a lot of what's done brings the community into the school and then the school back out into the community," (Headteacher)

The Arts Centre website does not directly link it to the school, except by stating that it can be found in the same location, rather it asserts that they work with a range of schools and networks. However, the school and Arts Centre are physically connected, although staff need their identity cards to get between the two and students need a member of staff to let them in, as well as educationally connected because teachers work with the centre staff to develop creative and innovative teaching practices, of which SOLE is one example. The headteacher explained that the decision about where to place the SOLE Room was a difficult one,

“There was a lot of debate about that and in the end, we felt it was best placed within the Arts Centre, which is a centre for creativity and creative learning and making those links there.” (Headteacher)

Thus, it was agreed that the SOLE Room should not be part of the main school, rather it would be located within the Arts Centre to connect it to the school’s natural home of creativity. One teacher considered the location to be significant in supporting students through SOLE,

“the fact that you bring them down into another area of the school, it sort of signals a, right there’s something different, there’s a bit of a change in what we do and how ... so I don’t know, it’s hard to put your finger on but I would say yeah, it [the SOLE Room] does make quite a dramatic difference really” (Teacher 6)

This emphasises the differences between the main school environment and the corresponding expectations of students and learning that exist there, and the Arts Centre where there was more opportunity for learning in a creative way.

Once the SOLE Room was located in the Arts Centre, control was transferred to Emily as Arts Centre Manager and this was made immediately clear as she managed the creation of the physical environment herself without input from teaching staff. She explained that this was partly a way of controlling the narrative about the room and the information that was available,

“I had a giant artwork that we had commissioned in front of it [the SOLE room, while it was being decorated] so that people were curious and so that people weren’t half seeing things and asking questions that weren’t quite relevant” (Emily)

In effect, from the time when the SOLE Room itself existed, there was no teacher ownership of either the physical environment or the SOLE learning process. In Hillside School, the concept of SOLE as a completely student-led learning strategy was understood to be vital so the room was designed in such a way that teachers did not need to be physically present; it had a row of windows down one side, facing into an area where teachers could sit observing the SOLE without being present in the room, see figure 5.1. Room bookings could only be made by emailing Arts Centre staff to request a session and all big questions had to be submitted and agreed in advance.

“for a teacher that’s the biggest challenge is the question ... I’m sitting down a few days before [a SOLE] and I’m thinking ‘what am I going

to do?!' I'm emailing [Emily] saying 'is this ok, is that ok?' and really that's quite a challenge," (Teacher 7)

All SOLE sessions in this school happened in the SOLE Room itself and there was little suggestion that it could be tried within teachers' classrooms in the main school. The only references teachers made to having conducted SOLEs in their classrooms were in relation to the project with Mitra pre-SOLE Room, and many clearly recognised that the SOLE Room itself was an integral part of the learning experience for students,

"I do think it makes a difference; I think environment's extremely important ... I think they get used to the idea they come in here and they put like almost a different head on their shoulders. And the idea that they are responsible ... you could do it anywhere really but I don't know whether you'd get the same out of it, you'd hope that you would but I think that it makes a difference to how they think and how they respond." (Teacher 6)

"the pupils enjoy coming down here [the SOLE Room], it's a really good space isn't it? And it's just a different sort of environment and so I think that, because they're in the classroom so often, and if you can just change the environment that can actually enhance their learning" (Teacher 2)



Figure 5.1 Hillside School SOLE Room

Note the windows down one side, with sofas for the teacher to sit on and observe while the SOLE session took place. Reproduced with permission from Emily.

Other teachers suggested that SOLE could be used within their own classrooms in theory, but offered different reasons for why they would not do so in practice.

“I think the only thing that is sort of different is you actually remove yourself from the room ... whereas in the classroom, if you walked out and just left them to it ... you can guarantee somebody would have an accident” (Teacher 5)

“I’d have loved to have gone [in response to a student question] ‘you know what, let’s go down to the room and have a look’ ... That would’ve been an ideal opportunity, I mean not even necessarily going down to the special room but just grabbing the iPads ... But it’s like right, no – we’ve got four more things we’ve got to get through” (Teacher 8)

Thus, SOLE was deliberately located in, and associated with, the Arts Centre, as opposed to the main school. However, a significant consequence of this decision was the oversight it afforded Emily. Her role was very different to that of a teacher and, as such, she was able to organise her time to ensure that she was present for the majority of SOLE sessions. This enabled her to simultaneously support teachers with their use of SOLE and influence how they facilitated it.

In Longford School, the SOLE Room was again located in an area of creativity as it was placed in the building which housed the Design department, including Art, Textiles and Product Design. This was the department that Teacher S led so the decision to put the room there was influenced by that practicality, as well as by the availability of a room. The school had one main building, housing a variety of subjects as well as the administrative offices, and three other separate buildings which housed the remaining subject areas. Students moved freely between all of those locations for different lessons. Thus, although the Design Department was in its own building, it was nevertheless still part of the main school system and the usual school rules clearly applied there. The SOLE Room was designed by a group of students, led by Teacher S. Although this room was also designed so that it had windows all down one side, these windows faced outside so it was not practical for teachers to remain outside the room during a SOLE, had they wished to do so; see Figure 5.2.

Although Teacher S was widely recognised as being connected to SOLE, there was no sense that she had a greater degree of control over it than other teachers did. She, or a member of her department, would be asked to support if there were technical problems during a session but there was no apparent deference to her particular interpretation of SOLE. If teachers wanted to use the SOLE Room, they completed an automated online booking form and Teacher S would not be aware of who had booked the room or what they intended to do in there unless she actively checked those records.

Once in the SOLE Room, teachers were entirely left to lead the session as they chose. Teacher S taught a full timetable of lessons so was usually teaching when the SOLE Room was in use and thus was unable to influence how teachers used SOLE in practice; there was no suggestion from any teacher that she might either want, or have the authority, to do so. In addition, a number of teachers at Longford School mentioned that



Figure 5.2 Longford School SOLE Room

they continued to conduct SOLEs in their own classrooms, even once the SOLE Room was open,

"[in] my Year 13 class there's only three students in there, so it seems a bit silly, booking the SOLE Room, for three students who could easily just work on my iPad." (Teacher A)

"it depends on a set of circumstances but from a personal point of view ... I'd have the kids on iPads and I think one of my issues with the SOLE Room is there's only capacity for twenty-four [students] and most of my classes ... have at least that" (Teacher B)

Thus, the room itself was deemed unnecessary for SOLE use, although the majority of teachers who participated in this research expressed a preference for using it, in similar terms to the teachers from Hillside School. It was significant that, if SOLE could legitimately happen anywhere in the school, there was no means by which an individual could particularly influence how it was appropriated. As noted earlier, the headteacher was comfortable with this culture of experimentation and adaptation of SOLE.

5.2.4 SOLE Room Usage

In neither school were teachers forced to try SOLE. Once the rooms were set up training was offered as part of CPD, but if teachers were not inclined to try it they were not obligated to do so. All the data given in this section was taken directly from the SOLE Room booking records kept by each school. Please note that these were only records of room bookings, they do not confirm whether the sessions went ahead or account for any SOLE sessions that might have been conducted without formally booking the rooms.

- **Hillside School**

The SOLE Room was opened at Hillside School in February 2014. During my data collection period, which largely took place throughout 2015, the room was booked for use on forty-two separate occasions, as shown in table 5.1. The quietest half term of use was from the May half term holiday to the summer holiday when there was no record of the SOLE Room being booked at all, although this coincided with the school merging with another local secondary school, a time of significant upheaval, and thus is likely to be anomalous. The half term when the room was booked most often was from the February half term holiday to the Easter holiday, at which time the room was booked for an average of three SOLE sessions each week, out of a

possible thirty sessions. Thirteen of the forty-two bookings were made for primary school groups or for the Time for Success enrichment program which was a tutor led session. The Headteacher described this as,

“a vertical tutoring session, so it’s a daily lesson that we have ... there’s a range of various interventions and support, but on two sessions they follow an enquiry. They have an enquiry question and that’s the focus of the young people working, across the different ages, so it’s quite natural that people might take that question into the SOLE Room to explore it using SOLEs as a mechanism.” (Headteacher)

The school had a vertical tutoring system, therefore Time for Success classes consisted of students from all year groups and are allocated as ‘mixed’ in table 5.1. The remaining SOLEs were booked for single year group classes, by subject teachers. Most SOLEs were booked for use with Years 7 and 10 classes and no sessions were booked for Year 11, the year group who were due to sit high stakes tests.

Humanities teachers were the most frequent users of the SOLE Room at Hillside School, although History teachers did not use SOLE at all during 2015. The Visual Art department were the second most frequent users, together with Time for Success, a

	Jan to Feb half term	Feb half term to Easter	Easter to May	May to Summer	Sept to Oct half term	Oct half term to Christmas	TOTAL
YEAR 7	1	4	3	0	0	1	9
YEAR 8	1	3	0	0	0	0	4
YEAR 9	0	4	1	0	0	0	5
YEAR 10	3	3	1	0	1	1	9
YEAR 11	0	0	0	0	0	0	0
YEARS 12 / 13							
MIXED AGES	1	1	1	0	2	0	5
PRIMARY VISITS	0	0	7	0	1	0	8
UNSPECIFIED	0	0	2	0	0	0	2
TOTAL	6	15	15	0	4	2	42

Table 5.1 Hillside School SOLE Room bookings by year group

programme delivered daily to vertical tutor groups in forty minute sessions. Visual Arts were the only department in which every teacher tried SOLE during the data collection period. Most department areas were represented in the SOLE Room on at least one occasion, though it is clear that SOLE use was sporadic. There were three curriculum areas from which teachers did not book the SOLE Room at all during my data collection, these were Modern Foreign Languages, Physical Education and Information Technology. Although data collection took place during 2015, the usage level appeared to

remain consistent in 2016 as twenty sessions were booked from January to Easter, exactly the same number as took place in that same period the previous year. However, where fifteen of the twenty sessions in 2015 were with secondary school children in specific subjects, only seven of the 2016 sessions were booked for the same and the other thirteen were for Time for Success or with primary groups, representing a significant increase in the number of sessions for non-subject specific SOLEs. See Table 5.2 for an overview of SOLE Room bookings by subject.

	Jan to Feb half term	Feb half term to Easter	Easter to May	May to Summer	Sept to Oct half term	Oct half term to Christmas	TOTAL
Maths			2		1	1	4
English / P Arts	2						2
Science		1					1
Humanities (H, G, RE)	3	5	2				10
MFL							0
DT / Art / Food		4	3			1	8
PE							0
IT							0
T4S	1	4	1		2		8
TOTAL	6	14	8	0	3	2	33
		Nurture Group 1	Primary 7		Primary 1		42

Table 5.2 Hillside School SOLE Room bookings by subject

Fifteen different teachers, less than a quarter of the teaching staff, booked to use the SOLE room during 2015 and, of those, six teachers only booked the room once. The most prolific user of the SOLE Room during this time was Emily who booked the room on eight of the forty-two occasions, usually for SOLEs with local primary school children. The next most significant user was a Geography teacher (Teacher 7) who booked to use the room five times during this period; this teacher was a member of a CPD group with a focus on SOLE. However, the data being collected over a calendar year, as opposed to an academic year, affected the data as teaching staff tend to change jobs in September rather than January. For example, Teacher 7 left Hillside School in July 2015. No other teachers appeared to use SOLE with any regularity and only one Head of Department booked to use the SOLE Room during this time. See table 5.3 for an overview of SOLE Room bookings by teacher at Hillside School.

	1 (HoD)	2	3	4	5	6	7	8	9	10	TOTAL
Maths	3	1									4
English / Perf Arts		1	1								2
Science		1									1
History											0
Geography		5									5
RE		2	3								5
MFL											0
DT / Art / Food		3	3	2	ALL VISUAL ARTS DEPT MEMBERS USED SOLE						8
PE											0
IT											0
T4S		1	4	1	1	1					8
TOTAL											33
Sole Room Coordinator											8

*Table 5.3 Hillside School SOLE Room bookings by teacher
Note that Science Teacher 2 is also Time for Success Teacher 2 (total 2 SOLEs)*

- **Longford School**

At Longford School, the SOLE Room was opened in October 2013. During my data collection period the room was booked for use on 191 separate occasions, see table 5.4 for an overview of room bookings by year group. However as noted earlier, Teacher H had created his own SOLE space which had no formal booking system, therefore the data given here does not include any SOLE sessions that took place in that alternative room. The quietest half term of use was between the February half term holiday and the Easter holiday when the room was booked an average of three times a week, out of a possible twenty-nine sessions. The half term when the room was booked most often was between the May half term holiday and the summer holiday when it was booked for

	Jan to Feb half term	Feb half term to Easter	Easter to May	May to Summer	Sept to Oct half term	Oct half term to Christmas	TOTAL
YEAR 7	3	5	10	5	13	10	46
YEAR 8	4		9	16	15	1	45
YEAR 9	3	1	4	6	1	8	23
YEAR 10	7	3	4	2	1	1	18
YEAR 11	1	1					2
YEARS 12 / 13				10	1	1	12
MIXED				1			1
PRIMARY VISITS					1		1
UNSPECIFIED	8	8	3	16	4	4	43
TOTAL	26	18	30	56	36	25	191
ITT Student Use			12		1	2	15

Table 5.4 Longford School SOLE Room bookings by year group

an average of eight SOLE sessions per week. Interestingly this was just prior to the summer holidays when high stakes testing had finished and thus much of the work of a secondary school might be considered to be done. This could imply that SOLE was seen as more of an enrichment activity than an activity

to support the daily learning that took place, although it may also reflect the fact that SOLE was relatively new and teachers were experimenting with how best to use it at a time when they felt under less pressure. The number of SOLEs in the new school year, particularly from September to the October half term holiday, remained quite high. This was partly because some departments had begun to include SOLE across their schemes of work from September 2015, for example most Year 8 Geography classes used the room twice in that first half term. While there were occasional SOLEs with primary or non-subject specific groups, the majority were undertaken by class teachers to teach their usual subjects. Almost half of all SOLE sessions, ninety-one of 191, took place with Years 7 and 8 and a further twenty-three sessions with Year 9. Thus, the majority of SOLEs were undertaken with Key Stage 3 students, who were not yet studying content for high stakes tests, although a high number of the sessions booked did not specify which year group took part (forty-three). Given the exceedingly small number of sessions booked with Year 11 students, just two across the data collection period, it does seem fair to suggest that, the higher the students progressed through school and thus the closer they got to high stakes testing, the less likely teachers were to use SOLE with them. This was true until they reached Years 12 and 13 where some teachers appeared to reintroduce SOLE.

Humanities teachers were the most frequent users of the SOLE Room at Longford School, with almost a third of all SOLEs occurring within those subjects. Every member of those departments booked the SOLE Room and most used it more than once. This reflected the fact that all three of the Humanities subjects had embedded SOLE within their curriculum to some degree: Geography and RE teachers aimed to use SOLE once in every unit taught to Years 8 and 9 (Year 7 did not have discrete Humanities lessons). History teachers used SOLE more infrequently for selected topics, for example during a unit based around conspiracy theories. Maths teachers were the second most frequent users of SOLE, although this is partly explained by the fact that half of all the Maths SOLEs were taken by one teacher. PE teachers did not book the room at all. The Health and Social Care department, which included Food Studies, had their own SOLE Room within the department and teacher interviews suggested that there were regular

SOLEs happening, but no records were kept for that room. It is interesting that, with the exception of PE, every curriculum area booked the SOLE Room on a number of occasions. This data collection took place in 2015, more than a year after the SOLE Room opened, however SOLE use appeared to have gained some momentum as seventy-seven sessions were booked from January to the Easter holiday in 2016 which represented a significant increase on the forty-four SOLEs booked in the same time period in 2015. The pattern of subjects remained similar in 2016. See Table 5.5 for an overview of SOLE Room bookings by subject.

	Jan to Feb half term	Feb half term to Easter	Easter to May	May to Summer	Sept to Oct half term	Oct half term to Christmas	TOTAL
Maths	4	4	5	2	8	7	30
English / Perf Arts	4		1	2	1	1	9
Science	3	2	4	1			10
Humanities (H, G, RE)	10	7	1	21	14	10	63
MFL	1		2	4			7
DT / Art	1	1	1	1	4		8
Psych / Soc			2	3	1	1	7
H&S / Food	3			12			15
PE							0
Business / IT		4					4
iLearn			2	2	4	4	12
Applied Studies				7			7
TOTAL	26	18	18	55	32	23	172
			ITT 12	SEN 1	ITT 3, Primary 1	ITT 2	191

Table 5.5 Longford School SOLE Room bookings by subject

Approximately half the teaching staff, forty teachers, booked to use the SOLE room during this data collection period. Some teachers appeared to use it regularly, though that was clearly not the norm, and those who did book the room with some regularity tended to focus on particular year groups, usually Years 7 and 8. Sixteen teachers only booked to use the room once. The most prolific user of the SOLE Room during this time was a Maths teacher who took one Year 7 class to the room every week for a term and who also used the room with her iLearn class; she booked the room nineteen times. However, the fact that data was collected during a calendar year affects the findings, for example, the Maths teacher mentioned above only joined the school in September 2015 so, despite the fact that she had the most SOLE uses throughout this period, she was only at the school for one of the three terms during which data was gathered. See table 5.6 for an overview of SOLE Room booking by teacher at Longford School.

	1 (HoD)	2	3	4	5	6	7	8	9	10	TOTAL
Maths	1	4	2	15	1	1	2	3	1		30
English / Perf Arts		3	1	4	1						9
Science	1	4	3	1	1						10
History	1	3	9	4	ALL DEPT MEMBERS USED SOLE						17
Geography	12	6	4	8	9	ALL DEPT MEMBERS USED SOLE					39
RE	6	1	ALL DEPT MEMBERS USED SOLE								7
MFL		1	4	2							7
DT / Art	7	1									8
Psych / Soc	6	1									7
H&S / Food		15									15
PE											0
Business / IT	4										4
iLearn		2	4	1	1	4					12
Applied Studies	7										7
TOTAL											172

Table 5.6 Longford School SOLE room usage by teachers

Note that Maths Teacher 4 is also iLearn Teacher 3 (total 19 SOLEs); Geography Teacher 2 is also iLearn Teacher 6 (total 10 SOLEs); Geography Teacher 4 is also iLearn Teacher 1 (total 8 SOLEs); English Teacher 4 is also Psych / Soc Teacher 2 (total 5 SOLEs); RE Teacher 1 is also Psych / Soc Teacher 1 (total 12 SOLEs).

Overall, there were significantly more SOLE Room bookings at Longford School than Hillside School during my data collection. Although Longford School was slightly larger, this does not sufficiently explain the extent of the discrepancy. In addition, there were more subject areas which appeared to use SOLE with some regularity at Longford School, as well as a slightly greater number of departments in which every teacher had used SOLE, typically more than once. Both schools appeared to have a number of teachers who made regular use of SOLE, though this was certainly not the norm and most SOLE use appeared sporadic across both schools. Hillside School offered students a wider range of SOLE opportunities than Longford School, with a significant number of SOLEs incorporating mixed age groups through Time for Success lessons, or with primary school children. In Longford School almost every SOLE was undertaken with a single age class and focused on the content of a specific subject.

5.3 The Schools as Activity Systems

Having considered the practicalities of how SOLE was introduced in each school, I will now briefly describe each context in terms of an activity system. Clarification of how I have understood those systems in relation to each case will be useful in the following sections, where particular components of the activity systems will be considered in detail. For each school, I will explain

the activity system specifically as it related to SOLE use, where SOLE is the tool within an activity best understood with reference to the object of educating students, as justified in Chapter 3.

5.3.1 Hillside School: The Activity System

At Hillside School, there were two neighbouring activity systems involved in the provision of SOLE. The first was the activity system within which the school was contained, as defined by the object of educating students, specifically to pass high stakes tests. This can be understood with SOLE as the tool, the teacher as the subject, the rules as the usual school rules and a teacher's NDS, together with rules about subject content as dictated by the curriculum or exam syllabus, the community comprising the students and Arts Centre staff and the division of labour representing the usual strong framing with teacher accountability; this has been depicted in figure 5.3. The object of this activity system did not change during SOLE, although teachers' motives expanded to include providing students with the opportunity to learn more independently, as well as preparing them for high stakes tests.

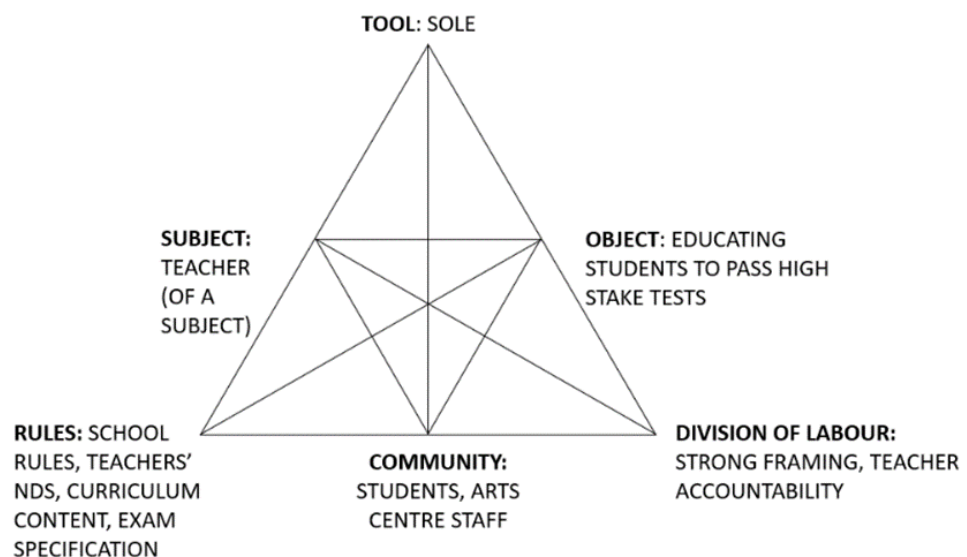


Figure 5.3 Hillside School Activity System During SOLE

The second activity system involved in SOLE provision was that of the Arts Centre itself. This was a separate activity system because it had a separate object relating to promoting creativity. This activity system can be understood with SOLE as a tool, Emily as the subject, the rules corresponding to the SOLE rules with an additional rule that teachers must stay outside the

SOLE Room, the community comprising the students and the teacher and the division of labour manifesting as Emily having ultimate control, which she redistributed to the students; this has been depicted in figure 5.4.

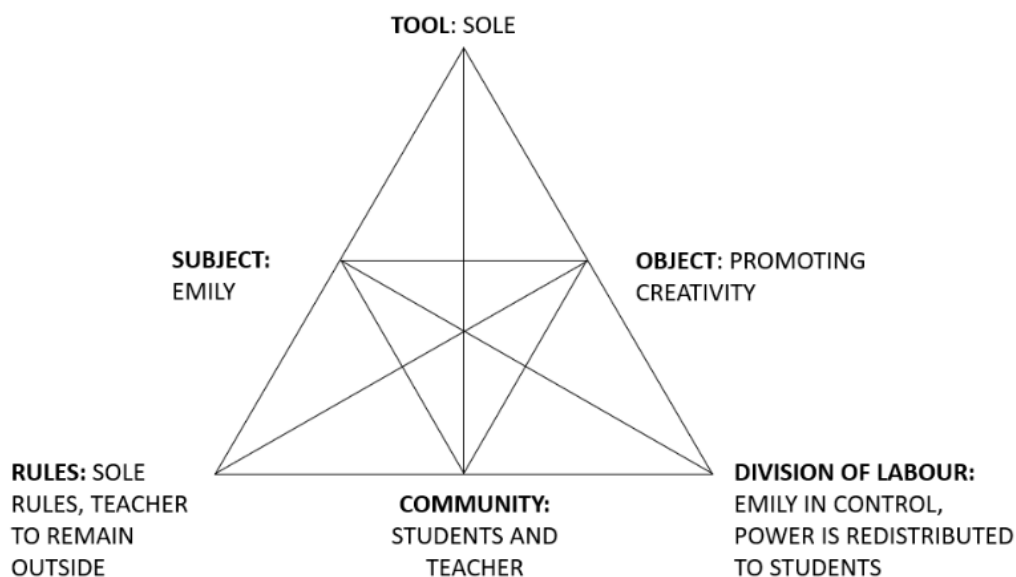


Figure 5.4 Arts Centre Activity System During SOLE

These neighbouring activity systems centred around a shared object which was concerned with changing teacher practice. This shared object emerged from the interaction of the two systems but in practice very few people perceived it; figure 5.5 shows the interaction of these neighbouring activity systems.

As this brief overview suggests, there was the potential for much conflict between these neighbouring systems because some nodes of activity were so different in each. In particular, the teacher became almost invisible in the Arts Centre activity system and there was a significant shift in power towards the students. The fact that SOLE occurred at the intersection of these neighbouring systems clearly impacted upon its appropriation.

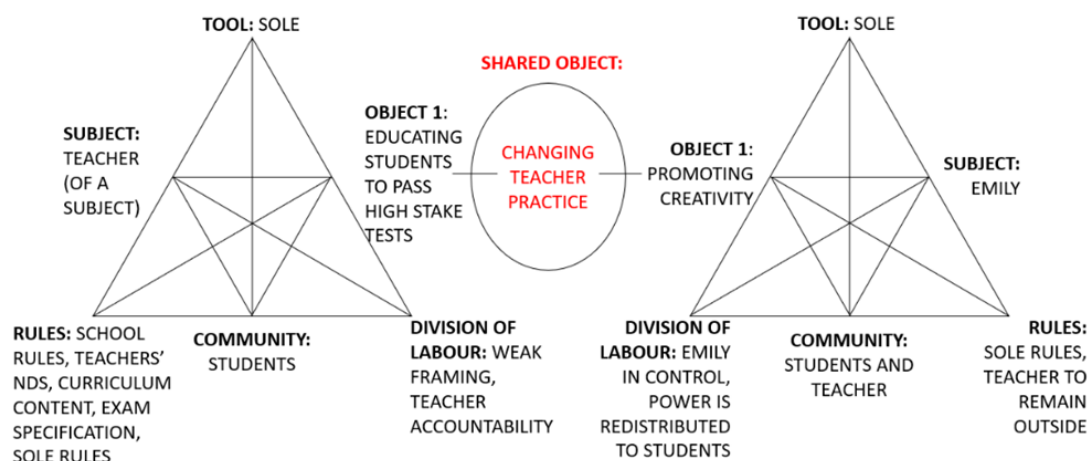


Figure 5.5 Neighbouring Activity Systems Interacting Around a Shared Object

5.3.2 Longford School: The Activity System

At Longford School SOLE was conducted within the wider educational activity system. Therefore, the object of the system remained constant, specifically educating students to pass high stakes tests. Despite this, teachers' motives appeared to change when SOLE was used, with a focus on providing students with wider educational opportunities, particularly in terms of learning more independently, becoming more dominant. As SOLE occurred within the usual parameters of the education system, the components of that activity did not significantly change, rather they expanded to incorporate elements of SOLE. During SOLE at Longford School, the activity system can be understood with SOLE as the tool, the teacher (of a particular subject) as the subject, the rules consisting of the usual school rules and teacher's NDS weakened by the introduction of elements of the SOLE rules, the students as the community and the division of labour demonstrating weaker framing than usual but with ultimate teacher accountability; this has been depicted in figure 5.6.

5.3.3 Cross-case Comparison of Activity Systems

It is clear that the activity systems in each case manifested very differently. At Hillside School, the decision to locate the SOLE Room outside of the school itself resulted in it becoming part of a separate activity system, one with a different object. This meant that SOLE use occurred at the intersection of two neighbouring activity systems which

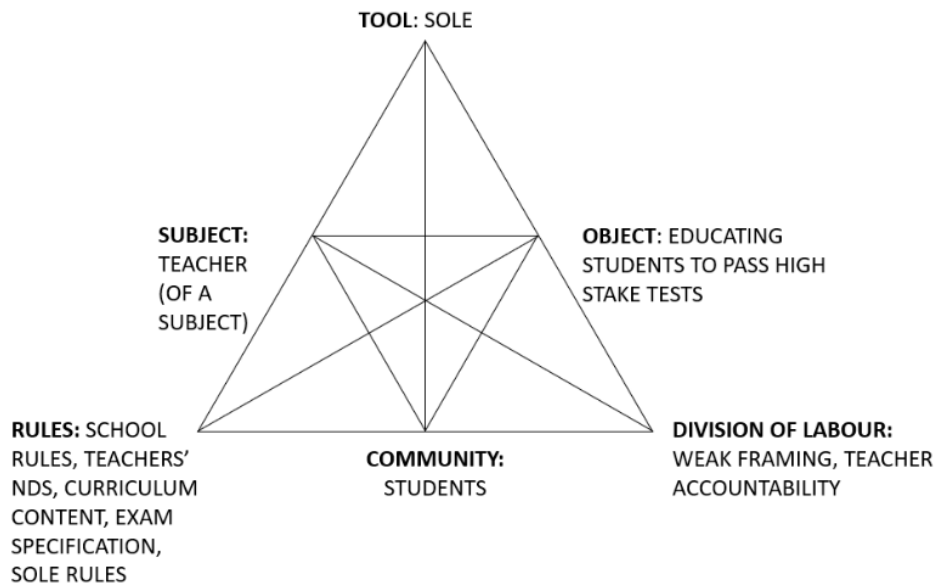


Figure 5.6 Longford School Activity System During SOLE

significantly impacted upon appropriation. At Longford School, SOLE was appropriated within the education activity system which meant that the object remained the same. This impacted upon the way in which the SOLE rules and division of labour were implemented, ultimately resulting in an amalgamation with the rules and division of labour as they typically manifested in that system. This had a significant impact on SOLE appropriation because it inevitably made it less uniform as teachers adapted it within their usual NDS.

5.3.4 Conclusion

In this section I have compared the practicalities of how SOLE was introduced in each school. I have discussed some of the key differences between the two approaches, particularly emphasising that the decision to locate the SOLE Room in the Arts Centre at Hillside School had important implications in terms of both the object and the division of labour during SOLE. This contrasted with Longford School where SOLE was introduced into the education activity system and where control of implementation devolved to teachers, which impacted upon the extent to which they adhered to Mitra's SOLE ideal. In the remainder of this chapter the impact of these early decisions will be explored, with particular reference to the object that manifested during SOLE use at each school.

5.4 What Was the Object of the Activity System During SOLE and What Impact Did This Have on Appropriation?

5.4.1 Introduction

This section will provide empirical data to answer the second of my research questions,

“What was the object of the activity system during SOLE and what impact did this have on appropriation? What contradictions were apparent and (how) were they resolved?”

I will consider the object of the activity systems at each school with particular reference to the outcomes that teachers required from SOLE, deriving from the object. I will also explore some of the contradictions arising from the object of the activity system and the way that these impacted on SOLE appropriation. The schools will be discussed separately to ensure in depth analysis of each case but the section will conclude with a comparative summary of the schools and the issues arising from how the object impacted upon SOLE appropriation in each.

5.4.2 Hillside School: Object of the Activity System

At Hillside School there were two neighbouring activity systems involved in the provision of SOLE, please refer back to figure 5.5 (p.96) for a graphical representation. The first was the school system, where the decision to use SOLE was initially made by a teacher and from where the students came to participate in SOLE. The second was the Arts Centre, where the SOLE sessions actually took place. The object of this activity system was distinct from that of the school activity system and thus a shared object for SOLE arose between the school and the Arts Centre activity systems. This created conflict for teachers and students.

- ***Object of the Arts Centre Activity System***

The object of the Arts Centre activity system as a whole appeared to be to provide opportunities for creativity within the surrounding community, including the neighbouring school. However, as the Arts Centre was not the focus of this research, and it only became clear that there were two distinct

activity systems once data collection had finished and analysis was underway, no data was collected specifically to support or refute this. Thus, it is necessary to focus solely on the shared object between the Arts Centre activity system and the school activity system, as it emerged during SOLE. This was concerned with changing teaching practice in the school,

“actually, it’s the underlying way that it [SOLE] shifts teaching and learning that I’m excited by. One of the most powerful things I think it has done here is challenged teacher’s perceptions and encouraged them to question some of their assumptions and consider their role [I: So the biggest impact that SOLE could have might not be evident in the SOLE Room necessarily, it might be changes to practice that people take back?] I hope so, otherwise what’s the point?! Not entirely what’s the point because it’s useful in itself, but I think that’s a more powerful thing: that it shifts things, it encourages curious learners that feel able to learn and want to learn and have a desire to learn because the environments allowing it and because the adult’s facilitating it rather than just providing it and then asking it to be regurgitated back.”
(Emily)

Thus, the shared object between the two systems was to influence practice in classrooms by impacting on the normative rules and division of labour that existed there. It was this object that determined the division of labour during SOLE, taking power away from teachers and excluding them from co-creation of the rules. SOLE was predominantly intended to be a tool for shifting teacher perceptions and behaviour on a much broader scale and, as such, Emily believed that they needed to experience a very particular form of SOLE in order to first recognise and later replicate those behaviours themselves. Thus, SOLE use had been deliberately planned to create conflict for teachers with the intention of impacting upon their wider practice.

Prior to the SOLE Room, Emily had been a regular presence in the school activity system, supporting the development of creative learning strategies which aimed to facilitate more independent learning,

“Before the room came [Emily’s] role has always involved the promotion of creative and innovative approaches to learning” (Headteacher)

It was not, therefore, unusual for her to attempt to influence teacher behaviour or to promote particular types of teaching and learning strategies within the school activity system. The authority that she had within the school was bestowed by the headteacher and she was only able to actively work towards such an object with his support. They appeared to be in agreement about the object of SOLE within the Arts Centre,

“it [SOLE] sort of fitted into the journey that we were on where we wanted to challenge maybe some of that more didactic, traditional teaching. We were taking the school on a school improvement journey and people felt that playing safe would get the results and actually we were saying not ... In the first year we actually had weekly review meetings with senior staff about how it was going so that we were sure that it was a priority and it was being embedded and it was making a difference, not just a bolt on: it was about making a difference to our teaching and learning. [I: So beyond just the SOLE Room, going back into the classrooms?] Yes.” (Headteacher)

It was clear that both Emily and the headteacher shared a much wider vision for SOLE than simply using it as an alternative method for engaging with subject content. They were committed to using it as a means of shifting teacher behaviour and consequently intended to change the learning experience of the students in the adjacent school activity system.

- ***Changing Teacher Practice: An Invisible Object?***

Interestingly, although both Emily and the headteacher appeared fully committed to using SOLE as a vehicle for transformation, this shared object does not seem to have been articulated to the teachers themselves. No teachers, either in interviews or during observations, suggested that SOLE was intended to change their wider practice and nor did they imply that such change was necessary or desirable. Indeed, when they reflected on SOLE, they seemed to perceive of it as a self-contained entity which would need to be transferred into the classroom in its entirety. Some teachers did discuss the possibility of doing this but they envisaged it as a replication of what happened in the SOLE Room, rather than unpicking the principles behind the process and weaving them into their usual classroom practice,

"I think the natural progression is that this [SOLE] happens in your classroom – I don't know if that's what the ultimate aims are or not, I don't know" (Teacher 7)

"in the classroom, if you walked out and just left them to it, you know, you can guarantee somebody would have an accident ... Whereas they're still slightly, they know that they're supervised [in the SOLE Room]" (Teacher 5)

These teachers both understood SOLE as a self-contained entity which should be replicated faithfully. Teacher 7 suggested that the whole process should happen in classrooms and articulated that the shared object was unknown to teachers, while Teacher 5 clearly believed that she would have to remove herself from the classroom in order to conduct a SOLE there. Teachers not being present in the SOLE Room was such a defining characteristic of SOLE at Hillside School that it was difficult for them to consider transferring it into their own classrooms. When teachers did reflect upon this, they typically felt that it was not possible,

"if I was doing that [SOLE] in my classroom, just with the sort of constraints of space, I haven't really set that up in a way where you can suddenly change your mind part way through in the way that you can here, it tends to be ... more teacher driven, you know 'right we'll work together but you lot are working together and you're doing this and you're maybe looking at this and you're looking at that' and it's more teacher-directed." (Teacher 6)

Even where a teacher noted that he had the resources to replicate a SOLE in his classroom, he described how he limited the parameters of that learning experience and essentially made it into a research task,

"I've got a set of computers in my room so I can set tasks ... they [students] don't necessarily go as wide afield as you would in here [SOLE Room], probably because I'm more prescriptive. I don't necessarily set the same sort of questions, it's more, 'research about a volcano' so I'm automatically directing them towards that" (Teacher 7)

Thus, it seems that teachers at Hillside School found it difficult to consider adapting SOLE to a classroom setting and there was no suggestion that the wider principles behind it could be applied to any other learning format. Thus, the very specific way that SOLE was appropriated at Hillside School

arguably made it more difficult for them to work towards the shared object. In addition, because this was essentially an invisible object to all but Emily and the headteacher, there were no opportunities for wider discussion with teachers about how it might be achieved.

- ***Object of SOLE for Teachers***

During SOLE, it was clear that teachers retained the object of the school activity system, specifically educating students by preparing them to pass high stakes tests. This is likely to reflect a lack of teacher awareness that SOLEs occurred in a neighbouring system given that they were not aware that the object of the activity had changed, and it is the object which defines an activity. It was evident that the object for teachers was consistent with that of the school activity system because the outcomes they wanted from SOLE centred around students learning relevant subject content in a timely manner, which supported preparing them for high stakes tests,

“I think my success criteria in my head is how quickly the learning’s moved on in the particular thing that I’m trying to address. So why I feel this last one’s been really successful is I feel like we’ve moved really quickly to quite a comfortable place in our learning ... more quickly than perhaps we would have if I’d have gone through these quite traditional steps.” (Teacher 6)

“I think obviously the key is what they find out, and hopefully they find out something that they didn’t know” (Teacher 7)

“Teacher explains that she’s unconvinced by SOLE at present as she’s unsure about how much they actually learn.” (Observation D)

The object therefore generated a motive for teachers to use SOLE that consisted of students learning specific subject content. As this was the main outcome that teachers required from SOLE, it was also how they evaluated whether a particular session had been successful or not. However, an additional motive for some teachers also appeared to be the unique opportunity SOLE provided to enrich their subject, even where the content covered was limited,

"I could've definitely got through more Maths in an hour in a classroom, however I felt like they got so much more out of it than that, that will be so useful in terms of the broader education and it didn't impede the learning of the Maths, I just felt it enriched it so much" (Teacher 6)

"it was just interesting to sort of see how ... [SOLE made] Maths a bit more relevant to them by going in there and investigating and they absolutely loved doing it I have to say." (Teacher 5)

Here, Teacher 6 noted that the SOLE did not "impede" Maths learning, indicating that she had not disregarded the object, however she appreciated the opportunity for students to gain a wider understanding of her subject. This suggests that she experienced conflict in the dominant activity arising from an object that focused on such a narrow definition of educating students and that SOLE provided some resolution to that conflict. Similarly, the opportunity for students to experience an alternative kind of learning which encouraged them to be more independent was also cited as a significant motivator by the majority of teachers,

"they [students] expect instant help [in a classroom] and you know, some of them can be very needy in that way, but I think it's [SOLE] a way of saying 'well ok you're going to have no teachers there to help you, you've got to use what's here' ... and it is helping them to research themselves I think, so that's quite good to make them a bit more independent." (Teacher 5)

"the fact it's independent ... I think it's good that now, at this age, we try to develop those [skills] because there is more being independent in college than there is here." (Teacher 9)

"I think the learning's about the discipline of working unsupervised and working as a team unsupervised and having a resource, the Internet, I mean it's a massive thing and a lot of their focus is quite narrow; give them a question they'll type that question into Google and then that's what they get, like a couple of pages and that's what they'll do, they don't necessarily think out of the box. But I think that's something that you would have to do over a period of time, so I don't think it's necessarily about what the outcomes are at the end, it's how they work together, what they produce and the skills, they get a lot of skills through that," (Teacher 7)

Interestingly the focus was purely on student behaviour changing, not their own, which demonstrates that the shared object was not recognised by

teachers. Nevertheless, teachers were clearly enthusiastic about the wider learning opportunity that SOLE provided and it was possible that SOLE use resolved a conflict for teachers between the object of the school activity system, which they felt limited learning to acquiring subject content to pass high stakes tests, and their beliefs about what education should provide. SOLE offered a headteacher-sanctioned, thus relatively risk-free, solution to any teachers who found the education object too restrictive. The opportunity for students to learn more independently appeared to be a key reason why teachers chose to use SOLE at any particular time. However, there was no apparent consideration of how students might become more independent, beyond simply giving them the opportunity to participate in a SOLE, or of how students could be supported in developing new learning behaviours; these outcomes were understood to be by-products of participating in a SOLE. Had teachers been aware of the shared object for SOLE, they may have considered how they could use some of the principles to develop student independence in their own classrooms. However, the formulaic way that teachers understood SOLE at Hillside School made it difficult for them to recognise how they might take elements of the process and adapt them for classroom use. This, coupled with the pressure to work towards the object of the school activity system, made it very difficult for the shared object to be realised.

To summarise, at Hillside School there were three objects: one in the education activity system, one in the Arts Centre activity system and a shared object between the two. Teachers were motivated to use SOLE as a vehicle for providing students with a more independent learning experience, as well as by the opportunity for them to engage with specific subject content, an outcome that supported the object of the education activity system. These dual motives created conflict for teachers, which will be discussed later in this section.

- ***Student Perceptions of the Outcomes Required From SOLE***

The outcomes that teachers wanted from SOLE regarding gaining specific subject content and developing student independence were never explicitly

shared with students. Indeed, there was never any real attempt to discuss with students what they might gain from a SOLE session that differed to what they might gain from more traditional lessons. Therefore, it seems reasonable to assume that students carried their usual expectations into SOLE sessions because it was essentially just another lesson for them. In the observations undertaken, students seemed to perceive the desired outcome to be that they produced some information by the end of the session. This resulted in low level learning outcomes in every SOLE observed because the quality of this information, and the extent to which they had engaged with it or understood it, did not appear important.

"[In reference to student presentations:] Groups all gave very similar answers, mostly from the same website it seemed. A fair bit of copy and paste." (Observation A)

"There is more information on their slides which they have copied and pasted." (Observation E)

"[Students] want to make a PowerPoint; copying and pasting as well, there can be a lot of that going on. So sometimes in feedback I'll ask 'Can you explain what that word means? Do you know what that word means?' and they haven't a clue." (Teacher 9)

Students appeared to understand the acceptable outcome of a SOLE session to be the production of a document with information on it, certainly this was what students did in every SOLE observed. They did not appear to distinguish between producing some 'work' and actually engaging with information in a way that might promote learning,

"[SOLE Question: What makes us human?] When pushed [during debrief] to say what makes us human they were unsure. This process was repeated with other groups. One talked about evolution but couldn't answer a question about why evolution happens." (Observation E)

"A student comes out to say that because their computer turned off, they don't have anything to present. When the teacher asks what they had on their Word document they say 'the title'. They had been looking at one page the whole session, in between YouTube. Don't seem to have taken in what they're looking at." (Observation D)

The fact that students could nominally be engaging in the SOLE process, yet were unable to talk about anything they had learned unless they were reading from information they had recorded, suggested that they considered the production of something tangible (written), that would act as evidence of the session, to be the desired outcome. In the SOLEs observed, when students presented their findings, they often shared information that appeared to have been copied and pasted, and teacher interviews confirmed this, for example Teacher 9. Students appeared to be content with 'an' answer, regardless of whether they understood it or believed it to be accurate.

However, this experience was not quite universal. Teacher 6 discussed some SOLE sessions which she felt had gone particularly well, and she justified this with the depth of student understanding,

"I thought 'right, I'll get them to investigate the idea of Pythagoras, what he did, what he was famous for, why he's still interesting,' and then thought 'well I'll probably still have to teach how to apply [it]', but I didn't ... they did some posters, feedback and I said 'oh well you need a worked example' and they just worked it out, they've just done it."
(Teacher 6)

In this instance, the teacher felt as though students had really understood the concepts that she had intended them to cover and thus she was able to move their learning on more quickly. Interestingly, the teacher had used this same SOLE question with three groups of students, with differing results,

"the Pythagoras one I've used three times now. Interestingly enough, same question, twice really successfully, once, total damp squib ... I don't know whether that's the dynamic within the group. But as I say, I have used it three times: first time really successfully, second time, no we didn't really get anywhere with it, we fuffed about, and this time I was really pleased." (Teacher 6)

Interestingly, Teacher 6 is particularly satisfied with the outcomes from two of the SOLEs because students made such rapid progress towards the outcomes required by the object, and they did so while acting completely independently. This was the only example, at Hillside School, of a teacher who appeared to have satisfied both motives in one SOLE session; for most

teachers, the two appeared incompatible. Yet, even with the same question and the same teacher, the learning itself varied between groups of students and Teacher 6 described other SOLE sessions which she deemed less effective (in working towards the object). No other teacher at Hillside School, either during interviews or observations, gave examples of learning that they considered to have been so successful. Only Emily spoke in similarly positive terms about the outcomes of SOLE sessions. For other teachers who had used SOLE, the best outcome appeared to be students finding any new content, whether or not they understood it or it was copied and pasted.

- ***SOLE Debrief: Reinforcing Limited Outcomes?***

The SOLE debrief was an opportunity for teachers to measure how effectively SOLE might satisfy their motives, particularly regarding the object, by evaluating the learning outcomes. It also provided an opportunity for teachers to adjust student perceptions of the outcomes that were required by challenging any they considered disappointing. For example, where students had copied and pasted information, teachers could make clear that this was not desirable. However, in practice the debriefs followed a present and praise format whereby students shared the information they had found during the SOLE session and teachers praised their efforts,

"[SOLE Question: Why do we remember the Battle of the Somme 100 years later?] Group 1: bloodiest battle in history. Gives statistics about injured / killed. Cover supervisor, 'So you think that because it was so bloody it was important?' Students, 'Yeah.' Cover supervisor, 'Excellent, well done. Anything else?' ... Teacher then comes back into the room and students quieten down. She asks for one answer to the question and a student volunteers that "We wouldn't be here without them." Teacher describes this as a "strong answer." (Observation F)

This present and praise approach ultimately served to reinforce students' belief that producing some information by the end of the SOLE was the intended outcome. Indeed, it would seem to suggest that this was also the outcome that teachers wanted from SOLE. During observations, all student answers were praised and, even where teachers made it clear that one presentation was better than others, this tended to reflect the amount of information that students had acquired, rather than its quality or the extent to which students actually understood it,

"[SOLE Question: What are statistics and are they always true?] Group 4: they ask if they can stand at the front and present. Permission given. They give a presentation with some general information about statistics. Teacher encourages a round of applause at the end." (Observation G)

The students gave a longer presentation than other groups and were enthusiastic enough to stand at the front of the room, but their answer was still generic and arguably reflected little depth of learning or understanding. Nevertheless, they were the only group to be rewarded with a round of applause, which implied a high – quality outcome. This positive reinforcement would probably not have been sufficient to impact upon the behaviours of the rest of the class because the teacher never articulated what it was that they had done better, and every group had been praised for the answers they gave,

"Group 1: student gives a definition and teacher praises ... Group 2: give an alternative definition of statistics. Praise." (Observation G)

Where all groups have received praise, they are unlikely to be cognisant of a need to do anything different in future. The present and praise format also appeared to prevent teachers from challenging students to develop their answers further, or from encouraging them to challenge each other where their answers differed. For example, in the extract given above, consecutive groups provided different definitions of statistics, but they were not asked to consider why there might be more than one definition, whether both were accurate, whether they might have different purposes or to reflect on where they found their information and if their sources were equally reliable. This acceptance of answers at face value, resulting in missed opportunities to deepen understanding, was common,

"[SOLE Question: What do Aborigines believe came first, man or beast? What do they believe about how the world was created?] Feedback: all groups apart from one found that the beast came first. This is not pursued by cover supervisor. A student asks that one group where they got their information from, saying 'If it's Wikipedia you can't trust it, anyone can make changes to that.' This is not followed up by cover supervisor either. When I looked, I saw that the group saying man came first had information on their screen about Adam and Eve i.e. clear mixing up of what they already know about creation and what they

were asked to do here, which could have easily been cleared up [but was not].” (Observation B)

In this debrief, another student tried to challenge the findings of a group and was ignored by the cover supervisor facilitating the session. The praise that suggested that all students had done well may have resulted in some leaving with a misconception that either answer was accurate. All teachers observed seemed reluctant to do anything which infringed upon student independence, even during the debrief, presumably because the rule about non-interference was so dominant. However, this reinforced the students’ assumption that producing some information was not only acceptable, it was the desired outcome, which appeared to limit the learning that took place during SOLE. Thus at Hillside School, students were given the freedom to manage their own learning and behaviour, however the lack of any clearly articulated outcome for SOLE meant that students had little understanding of exactly what they were temporarily responsible for.

5.4.3 Hillside School: What Contradictions Were Apparent and (How) Were They Resolved?

The object of the school activity system, which was to educate students to be successful in high stakes tests, conflicted with the partially invisible shared object between the two activity systems. The headteacher and Emily had intended SOLE use to create conflict for teachers, particularly surrounding the division of labour, in the hope that it would impact upon their beliefs about teaching and learning and lead to changes in their wider practice. However, the specific form of SOLE that Emily implemented actually resulted in more significant contradictions arising between the rules of SOLE and the school activity system object and the division of labour in SOLE and the school activity system object. It was ultimately the way in which the rules and division of labour prevented teachers from impacting upon whether students would learn the information that they required for high stakes tests that made it so difficult for them to use SOLE in this context. These contradictions will be explored later in this chapter, when the rules and division of labour at Hillside School are discussed in detail. However, teachers also experienced some conflict between their dual motives during SOLE, specifically the

motive driven by the object which obligated them to prepare students for high stakes tests and the motive to provide students with an education that was about more than those tests.

- ***Motive to Educate Students by Preparing them for High Stakes Tests and Motive to Provide Students with an Education Beyond Passing Tests***

Many teachers felt constrained by the object, yet believed that students should have an education that was about more than simply passing high stakes tests. Some teachers appeared to believe that the object had so distorted their practice that it changed what it meant to teach their subject, redefining it according to prescribed content which had to be covered at speed,

“because of how heavy the curriculum is, you’re not actually teaching Science any more, you’re teaching ‘the Science Curriculum’. So, in a sense the students’ education, because of the system we’re in, loses a little because ... Science very much is all about exploring and discovering and those kinds of things, but you’re constrained by time limits” (Teacher 8)

The motive to prepare students for high stakes tests made it difficult for teachers to spend much of their curriculum time doing SOLEs because they could not guarantee that those lessons would have sufficient relevance. This became a particular issue the closer students were to taking those tests,

“you get to the point where you’re sort of less about exploring and it’s just like make it go in your head, make it stay in your head, make it come out on the exam paper!” (Teacher 6)

“when they get up to GCSE, they don’t do that anymore, it’s exam questions, exam questions, exam questions! ‘Here’s what you need to know, that sheet’s everything, you don’t need to know anything else’ – I do it myself! ‘That’s ... all you need to know because that is what’s in the exam spec!’” (Teacher 7)

The language the teachers used here clearly evidenced the pressure they felt to achieve outcomes that would support the object of the school activity system and how that pressure impacted upon the decisions they made concerning what and how to teach. In their attempts to resolve this conflict, teachers carefully designed the SOLE questions they asked in the hope that

they would guide students towards the specific subject content that the syllabus required. The questions they posed during the SOLEs observed as part of this data collection confirmed this (Appendix E), as did Emily,

“it was a question that had a specific designed answer for a Maths lesson, it was something along the lines of ‘Where would you find mathematical transformations in a real-life context?’ Which is something I actually worded from what they gave me because it was even more specifically designed than that originally,” (Emily)

Thus, teachers tried to resolve the conflict between their dual motives by designing a SOLE question that would direct student learning towards a relevant section of the curriculum, while still enabling them to provide students with an independent learning opportunity. However, the rules and division of labour that existed within this system made any intervention during the SOLE impossible and the question alone was not a sufficient guarantee that students would cover relevant context,

“[SOLE Question: How do myths influence aboriginal art?] Teacher didn’t feel that they’d found out very much, only one group had the rainbow serpent myth ... which appeared to be what she’d wanted them to come away with” (Observation D)

Where the question did not facilitate students learning information relevant to the curriculum, teachers were unable to intervene and there was a perception that SOLEs could equate to wasted learning time. Thus, they tended to narrow the scope of SOLE use by opting out of using it at all, particularly with students who were close to taking high stakes tests,

“I wouldn’t use it if it was coming up to exams, it’s not a good space I don’t think for revision and sort of focused learning leading up towards assessment time.” (Teacher 2)

“I can’t see me bringing a class of Year 11s two months before the exams truthfully. Although that’s not to say it wouldn’t be useful, but I can’t see me being relaxed enough to do that because, well, of all the pressures that are on you.” (Teacher 6)

Although these teachers only explicitly stated that they would restrict SOLE use with students due to take assessments, the SOLE Room booking data presented earlier in this chapter suggested that they rarely used it for their own subject teaching with any year groups. However, the motive to provide

students with an education that went beyond passing tests was significant enough to encourage teachers to use SOLE for sessions that they were not held accountable for. In particular, SOLE Room usage data showed that SOLE was more commonly used for Time for Success, Hillside School's extra-curricular enquiry programme, than for examined subjects; almost one fifth of all SOLE Room bookings during my data collection period were for Time for Success sessions. Similarly, one of the SOLE sessions observed as part of this research (Observation F) was repeated with two groups on a teacher strike day when a reduced number of staff were supervising students and they were not teaching their usual timetabled classes. Other examples of SOLE being used for none-subject specific learning were described during interviews,

"I've done a thing where one of the classes I had linked with a school in India. And they'd actually, they'd stayed back after normal school time to be able to do that with us! And it was quite funny, despite sort of language barriers and things ... after about 10 minutes they were almost cracking jokes with each other and really responded well so it was good to see that, you wouldn't normally get that experience"
(Teacher 5)

"[A member of staff] looked at students who'd been in our seclusion room, which is the alternative to exclusion, and grouped them into those who'd been in for assault, ones who'd been in for discriminatory language, or whatever it might be. She brought them down and did different [SOLE] sessions with them to try and counter the behaviour really." (Teacher 11)

Therefore, some teachers were able to resolve the conflict arising from their dual motives by exploring alternative ways that SOLE could be used, without impacting on curriculum time or subject learning. For those who were able to do this, SOLE apparently became a palliative solution to the conflict they experienced daily, where they satisfied their motives of giving students opportunities to be independent and to work collaboratively by finding spaces that were not stifled by the object of the school activity system. The fact that the SOLE Room was used so little offers evidence of the scarcity of such opportunities in secondary schools at present.

To conclude, the contradiction that arose between the motive that derived from the object of the school system, which was so narrow and inflexible, and the motive to provide a wider educational experience, was difficult to resolve because of the way that SOLE was appropriated at the school. Teachers responded by rarely using SOLE at all, particularly for their own subject teaching, which suggests that they found the contradiction insurmountable. This despite the fact that all teachers interviewed or observed at Hillside School, with the exception of two, spoke very positively about the potential of SOLE in secondary education.

5.4.4 Longford School: Object of the Activity System

At Longford School SOLEs occurred within the school activity system, which was driven by the object of educating students, as measured by high stakes tests; please refer back to figure 5.6 (p.97) for a graphical representation. Therefore, working towards that object, which manifested as an outcome that students engaged with subject specific content, was one motive for teachers to use SOLE. However, there was an additional motive related to providing students with an alternative learning experience in order to develop them as independent learners, and it appeared to be this that prompted teachers to choose SOLE over a different learning strategy at any particular time. As a result, teachers sometimes perceived that developing student independence was their main aim during SOLE, although it was clear that preparing students for high stakes tests always emerged as the dominant priority.

- ***Object of SOLE for Teachers***

Just as at Hillside School, the object of the school activity system at Longford School was to educate students, where that meant preparing them to pass high stakes tests. During SOLE, this object translated into a specific outcome requiring students to acquire a particular bit of subject knowledge, as dictated by the curriculum. SOLE success was usually judged according to how much of that knowledge students engaged with during the session,

“I’m not sure how much they, in terms of the Geography, how much they got that they could use in their exam, which was not the whole point but is a fairly fundamental point in Year 10.” (Teacher D)

“Students begin the SOLE. When asked, the teacher tells me that ‘success’ will be judged on the Maths they use when presenting: ‘I haven’t taught them surface area of a sphere!’” (Observation 8)

Thus, a priority for teachers during SOLE was the acquisition of a fairly specific range of subject content and they were explicit about the fact that the extent of that coverage was their measure of success. However, just as was evident at Hillside School, there was another motive apparent which centred around providing students with a wider educational experience and helping them to become more independent learners. Many teachers cited this as a significant motivator,

“The thing that I particularly liked about SOLE was the idea of students growing it for themselves, so it’s not just a case of me sort of didactically teaching them, but it’s about me giving them a question that’ll then enable them to get interested in something and engage with something, and think critically about something as well.” (Teacher A)

“it’s really good for when they leave school, they will have to work with different groups of people or they might be in a different environment and they’re not just sat doing work in a book like in a typical classroom setting. They are more in charge of themselves and their own learning and they can go in a different direction and they have more freedom.” (Teacher G)

Teachers seemed to assume that, because SOLE was designed to give students responsibility for their learning, it would automatically facilitate the development of the skills they needed to be independent learners. For many, giving students the opportunity to experience this alternative approach to learning was a very appealing option and, just as at Hillside School, SOLE appeared to offer resolution to an existing conflict between some teachers’ beliefs about what education should ideally provide and the reality of the system within which they acted,

“it’s [SOLE] about developing their deep learning and just them becoming more independent and I do think we just spoon feed them too much and it’s about giving them that [freedom], and a lot of them love the fact they’re allowed to do that.” (Teacher F)

In offering a resolution to this conflict, it was the opportunity for students to be independent which motivated teachers to use SOLE. Nevertheless, they

only did so at a time when they thought it could deliver an outcome that was relevant to the passing of high stakes tests and it was clear that teachers did not feel able to act without any consideration of this object.

At Longford School, the headteacher's motivation for encouraging SOLE use was aligned with the teachers. He clearly understood that students passing high stakes tests was a priority because he described how the assessment system might act as a barrier to some teachers using SOLE (Headteacher). However, he was also a strong advocate of SOLE as a means of developing student independence, something which he argued the school was already committed to through its skills-based iLearn curriculum in Year 7, and he cited this as an important reason why he wanted to have a SOLE Room at the school,

"[the SOLE Room] came after we were devising the learning habits [iLearn curriculum] ... and then this seemed to come along and it was almost like a natural extension of it and I suppose we were encouraging our children here to be really powerful, resourceful, independent learners and SOLE is a bit of that ... the whole concept of it is there to actively encourage children to become more independent and resourceful and so on" (Headteacher)

This combination of supporting students to become more independent learners, while also preparing them effectively to pass high stakes tests, was echoed by the teachers at Longford School and thus the motives for SOLE use were consistent.

- ***Student Perceptions of the Outcomes Required From SOLE***

Teachers did not explicitly discuss with students the outcomes they wanted from SOLE, either in terms of subject content or the development of independent learning skills, despite the fact that it represented a very different approach to learning from their usual lessons. This resulted in some uncertainty for students about what exactly was required of them. Although they would typically work hard to find 'an' answer, it was not usually apparent that they genuinely believed that answer to be accurate and most did not seem to worry about whether they could confidently defend it,

“One group claim to have finished ... Teacher says, ‘I need to be convinced.’ They explain their answer to her and she says she is not convinced; more thought is needed. At this point the boys who had done much of the thinking prior to this lose interest a little and leave the girls to work out some details. Teacher tells me that their answer is not at all close to the ballpark figure she expects.” (Observation 8)

“[SOLE Question: Why do people speak different languages?] Presentations were given. All groups had something to contribute, some gave a variety of reasons in answer to the question, others gave just one but it seemed unlikely they believed it e.g. Tower of Babel. (Students really struggle to formulate ‘an’ answer to a question. They can give a list of theories or give one answer that they found but they don’t give their justified answer to a question.)” (Observation 9)

“Teacher, ‘I’ve got one of you saying it takes six months and another of you saying it takes two years. Surely if you’re talking as a group there should be some consistency?’” (Observation 33)

Students were clearly content to have found information that they could claim answered the question, regardless of whether that answer might withstand scrutiny or whether everyone in their group agreed with it. Students perceived that what they were required to do during SOLE was be seen to work hard, as evidenced by the production of some information; they did not seem to recognise a need to have understood the answer they gave or to be able to explain it further. Just as they had at Hillside School, students defaulted to creating something, most often a PowerPoint, that might suffice as evidence of their efforts, appearing to assume that so long as they could be said to have produced enough, they would be deemed to have met expectations,

“Group 6: one student is writing on the paper. She asks the rest of her group to read out what it says on the screen so she can write it down. A little later, students from the same group are copying information from a page. One student ends up taking out his phone and photographing the screen so he can copy it down.” (Observation 17)

“[SOLE Question: If the UK was a sweet, what sweet would it be?] One group opens PowerPoint before Google. (Know they need a presentation. Begin it before they have anything to say. They work diligently throughout the session but whenever I’m watching they’re deciding on the colours to use, copying and pasting packets of jelly babies to put around the edge of the screen etc. Engaged, but low level.) ... Three

groups make PowerPoints, while also writing on walls or flipcharts, to no obvious purpose. One group makes up song lyrics to popular tunes incorporating the name of their sweet.” (Observation 19)

“Group 1: a student has typed lots and keeps showing the teacher who comments that they measure value of work in ‘how much’. The student keeps saying ‘look how much I’ve done!’ and ‘I’ve done more now!’” (Observation 23)

It seems clear that students were unable to create answers to SOLE questions without support, indeed it was not obvious that they even recognised the creation of an answer as a desirable outcome of SOLE. Instead they took their lead from the teachers and focused on acquiring specific information by researching the relevant topic. They did not make a distinction between meaningfully learning something and having information written down somewhere. Therefore, in some SOLEs, groups of students appeared to be working very diligently, but the outcomes produced were low level,

“One group was clearly working to explore the information and find an answer. No obvious excitement about the topic but they appeared to work throughout the session ... Debrief: the group offered two points and developed them a little. (Their presentation was fairly short and it sounded quite copied and pasted – could they have elaborated on these points? I doubt it, they could not read some of the words.) (Observation 3)

In most observations at least one group gave such a presentation and very few teachers challenged them on whether any real learning had taken place, which served to perpetuate a belief that producing ‘something’ was sufficient. However, this type of presentation, which was ubiquitous at Hillside School, was less prevalent at Longford School because teachers were present in the room and they all mediated student learning to some extent. Generally, this ensured greater engagement with the information found, which was evident during debriefs when most students could develop their answers to varying degrees when challenged to by the teacher. While the learning was still typically based around the acquisition of new information, with little to no application, there was nevertheless evidence of knowledge being both acquired and understood. Thus, the debriefs observed at Longford School

usually demonstrated more developed understanding than at Hillside School, presumably as a consequence of teacher mediation during the session.

In addition, while the quality of discussion during the debrief varied depending on the facilitating teacher, it was apparent that being present for the whole SOLE session enabled some teachers to manage the debrief skilfully to develop student understanding further. Teacher S stated explicitly that there was a significant benefit to being present,

“the teacher’s role is key in that if they are in the room and making notes, they can add to the feedback at the end, correct any misconceptions and discuss with the class what they saw, how they felt the lesson went and ask pointed questions on what direction the learning and behaviour went in throughout the SOLE.” (Teacher S)

An example of this occurred during a SOLE in which the teacher intended that the students would learn about the Fibonacci Sequence. The learning that was evident during the research phase of the SOLE varied considerably between groups so in the debrief the teacher deliberately sequenced the feedback to ensure that each group’s contribution built on the previous one, becoming more sophisticated as they went,

“Group 1: links sequences to the patterns of the snail & sunflower. (No numbers link). Group 2: link the colours of the snails and sunflowers. (No numbers link). Group 3: links to growth in patterns, the number 1,000 is mentioned as being important. (Begins to link to numbers). Group 4: much the same as group 1. (No numbers link). Group 5: reference Fibonacci, the Golden Ratio, nature’s numbering system, albeit with no explanation. Teacher fills in the explanations for them eg Golden Ratio is 1.6. (Found what teacher hoped, though with little explanation). Group 6: build on the previous group’s answer by explaining the Fibonacci sequence a bit, including drawing a diagram on the board to illustrate. Can explain the sequence 1, 1, 2, 3, 5, 8 etc when asked to. Teacher then explains a bit more fully and links to previous work on perimeter. (These students have a fairly sound grasp and are able to explain it to other students). Another group links this information to a picture they’d seen and finds it to show the class, illustrating a spiral based on Fibonacci. A student from Group 2 then explains that they’d also seen that photo and something about the Golden Ratio during the session.” (Observation 4)

In this example, those students who had made little progress towards the teacher’s desired learning outcome during the session were able to

understand it through the debrief, even linking to relevant information they had found themselves. This was because the teacher structured the debrief in such a way that the information was effectively scaffolded and she was only able to do this because she had knowledge in advance of the information the students would share. In this way, teachers were able to mediate to support students in working to achieve specific learning outcomes that fed into the object. Students were therefore more likely to achieve something relevant to the object, albeit at the expense of the SOLE rules and the intended shift in the division of labour, which is likely to explain why SOLE use for subject teaching was more sustainable at Longford School.

5.4.5 Longford School: What Contradictions Were Apparent and (How) Were They Resolved?

For the majority of teachers, the range of conflicts they experienced derived from a fundamental contradiction between the object of the education system and the rules and division of labour of SOLE which appeared to make it so difficult to work towards that object. These contradictions will be explored later in this chapter, when the division of labour and rules of SOLE at Longford School are discussed in detail. However, as was apparent at Hillside School, teachers at Longford School also experienced conflict deriving from their dual motives for SOLE use which was exacerbated by their lack of understanding of how to facilitate SOLE in such a way that they could work towards the object while simultaneously providing students with an opportunity to learn more independently. Most appeared to assume that learning was a natural by-product of SOLE, if done correctly, in much the same way that they assumed that simply leaving students to do things without teacher interference would result in students becoming independent learners.

- ***Motive to Educate Students by Preparing them for High Stakes Tests and Motive to Provide Students with an Education Beyond Passing Tests***

While the object remained constant, most teachers at Longford School were constrained by the perception that they had to do SOLE 'properly' in order for students to have a meaningful experience of independent learning, which

for the majority of teachers meant not intervening in student learning. Yet leaving students to learn without any mediation at all meant they were less likely to access the specific content that would help them pass high stakes tests, which was necessary to work towards the object of educating students. This was vital because the system of accountability within which teachers operated focused entirely on preparing students for high stakes tests and they struggled with the possibility that SOLE might not support that,

“So [during the SOLE] the students found out an awful lot about the nature versus nurture debate in Frankenstein and an awful lot about different theories about what forms an individual, but if you put that in an exam context most of that knowledge would be completely useless. That’s maybe not the SOLE’s fault, it’s maybe the exam’s fault, but the fact of the matter is that I wouldn’t go and take a Key Stage 4 class and do SOLEs with them for a week because I don’t think they’d get what they need out of it in terms of the exam and I think it would be a big risk to do that regularly with exam classes, with the exams set up the way they are and asking them the questions that they do.” (Teacher I)

“there’s the time constraint, the stuff they need to know. It’s a shame there isn’t a bit more time because there’s so much that they need to know now ... I think it limits the amount you can use it [SOLE] because it’d be nice if you could use it more but I think that constraint with the content, needing to get through, that holds you back a bit.” (Teacher T)

“if you think about actually stripping it back and going to GCSE, they don’t need to put anything like that [information learned in SOLE] in their exam, they don’t need to really know the context of things, they just need to be able to write and do the skills and that kind of stuff and I don’t know if the SOLE Room really helps with that” (Teacher V)

The language teachers used was telling. They conceived of SOLE use as a risk and articulated the ways that they felt constrained by the object. It was thus the lack of control over student learning, which they perceived existed when allowing students some independence, that created the contradiction with the outcomes required in order to progress towards the object. This created a fundamental paradox for the majority of teachers who were motivated by the idea of allowing students to learn independently, but believed that in order to achieve that they had to leave students to work without support or mediation, which meant they could not ensure that students learned the content required to achieve the object. This conflict was difficult for teachers

to resolve because the pressure exerted by accountability measures resulted in the object being so dominant. As the SOLE Room booking data showed, teachers became less likely to use SOLE the closer students got to high stakes tests. There was also a significant spike in the number of SOLEs that were booked in the final half term before the summer holidays, with over a quarter of all SOLE bookings made in that half term. At this time in the school year, high stakes tests have been completed so the work for which teachers are externally accountable has been done. It is not uncommon for teachers to take the opportunity to experiment with new ideas or strategies at this time, indeed Teacher C expressly stated that she had done this with SOLE. This would suggest that teachers were keen to develop their SOLE practice, however they may also have felt more relaxed about using SOLE as an enrichment activity at this time, as opposed to a vehicle for teaching examined content in their subject.

It seems fair to assume that, without the motive of providing a wider learning experience that offered student independence, teachers would have remained in their classrooms teaching subject content in their usual way. So, at the point at which teachers chose to use SOLE, student independence was their dominant motive. Despite this, teachers never discussed evaluating skills development or enriching student learning as a way to measure the success of a SOLE, presumably because they had no metric for gauging the extent to which students had progressed towards those outcomes during a session. Instead, they defaulted to measuring the success of a SOLE against the outcome required for high stakes tests and SOLE sessions tended to be structured around learning specific content, which fed into the object. The confusion arising from their competing motives was exemplified by two teachers who explicitly argued that developing student independence was their main priority in SOLE, denying that the content learned, the outcome that would feed into the object, was important,

"I am not that bothered about the actual specific outcome in terms of 'they have to learn x, y and z' and I think if you are going into the SOLE Room with the idea that the students should have learned all these things by the end of the lesson, then I think ultimately you probably

shouldn't do it, you should just teach whatever you want to teach so they know x, y and z." (Teacher B)

"in a normal classroom situation, you give a big question and they expect to find an answer, whereas in a SOLE Room it doesn't matter about the answer really, it's just the process of how you're going about that." (Teacher C)

Both of these teachers indicated that the process the students went through and the skills they might develop as part of that were the most desirable outcomes of SOLE, suggesting that the motive of developing student independence took precedence. However, during SOLE observations with Teacher B (Observations 15 and 16) his actions contradicted this claim,

"Teacher intervenes to refocus students ... After a while teacher returns to the same group and says they are still not looking at what they're meant to be looking at. Student: 'But we don't know what to look at.' Teacher talks through where they're up to and questions them so they see what they still don't know." (Observation 16)

In this extract, it is clear that the teacher was unwilling to allow students to leave the session without covering the intended subject content or 'what they're meant to be looking at', in line with the object. While his motivation for using SOLE appeared to be the opportunity for students to be more independent, in reality it was the acquisition of specific information that was prioritised. He experienced conflict between his motive for using SOLE and the outcomes he was ultimately held accountable for, as determined by the object.

Teacher C was not observed as part of this data collection, so it is difficult to assess how far she intervened during SOLEs to steer learning in a particular direction. However, she suggested later in her interview that the acquisition of relevant subject content was in fact important,

"whether that [the learning during SOLE] is what I need to teach them in the time frame is another thing. This is always the issue ... if you've got a class who are quite studious, who are on board, you can rely on them to work very hard, I think then you can give them a big question and let them go because it serves the purpose in that at A Level if you give them

a big question, what they find, a lot of it, will be what I need to cover as part of the course," (Teacher C)

While this teacher argued that the important outcome of SOLE was the experience that students had, suggesting that skills development took precedence, in reality she also wanted students to find information relevant to the syllabus and was wary about using SOLE if it would not feed into high stakes test preparation due to time pressures.

Both of these teachers can be said to have articulated the experience of the majority of teachers at Longford School, as reflected in interviews and observations, because all those who used SOLE stated that they were motivated by the opportunities it provided for students to be independent and to develop skills that they believed were often lacking from their usual classroom practice. Yet they were restricted by the definition of educating students that was the object in the wider activity system and thus they required students to make progress towards that during a SOLE, just as they might in any other lesson. In some SOLE sessions, the shift between motives was evident even as the session progressed as the teachers started by encouraging independence and adherence to the SOLE rules, then became more focused on the specific learning outcome as they got closer to the debrief. Ideally, teachers would have been able to achieve outcomes that satisfied both motives simultaneously but this was rarely evident because the majority of teachers lacked an understanding of how to manage SOLE to achieve this, although some exceptions will be discussed in the next section. Thus, despite student independence being the main driver for teachers to use SOLE, the focus during the sessions themselves always drifted back towards the learning of particular subject specific content. In this way, SOLE became an activity that was motivated by enriching their subjects and developing student independence, yet ultimately focused on achieving outcomes to satisfy the narrow object, as measured by success in high stakes tests. In order to achieve both, varying levels of mediation were introduced which resulted in some teachers creating hybrids of SOLE that appeared to be more sustainable.

5.4.6 Some Exceptions: Teachers who Satisfied Both Motives During SOLE

There were two teachers at Longford School who did seem to be able to work towards the object during SOLE, while also acting within the SOLE rules to provide students with opportunities for greater independence and thus moving beyond the widely perceived dichotomy between the two. Both of these teachers conceived of SOLE as a set of principles, rather than the procedural, or even behavioural, framework that the majority understood it to be. Neither of these teachers appeared to experience conflict when using SOLE to achieve the object because they were confident about adapting it to support students to learn the required content independently; where they thought the SOLE process could be improved or developed, they changed it. These adaptations showed evidence of teacher understanding of a pedagogical underpinning to SOLE and a recognition that learning in this way required both the students and the teacher to behave differently.

- **Teacher A**

Teacher A conducted SOLE largely as the SOLE Toolkit (2014a) advised: she posed a question, gave students time to collaborate and research an answer, then debriefed what they had learned. The significant adaptation she made was to constantly mediate student learning because she recognised that students could not construct complex answers to such big questions without support. Her interventions were always responsive to what the students themselves were learning and any guidance she gave, which was typically posed in the form of a question, helped them to identify a way to move their own learning forwards. The interactions detailed below illustrate her approach,

“[SOLE question: Whereabouts in Newcastle should you live if you want to be a successful criminal? During the research phase of the session.]

*Teacher observes a group, ‘What’s this Zone of Transmission Model?’
Student answers. Teacher: ‘Could we translate this model to Newcastle?’*

Teacher observes a group, then ‘Have you looked at anything about the sociological theory on the location of crime?’ Student: ‘No – let’s do that!’

Teacher, 'Is that a good place?' Student responds. Teacher, 'Is there less opportunity to commit crime there too?' Student answers. Teacher, 'Can you explain your thought processes?' Student responds. Teacher, 'How is it different?'

(Students are focused throughout. They enjoy & often initiate interactions with the teacher.)" (Observation 18)

It is interesting that all of these interactions were either initiated by the students themselves, or began with the teacher observing the group. In this way she responded directly to their learning and all her interactions came in the form of a question, to encourage students to continue to develop their thinking. Throughout, she challenged them to explain what they had found, or to link it to the wider context of the subject they were studying, or to articulate how and why they had reached their conclusions. Although the format of the session was no different to any typical SOLE, the students were supported in the development of their answers in a way that was rarely seen and which demonstrated some teacher understanding of the challenges that students faced in learning this way. It was also clear that this SOLE session fit into a wider series of lessons about the sociology of crime as they had covered some relevant content previously and at the end of the session the teacher told the class that in their next lesson, they would plan a group essay on the topic. Thus, there was a clear sense both that students knew the point of what they were learning and where it was going next. In her interview, Teacher A talked about working SOLEs into appropriate places in schemes of work, for example 'Which film is the most post-modern?' was a question posed to students who had already learned about post-modernism and needed to understand how to recognise abstract features of a theory in everyday life. Similarly, 'Can you be religious and be a scientist?' was asked of students who were completing a unit of work entitled 'Does God exist?' in which they had already looked at religious experiences as possible proof of God's existence and were now being challenged to consider scientific arguments for or against (Teacher A). For this teacher, SOLEs were not a way of enriching classroom learning, or an addition to it, they were an alternative way of engaging with the curriculum when she deemed such an approach appropriate.

Although all teachers observed at Longford School mediated during SOLEs to varying extents, Teacher A was noteworthy for the manner in which she conducted interactions with students. This was most apparent during the debriefs where she engaged students in a dialogue, albeit one that was mediated by her. Most teachers would start the debrief by asking a general question about what students had 'found out', whereas Teacher A would ask the first group the exact question she had posed. This encouraged a direct response, rather than general talking around a topic,

"[SOLE question: Do miracles happen?] Debrief. Group 1: student reads from their sheet. They tell the story of Lourdes, but don't specifically answer the question. Teacher, 'does that story make you believe in miracles?' Students give thoughtful answers e.g. 'yes, it proves she was cured but not that the Virgin Mary appeared.' Group 2: Teacher asks, 'can you tell us the other side?' (i.e. that miracles don't happen). Student explains that there are scientific explanations of some miracles. Teacher, to the other student in the group, 'do you agree?' Student, 'I can't decide because of things like spontaneous cures.' Teacher, 'can anyone give evidence of that?' Another student reads a story about a cancer cure. Group 3: Teacher (directed to a specific student), 'You have a poster saying miracles don't happen, so can you disprove that?' Student, 'Yes – they might lie[...]' Moves away from the point. Group 4: Teacher asks whether they were persuaded either way in answer to the question and a student says no. Teacher asks why. Student, 'We haven't really defined what a miracle is yet.' Group 5: Teacher 'what was your end point?' They say they had a mix of everyone else's answers. Teacher, 'what do you think are the most important points then?' (Observation 10)

This data suffers from the fact that observations were recorded as field notes and it was impossible to record all dialogue at speed, thus some of the detail and follow up questions are missing, however there are some key elements that are worth unpicking. For example, the teacher did not ask all groups to simply present their answers in turn, as most teachers in both schools did, instead she expected them to build on each other's points as a dialogue. Thus, when she addressed the second group to feedback, she asked them to give the opposing view to the first. This created a fundamental expectation that everyone listened to the information shared and modelled the collaborative co-authoring of an answer. Similarly, Teacher A encouraged students to give their own justified opinion in answer to the question, rather than accepting a list of possible answers. As a result of the questions that she asked, students

were clearly thinking about the information they had found and how it related to the question, as well as reflecting on their own considered answer to that question. This was very different to the majority of debriefs observed where students were content to give 'an' answer and demonstrated little engagement with the information beyond that.

Although in a practical sense, Teacher A managed SOLE sessions in the same way as the vast majority of teachers at Longford School, it was nevertheless evident that the approach she took to student learning was different. She did not position herself as an expert who already had an answer and, although she clearly anticipated the type of content students were likely to cover, she appeared to prioritise helping them to construct an answer from the information they found over coverage of particular content. As well as adhering to dialogic principles while mediating SOLE, Teacher A also demonstrated a greater understanding of the SOLE rules than the majority of her colleagues, giving particular consideration to their purpose from a pedagogical perspective,

““what I've always tried to avoid doing is a SOLE lesson in another computer room because I think as soon as you have more than the number of computers that you need for a SOLE, it just becomes four kids sat in a row, who are the same group but not talking to one another, each individually looking at something. And then you don't have the thing that makes SOLE so good which is the collaboration and the discussion.” (Teacher A)

She also reflected on the sessions she had facilitated and adapted her practice in order to promote effective student learning. She considered herself to be responsible for how successful a SOLE was, despite the shift in the division of labour towards the students, and as such she spent time planning each session in advance,

“I think the success of the SOLEs has been largely on my shoulders, in the sense that if the question that I've come up with is a good enough question, then it will be successful. If I allow enough time to properly debrief it, then it will be successful ... I can see now, a year in, why my questions are better than they were a year ago and I think that's just from going through the process of actually doing SOLE ... I've picked up things along the way like Google the question and make sure that there's

not a website that is dedicated specifically to that, or if there is then you can have a discussion about why that website might not be the best ... it's like anything, you learn every time that you do something that 'ah actually, this is what I could do to make this so much better than last time'." (Teacher A)

For this teacher, facilitating effective SOLE sessions entailed a process of reflection and refinement. Consequently, she was able to find a way to support students to construct answers to the big question relatively independently, while also achieving an outcome that worked within the object of the activity system. In this way, SOLE was ultimately a sustainable innovation for Teacher A, albeit a hybrid version of Mitra's original concept.

- **Teacher H**

Teacher H viewed SOLE as a set of principles, rather than procedures to be followed, which meant that he engaged in consideration of the purpose of the SOLE rules. Thus, he was able to find a way to satisfy both of his motives for SOLE use, which meant that he did not experience conflict,

"there's no barriers if you're prepared to take the theory [of SOLE] and twist it in the direction that you're wanting to use it. [I: So, would you use it with exam classes for example? Would you use it at exam time?] Yes. Well that's [indicates SOLE work on the desk] an exam class doing A Level Anatomy and Physiology, working their way up to an exam."
(Teacher H)

He was very proactive, having created his own SOLE Room even before Mitra's room was opened at the school, and the multifunctional nature of that room was evidence of his understanding of SOLE as something that was open to adaptation,

"I have done creative tasks through SOLE and I believe that the same kind of collaborative learning and self-organised learning can happen without computers, and I've done tasks before that have been creative tasks where they've got to create models as groups, but I've done it by posing rich questions and the process is a bit different but the way that they interact together is a self-organised thing. So, I don't think that it's just about using computers, it can be any medium ... so it can actually fit perfectly into project-based learning as well, mixing this aim of coming up with an end product while doing it very much in a SOLE-style."
(Teacher H)

Here, Teacher H questioned some elements of SOLE that most other teachers considered to be fundamental, such as the use of the Internet and the posing of a big question as the stimulus. He was comfortable with such changes because he conceived of SOLE so differently to his peers,

"I think it is more of a model of learning, a way of learning, which good teachers can adapt and use appropriately. It's just about self-organising, allowing people to teach each other in certain ways that are independent, encouraging independent learning, encouraging no cap on learning and people can be free to discover lots of different things ... If you keep in your head that the idea is that they're doing it by themselves then I think that's alright." (Teacher H)

It is striking that at no point during his explanation of SOLE did Teacher H refer to the rules that other teachers felt so constrained by. For him, students moving around and teachers standing back were examples of how SOLE might be facilitated, rather than directives, because so long as self-organising was at the core of the activity, he believed that a SOLE could be said to be taking place. This freedom he felt to adapt SOLE meant that he did not experience conflict with the object of the activity system and thus it was sustainable for him in this particular context.

Similar to Teacher A, Teacher H also reflected on the SOLEs he had facilitated and was prepared to adapt the process where he perceived that improvements could be made, introducing strategies to address any issues he identified. For example, in the first SOLEs he facilitated, Teacher H was concerned that there seemed to be a lot of wasted time right at the start of the research phase of the session while students tried to work out what to do,

"that initial problem of everyone racing around like headless chickens coming up with random questions and some of them being on track and some of them not. Yes, that's all well and good but it does waste some of the time which could be learning ... What's the bet that the first question they'll search for is typing in the question that they've been asked? And then they have to learn from trial and error that that's probably not the best way to do it. So, we get them to actually do some real depth thinking beforehand and think, well in order to answer this question what kind of question do we need to ask first?" (Teacher H)

To resolve this, Teacher H introduced a tool he called the question wheel (Appendix I) on which students wrote the 'Killer Question' (the equivalent of a big question) in the middle, then in smaller boxes around the outside they created sub-questions which they would need to answer in order to construct their overall answer to the 'Killer Question'. He explained why he believed it was beneficial to student learning,

"It's completely self-organised, but it makes them understand that ... you almost need to be dissecting which areas you should be looking into ... I just gave them that sheet and said 'work together, you might just want to break down the question a little bit further'. So, by saying that, we're encouraging a bit of scaffolding there that takes away probably about 15 minutes of messing around at the start of a SOLE lesson ... [and] they'll go, 'well who wants to look into this question then?' 'Oh we could do this one.' They start to organise it because they've got such a simple planning structure ... everyone's got an area that they're looking in and it's all going to come together, so from the original question going outwards into lots of different subject areas and then coming back at the end to one big question ... I've done many different ways of doing SOLE but it's one way that I'm trialling at the moment. I've found it very successful." (Teacher H)

Here, Teacher H was focused on students' learning subject content, as prescribed by the curriculum, by ensuring that they did not waste time during the SOLE session and thus could engage with a greater range of information. He was responding to the accountability context of the activity system. Yet he also wanted to support students to learn independently and he recognised that scaffolding could help them develop the skills and strategies required to be independent in this context. Thus, rather than intervening in the session to direct students he developed a strategy to achieve both simultaneously. There was no conflict for Teacher H because, when he found that one element of the SOLE session did not appear to be maximising opportunities for student learning, his perception of SOLE as a model meant he felt empowered to adapt it.

The other significant adaptation made by Teacher H related to his management of the debrief. He was sceptical about the extent to which a present and praise approach enhanced learning,

“And this is what I’m arguing is that a lot of SOLE lessons just stop with ‘this is what I learned’, everyone have a clap, you’ve presented information. That doesn’t mean you’ve made progress, that means you’ve written stuff down. What is the real measure of progress? Being able to see that they can argue and fight for the learning that they’ve actually done.” (Teacher H)

“if you really want to use it to be effective, you’ve got to pull together all these little segments of everyone’s learning and make the links with them.” (Teacher H)

Teacher H argued that the debrief was the most important part of a SOLE because that was where the meaningful learning took place. He expected that students should gain more from a SOLE than merely acquiring new subject content and he suggested that the debrief was where depth of understanding could be developed,

“it’s so easy for them to say ‘ok, I’ve got this off the Internet and that means I’ve made progress’ because they can read it out. That’s not progress, or it’s short-term, something they’ve got in front of them, but they need to demonstrate that they can make links, can think in an abstract way and the only way you can do that is argue like hell with them about it or completely destroy their theories so they actually have to argue it back. [I: You’re making it sound quite brutal!] It is! But that’s the most success I’ve had out of SOLE lessons, when they’ve been able to do that and you’ve had kids arguing like mad about it.” (Teacher H)

As a result, Teacher H approached the debrief in a variety of ways, depending on the group that he was working with. For example,

“I actually started at the end of the lesson with ‘what don’t you understand?’ as the question because I thought, well let’s challenge it, I’m not afraid if she didn’t get anything, it doesn’t matter. And this is a problem with SOLE: she’s got stuff, she’s actually got everything that’s relevant about the answer to the question, but she has no idea what the actual point of it is. So, she’s actually come up with a cognitive perspective of how thinking takes place, it’s a model of thinking but she didn’t know it’s a model of thinking. She knows it’s a cognitive approach – this is the greatness of SOLE, the freedom of being able to learn all these things – but she didn’t really understand the word cognitive properly, that was still an issue, and also, she didn’t understand that this model is representing other thinking that’s going on ... So we talked it through as a class and were able to suggest that this is a model and I went further and gave my teacher input, but at that stage they were

really engaged and really interested so it only needed a little bit of teacher input of going 'well it's actually a model to represent all that!' and that made the penny drop and then we had the learning which actually took place." (Teacher H)

It was clear that Teacher H expected much more from SOLE than the acquisition of subject content. It was not that he considered such content to be unimportant, rather that it was only the starting point, so he spent time planning SOLEs to ensure that he was enabling students to develop as much understanding as possible. In the only SOLE observed with Teacher H (Observation 36), he had pre-prepared a list of questions that he anticipated using to develop student thinking during the debrief. He did not work his way through the questions, rather he used them to respond to the information students gave. The focus remained on what the students had learned, while also helping him to ensure coverage of the required content. This debrief was also notable for being the only occasion, in all observations across both schools, where students were told that their findings from the session were insufficient,

"[SOLE Question: When is it right to diet?] Teacher, 'Give me another – what is the South Beach diet?' Student says she doesn't know. Teacher, 'why write it if you don't know? Are there others up there that you don't know?' ... Teacher, 'I'm a bit disappointed by this. I don't think you did nothing; I saw that you were engaged, but your answer is disappointing. I'm going to come back to you for more later.' (Raises expectations about what students should be producing from a SOLE, rather than praising anything presented.)" (Observation 36)

Teacher H made it clear to students that the expectation during SOLE was not merely the production of 'an' answer, rather there was a requirement to engage with the information found and to think about it. Although teacher mediation in the SOLE sessions meant that this kind of copied and pasted student presentation was less likely to be observed at Longford School, nevertheless most sessions included one such presentation and it was often given by a group who had been nominally engaged in the task and seemingly diligent. Teacher H explicitly addressed this paradox in the exchange noted above. Interestingly, he did not personally mediate the SOLE session observed, choosing instead to use a Police Person (nominated student) who

he interacted with on occasions. He was nevertheless able to monitor student learning during the process because one feature of his adapted SOLE Room was to have white boards for each group to write their answers on,

"I actually don't like the idea of getting the kids, as their end product, to do a PowerPoint. I've seen it time and time again, everyone says 'oh it's just going to be a PowerPoint' and the kids get focused too much on the activity rather than the whole point of what you're doing. So, if you've got whiteboards on all the walls one person in each group can be writing up on the whiteboard what they're finding out and you can, as a teacher, at one glance see exactly where the learning's at in every single booth, in every subgroup." (Teacher H)

For the majority of teachers at Longford School, mediating a SOLE session was an adaptation that they felt betrayed the true nature of SOLE by detracting from student independence, but it was considered necessary in order to ensure that something tangible was achieved as a learning outcome. For Teacher H, by contrast, SOLE adaptations were carefully considered in response to an element of the process that he felt did not maximise opportunities for student learning. His approach to SOLE was shaped by the fact that he viewed it as a set of principles, the practicalities of which could and should be adapted to make it as effective as possible. As a result, he spent time reflecting on the strengths and limitations he perceived in the SOLEs he had facilitated. Where he felt that something was not fully beneficial to students, he found a way to adapt it, simply keeping in mind that it should maintain an ethos of self-organisation. Each of the little adaptations he introduced shifted the division of labour back into his favour because it meant that he was steering the learning, however gently, but he demonstrated an awareness that learning in SOLE would not spontaneously happen and that students would not acquire the skills they needed to either learn independently or effectively without some support, scaffolding or modelling.

5.4.7 Comparative Summary of How the Object Impacted Upon Appropriation

The objects of SOLE were different in the two schools because at Longford School, where SOLE occurred within the school activity system, the object

remained constant, whereas at Hillside School, where SOLE occurred within a neighbouring activity system, there was an additional shared object. Although this alternative object had a significant impact on the rules and division of labour during SOLE, as well as on the subject in terms of a redefinition of teacher identity, it was not actually apparent to the teachers who conducted SOLEs. Therefore, they assumed that the object of the school activity system remained during SOLE and thus, for teachers in both schools, the object was to achieve outcomes that would help prepare students for high stakes tests. This was problematic at both schools in different ways. At Hillside School, those outcomes were rarely achieved yet teachers had no capacity to intervene in the SOLE or to adapt it to ensure that the outcomes might be met in future, other than by careful framing of the question which, alone, was usually not sufficient. At Longford School, teachers found that the outcome could be achieved if they adapted the SOLE, but most teachers felt as though they were breaking the SOLE rules by mediating.

At both schools, teachers were motivated to use SOLE by their perception that it resisted the wider educational object; they valued the opportunities it provided to enrich their subject and to allow students more independence and freedom in their learning, away from the prescribed content of the curriculum. Yet this motive conflicted with the motive of working towards the object, so that even in the process of resolving one conflict, another was created. Although teachers explicitly argued that the motive of offering a more independent learning experience was dominant, in practice it was clear that the majority of teachers instead prioritised the type of content learning that students required for high stakes tests. In both schools, there appeared to be a lack of understanding about the pedagogy of SOLE which resulted in an assumption that both learning and developing wider student skills were natural by-products of SOLE, if done correctly. At Hillside School, where there was little evidence of students either learning the required content or developing as independent learners, teachers mostly opted out of SOLE use, or used it in the small spaces that were not dominated by accountability metrics. At Longford School teachers adapted SOLE, usually by intervening with both learning and behaviour as they felt appropriate. SOLE Room

booking data suggested that this made it possible for teachers to sustain some form of SOLE use, albeit irregular.

At Longford School, there were two teachers who did not appear to experience the same conflict of motives as the majority. Although they were equally focused on the motive deriving from the object, specifically that students would engage with relevant subject content, they appeared to be able to facilitate SOLE in ways that achieved that outcome while simultaneously supporting students to create answers to the big questions posed relatively independently. Part of the reason why they were able to achieve this was because they conceptualised SOLE differently to other teachers, seeing it as a set of principles that should underpin the learning process, rather than a set of procedures which dictated it.

5.4.8 Conclusion

In this section I have considered what the object of the activity was during SOLE and discussed how that impacted upon appropriation very differently in each school. As noted, much of the conflict regarding the object was exacerbated by the change to the rules and the division of labour that SOLE necessitated. In the next section I will consider the rules that were operative during SOLE sessions and how these impacted on appropriation, with particular attention to the way that they created tension with the object.

5.5 Conclusion

In this chapter I have begun to present the empirical data in answer to my research questions. The chapter began with a brief description of how SOLE was initially introduced in each school, which illustrated some stark differences between the two. I offered a brief summary of the two sets of SOLE Room booking data which gave an early indication of the extent to which teachers were able to resolve the contradictions they experienced during SOLE; there was significantly more engagement with SOLE use at Longford School than at Hillside School which suggests that there was greater scope for resolution at the former. I clarified how I understood the activity systems in each context, noting that at Hillside School SOLE use

occurred as an interaction between two systems, which contrasted with Longford School where SOLE was part of the wider education activity system. This clearly affected the object of the respective activity systems and the impact of this was explored in detail in the second half of the chapter. It was clear that the shared object of SOLE at Hillside School resulted in a very purist interpretation of Mitra's concept, although for teachers the education object remained prevalent. At Longford School the object of educating students to achieve in high stakes tests was dominant. In both schools, SOLE use appeared to resolve an existing conflict for teachers between the education system object and their wider beliefs about the experiences that schools should provide for students. As such, they were motivated to use SOLE by the opportunity for students to learn independently, as well as by the need to prepare them for high stakes tests, which manifested as an outcome of students engaging with specific subject content. Although the independent learning motive appeared to be the main reason why teachers opted to use SOLE, in practice this was not prioritised above preparing students for high stakes tests in either context. However, I also introduced two teachers from Longford School who appeared to conceive of SOLE differently to the other participants and thus were able to evade the conflicts that the majority of teachers experienced during SOLE use. In the following chapter I will present data relevant to my final research questions regarding the rules and division of labour during SOLE and it will become clear that the object significantly impacted upon the manifestation of both.

Chapter 6. Findings – Rules and Division of Labour During SOLE

6.1 Introduction

This chapter comprises the second half of my findings in relation to the research questions that framed this study. In the previous chapter, I discussed the object of each activity system. Here I will begin with a consideration of the rules that were operative during SOLE and how they differed in each school, partly due to the objects that defined the respective systems. I will describe the conflicts that emerged for teachers and whether they were resolved. Then I will discuss the division of labour that manifested during SOLE in each context in a similar way. For both the rules and the division of labour, I will begin by considering the schools separately to ensure depth of analysis, before offering a brief comparative summary of the two cases.

6.2 What Was the Nature of the Rules that Were Operative During SOLE and What Impact Did These Have on Appropriation?

6.2.1 Introduction

This section aims to describe the nature of the rules that were operative during SOLE sessions at each school, based on the data gathered from teacher interviews and SOLE observations. The schools will be considered separately to identify the different rules that were evident in each context and to explore the impact of those rules on SOLE appropriation. At the end of this section, a brief comparison of the rules in each school will be given to highlight similarities and differences between the two cases.

6.2.2 Hillside School: Rules That Were Operative During SOLE

At Hillside School the SOLE rules were interpreted by one individual: Emily. She was able to enforce adherence to her interpretation because she was recognised by the headteacher as the person responsible for SOLE within both activity systems: the school, where the decision to do a SOLE was taken, and the Arts Centre, where the SOLE actually took place. Please refer back to figure 5.5 (p.96) for a graphical representation of the neighbouring activity systems at Hillside School. The rules as they manifested here had two functions; to curtail the influence of teachers and to liberate students. This fit

with the shared object of the neighbouring activity systems, that of influencing the wider practice of teachers. It was assumed that insisting upon such a 'pure' version of SOLE, with so little opportunity for teacher intervention, would demonstrate to teachers how much students were capable of independently, thus encouraging them to make changes to their classroom practice.

- ***Interpretation of SOLE Rules: The Teachers***

Perhaps the most significant rule for teachers during SOLE was that they should not intervene during the main research phase of the session and the room was specifically designed to ensure that they did not need to be physically present, with a row of windows down one side of the room, facing into a corridor where there were sofas for teachers to sit on. This rule is not explicitly stated in Mitra's SOLE Toolkit (2014a), rather it is an extension of the guidance that teachers should stand back and try not to intervene. All teachers were aware of this rule and perceived that it restricted them,

"It's very hard work sitting outside and being aware of people being off task in the classroom and feeling that you can't intervene and can't actually get involved where if it was in your classroom you'd obviously step in straight away." (Teacher 2)

"I'm out there, they're in here [SOLE Room], you [the student] can get away without doing a great deal" (Teacher 6)

"he [cover supervisor leading the SOLE session] notes 'You can't go in if they're messing around.'" (Observation A)

As the tone of these comments suggests, teachers did not typically feel able to break this rule, even where they had concerns about student behaviour. Thus, the fact that teachers were not 'allowed' into the room for the majority of the session arguably became the defining feature of SOLE at Hillside School. A teacher who had never personally used SOLE confirmed this perception,

"Well the main difference [between SOLE and other learning experiences] I think is not being in the room, that's the biggest difference is the staff not being in the room." (Teacher 11).

This rule appeared to be followed remarkably consistently. Of the eight observations undertaken, there were just two instances of the rule being broken and both of these occurred when Emily was absent which suggests

that her presence altered teacher behaviour. The lesser contravention of the rule involved a teacher opening the door to the SOLE Room to speak to a student who they deemed to be behaving inappropriately,

"[cover supervisor leading the SOLE session] puts her head back through the door of the SOLE Room to say to a student 'stop messing around or you'll be removed.'" (Observation F)

Interestingly, they did not physically enter the room to give this instruction. This intervention was made by a cover supervisor, rather than a teacher, who may have been less familiar with SOLE rules or have felt more anxious about the poor behaviour of students, particularly as there was a senior member of staff present for part of that particular session. Regardless of their justification for breaking the rules, it was the only observed example of a member of staff giving a student a direct instruction during the research part of a SOLE. In the second example of rule breaking, the teacher transgressed completely by entering the room and walking around talking to students,

"Part way through the session the teacher goes into the room and does a circuit, talking to every group, asking how they're doing, whether they're making a PowerPoint etc." (Observation C)

This was a clear breach of the rule that teachers should not mediate during the main part of a SOLE session and it was the only observed example of a teacher entering the room while students were researching. Interestingly, this teacher limited himself to entering the room just once, despite being concerned about a student's behaviour later in the session,

"one student is on their phone for a while and teacher [says he] would usually want to intervene at that point. Doesn't though." (Observation C)

The fact that the teacher restricted himself from intervening a second time suggests that, even though he was prepared to break Emily's rule once, he still placed limitations on himself because he accepted that lack of teacher intervention was a necessary component of SOLE. It is evident that teachers did not feel that they had full right of access to the SOLE Room during the sessions. Even when there was a technical issue with a computer (Observation D), Emily entered the room to solve it, not the teacher, which illustrates the extent to which this rule dominated. The sense that teachers were not permitted to enter the room was strongest when Emily was present

but as the two examples of rule transgression given here occurred during the only two SOLEs observed when Emily was absent from the Arts Centre, it is difficult to know whether other teachers would have broken this rule had they perceived that they had an opportunity to do so. Certainly, none of the teachers interviewed as part of this research questioned the principle that teachers should be outside of the room during the research part of a SOLE and, while two teachers were sceptical about the learning which might take place (Teacher 4; Observation D), neither suggested that teacher mediation could or should be introduced. Indeed, it was widely accepted by all the teachers who participated in this research that not being present in the room was a vital component of a SOLE session. Thus, Emily's influence on the way that SOLE was appropriated in practice was evident, even when she was not present.

At those times when it was deemed appropriate for teachers to be present in the room, first to pose the question and later to listen to student findings, there was some variation in the rules that were apparent because there was greater scope for teachers to interpret them for themselves. All teachers enforced some restrictions on student behaviour and these were likely to have been in accordance with the NDS they expected in their usual classrooms,

"A very structured start – students asked to listen, cover supervisor counted down from 3 to 1, then asked students to write the questions in their planners." (Observation B)

"as they are entering the room, [teacher said] 'Find a group. No eating or drinking in here.'" (Observation F)

"Then [teacher said] 'First, we're back to the normal ground rules of the classroom' and gave examples such as phones away and listening to each other because we value each other. Gives a student a warning for talking when she is, then moves him." (Observation G)

It is difficult to be certain of the extent to which teachers replicated their usual routines and NDS during the start and debrief of a SOLE because no observations were undertaken in teachers' own classrooms as part of this research. Yet certainly the kinds of rules enforced, such as students being told to listen and not being permitted to eat, are fairly uniform across secondary school classrooms in England. The fact that one teacher

specifically referred to the type of behaviour they expect in their usual classroom would seem to confirm this. Therefore, when the dominant rule about not being present in the classroom was no longer applicable, teachers tended to move away from the SOLE rules and more towards their usual classroom rules. This can be explained, at least in part, by the fact that the start and end of a SOLE session required students to listen to each other and the teacher, therefore a higher level of teacher control would be considered desirable.

- ***Interpretation of SOLE Rules: The Students***

The SOLE rules as they pertained to students were understood in a completely different manner. Whereas those for teachers were directive, those for students were liberating as they were simply encouraged to adhere to the SOLE rules as stated in the SOLE Toolkit under “The Rules of the Game” (Mitra, 2014a, p.7). This meant that they were free to work in any groups they wished, they could move around freely to interact with any student they chose and they could take their learning in any direction in order to answer the question. The only rule that was framed as an expectation, as opposed to a suggestion, was that they must present their findings in the final phase of the SOLE. Despite this, in some of the observations undertaken there were groups of students who did not have any learning to share and either admitted this or scattered to different groups before the debrief part of the session,

“Almost all groups have found something. One student ended up working alone and he said that he hadn’t been able to find anything ... teacher doesn’t push him for any information.” (Observation D)

There was no discussion about, or consequence for, lack of contribution to the debrief during the SOLE itself, although teachers may have followed up back in their classrooms. Thus, the one expectation of students during SOLE was not always met.

There was some evidence, from both observations and teacher interviews, of students trying to adapt their behaviour to the particular rules of SOLE,

“General feel is very calm, there’s some moving between groups.” (Observation A)

"I've seen people move round groups to get good ideas to then take back to their own" (Teacher 9)

In these instances, students were observed moving around to share information as envisaged by the SOLE ideal and teachers did not attempt to control student behaviour, except the example of an instruction being given that was noted previously. Indeed, where students tried to ask teachers for greater guidance, they typically reminded them of the SOLE rules to encourage them to resolve issues themselves,

"One student comes outside to say that they can't find any information and need some help. Cover supervisor, 'Are you using Google? I've seen some students moving around between groups with whiteboards asking each other.'" (Observation A)

"Another student comes outside to ask if they can listen to music and is told they can learn however they want so long as the answers are good." (Observation D)

"A student comes to ask how to get Word on the computer. Teacher and teaching assistant give some suggestions, then teacher reminds student that she can ask other people in the room for help." (Observation G)

The teachers understood an effective SOLE to be one in which students were left to work completely independently. The rule of not being allowed in the room therefore essentially translated into no teacher mediation of learning and this was adhered to with remarkable consistency.

Despite the level of freedom that students had, their most common response to the SOLE rules appeared to be to regulate their own behaviour within the NDS they were so familiar with from the rest of their schooling. Although there were examples of students moving between groups, as noted above, for the majority of every SOLE session observed students behaved much as they might be expected to in a typical classroom setting: they sat in static groups, worked quietly and adjusted their behaviour when they thought an adult was watching,

"Some boys take rabbits over to a group of girls, they're all grabbing at the rabbits etc. One girl notices me watching and says something to the rest of the group, at which point they turn to look and then settle down." (Observation B)

"Students sat in their groups and the atmosphere seemed focused ... Little movement between groups observed." (Observation E)

This return to the types of behaviour that might have been expected in their usual classrooms may have been prompted by a lack of understanding of the SOLE rules and the ways in which they could promote student learning. Indeed, despite major differences with the rules of a typical classroom, there was very little attempt to ensure that students understood the value of the SOLE rules or how they might support learning. There seemed to be an assumption that students were familiar with the process, particularly where they had used SOLE before, so time was not spent discussing why the rules were different or how students might respond to them,

"[Teacher] Asks who's been in the room before, most put their hands up. Teacher 'Good – quite a few of you so you know how it works.'"
(Observation F)

In just two observations, one of which Emily facilitated, students were given some general information about the SOLE context at the start and this was followed by a description of the rules,

"Gives a brief introduction to the project: worldwide / independent learning / moving around the room to work with different people – your choice." (Observation G)

This was the extent to which teachers explained to students the reasoning behind the SOLE rules, and how and why it differed to the learning they regularly experienced in their classroom. There was no explanation of the purpose of the rules and how they might impact on learning. It was unclear whether teachers themselves fully understood this. Even where students followed the SOLE guidance and moved around the room, this was often interpreted by teachers as students being disengaged from learning. Students seen on their phones, or on websites that did not appear to be relevant, or moving around the room carrying the rabbits (plastic ornaments that were a feature of the room), were considered by teachers to be wasting time. The only person that participated in this research who held an alternative view was Emily herself. She argued that engagement in learning looked different during SOLE,

"I don't think engagement looks the same in a SOLE as it would elsewhere. It was fascinating to hear from one of our teachers ... 'oh, when their heads are down and they're getting on, then you know it's working really well!' I completely disagree with that because actually,

the boy who carries the rabbit around the room and moves across like a bee and pollinates all the other groups, or somebody who's sat for maybe 20 minutes and has looked like they're not doing anything, but actually found out the most powerful things in the first 5 minutes – it's just a different type of engagement.” (Emily)

Teachers did not seem to share this perception and instead judged student behaviour during SOLE sessions using the same criteria they used in their classrooms. This implied a lack of awareness of the purpose of the SOLE rules which inevitably meant that students themselves were not cognisant of the differences and were unlikely to understand how to learn most effectively in this context. At no time during any of the observed SOLEs were students encouraged to debrief how they had learned or to consider how the SOLE rules might support learning.

6.2.3 Hillside School: Contradictions for Teachers

The rules that were enforced during SOLE at Hillside School were designed to restrict teacher behaviour and this created conflict for teachers because they contrasted so markedly with the rules of the school activity system. In addition, the rules restricted teacher intervention and this led to conflict with the object of the school activity system.

- ***SOLE Rules in Arts Centre Activity System and Rules in School Activity System***

The most significant rule of SOLE at Hillside School was that teachers should not be present in the SOLE Room for the majority of the session. The effect of this rule was to create a space in which students were able to operate largely without rules, with just the expectation that they would present their learning at the end. This would have greatly contrasted with the rules of the neighbouring activity system in which teachers enforced both the wider school rules regarding behaviour and the NDS of their specific classrooms, which would have been highly personalised. This created a significant shift in the division of labour, with teachers essentially left powerless while students gained control; the consequences of this change will be explored further in the next section. However, while the rules had changed, the criteria that teachers used to judge whether a SOLE was going well remained much the same as in their own classrooms, therefore teachers found it difficult to stand

back and observe some of the behaviours that manifested in the SOLE Room without being able to intervene. For example,

“you can come along and see absolute hell on wheels! I’m thinking ‘well I wouldn’t want anyone to see that!’” (Teacher 4)

“It’s hard work sitting out there and you can see people mucking about with the rabbits and things like that and you just want to come in and shout at them,” (Teacher 7)

Being outside of the room meant that teachers could not readily monitor any learning that was taking place and so they tended to focus on what they could see, specifically student behaviour. As we have established, they tended to evaluate that using the same criteria they would in their classrooms, thus teachers often worried that students were not behaving appropriately or engaging sufficiently in the SOLE process. The teachers involved in this research, with only two exceptions, spoke wholly positively about SOLE, yet the SOLE Room booking data suggested that they struggled to resolve this conflict because very few SOLEs actually took place. As the teacher being outside the room was perceived to be the defining feature of SOLE at Hillside School, it seems reasonable to assume that this was a significant reason why teachers chose not to use it.

- ***SOLE Rules in Arts Centre Activity System and Object of Neighbouring School Activity System***

For teachers, the most significant contradiction arose from a loss of control over what students learned in a SOLE because the rules did not permit them to be present in the SOLE Room. Emily herself recognised this, but considered it to be a strength of SOLE,

“I think the joy of this is the teacher is genuinely not steering the outcome and the outcome is not one thing, it’s many things. So, it’s good when you get a range of answers – or wonders, or questions – rather than one particular thing” (Emily)

It was this lack of teacher mediation, which gave students ultimate responsibility for learning, that she hoped would be replicated in teachers’ normal classrooms. However, this attempt to impact on teacher behaviour created significant conflict with the object of the school activity system, with

the majority of those interviewed expressing concerns about SOLE within this context,

“in Maths we’ve got a huge syllabus to get through ... and it’s a case of right, it is very nice to do this but the time it would take them to get there naturally, sometimes you’ve got to think, ‘right, we’re moving on here,’” (Teacher 5)

“I probably would [use SOLE] if it wasn’t for the content-driven schemes, and obviously assessment and all the kinds of things that go with accountability within schools. There’s so many things, for me, to put you off it!” (Teacher 8)

This suggests that denying teachers access to the SOLE Room for the majority of a session meant that they were unable to focus student learning in a way that would support achievement in high stakes tests. Thus, the SOLE rules created tension with the object of the school activity system and a teacher’s inability to mediate learning in SOLE made it impossible for them to resolve this conflict. Ultimately, the only recourse they had was to be very selective about SOLE use, which helps to explain why there was not a single SOLE session undertaken with Year 11 throughout the data collection period. Many teachers went further than this and rarely, if ever, used SOLE at all which is reflected in the data relating to SOLE Room usage discussed previously. Thus, the conflict that teachers experienced relating to the rules of SOLE in this activity system was not resolved and resulted in greatly reduced SOLE use in this context.

6.2.4 Hillside School: Contradictions for Students

Students experienced tension between the rules that they were accustomed to within the school activity system and the rules that were operative during SOLE, particularly as they related to knowledge ownership. A small number of students also appeared to experience conflict within the rules of SOLE itself, specifically between the rule that gave them the freedom to regulate their own behaviour and the rule that created an expectation that they would give a presentation at the end of the session.

- ***SOLE Rules in Arts Centre Activity System and Rules of School Activity System***

Students appeared to experience some conflict arising from the rules of the school system, which had taught them to understand knowledge as private, and the more collaborative rules of SOLE. Certainly, when it came to sharing the information they had found, students could be reluctant,

“two boys went to a group of girls who initially minimised their screen when the boys asked what they’d found, seemingly reluctant to share.”
(Observation B)

“During the feedback, one group of boys claimed that a group of girls had copied their work ... The girls claimed this was untrue, it was in fact the boys who had copied from them. Cover supervisor pointed out that they can share information.” (Observation B)

The language used here, such as ‘copied’, suggests a clear tension for students between the rules of their usual schooling, where knowledge is private and learning is understood as a competition for good grades, and the ideal of a SOLE, in which students co-author their learning and use the expertise of the whole group to develop everyone's understanding to a point beyond which they could have gone alone. They often tried to resolve this by reverting to the dominant rules that they were more familiar with and restricting access to the information they had found.

- ***SOLE Rule Providing Relative Freedom and SOLE Rule that a Presentation Must be Given***

A small number of students also experienced conflict stemming from a recognition that the SOLE rules enabled them to legitimately opt out of learning yet not wanting to be seen to have failed to meet expectations. To resolve this, they exploited the rule that students were allowed to change groups at any time by staying with their chosen group and doing as little as they wished for the majority of the SOLE session, then moving groups at the end to ensure that, when the teacher re-entered the room to hear student presentations, they were part of a group that had information to share,

“Prior to teacher returning to the room – with a few minutes to go – the disengaged group [as identified by the teacher] scattered to other groups around the room.” (Observation G)

“the rule that they can actually move groups, so some realised that they can actually start in one group, not do any work there, and then when it looks like their group won’t have anything to show for it at the end, some of them would actually move to a group that they know has done some work and then be part of the group that presents a decent bit of work at the end.” (Teacher 2)

This exploitation of the rules enabled students to resolve a conflict between how they wanted to spend their time during a relatively unsupervised session, and not wanting to be seen to have failed to fulfil the expectation established by the rules. This concern over potentially getting into trouble implies that students recognised that the shift in the division of labour was temporary and confined to the SOLE Room. They were apparently not concerned about whether they learned anything during the session, they simply wanted to be part of a group that had information to present.

6.2.5 Longford School: Rules That Were Operative During SOLE

At Longford School, the use of SOLE was not controlled by any one individual and the teachers who opted to use it were free to appropriate it in different ways. Please refer back to figure 5.6 (p.97) for a graphical representation of the activity system at Longford School. They all took the rules from the SOLE Toolkit (Mitra, 2014a, p.7) as a starting point but, with no monitoring of SOLE use within the school, they adapted these according to their needs and in the context of any conflicts they perceived between SOLE and the wider activity system.

- ***Interpretation of SOLE Rules: the Teachers***

For the majority of teachers at Longford School, the SOLE rules were understood much as they were at Hillside School: a set of procedures that must be followed in order for a SOLE to be deemed to be taking place. As such teachers clearly felt constrained,

“The classroom management was an issue I didn’t like, I didn’t like the fact that I wasn’t allowed to interfere” (Teacher F)

“Well you’re not supposed to influence it right, aren’t you supposed to sit back and see what happens?” (Teacher I)

“it’s quite hard to stand there and just do nothing, I don’t really like that part, it’s so not in the nature of the teacher to just stand and do nothing ... and if someone’s off task I just wanted to go over and be like ‘Right, come on, get on with your work!’ but you’re not supposed to do that, you’re supposed to let them go.” (Teacher V)

The language used by these teachers is significant in that it implies a lack of choice, so they perceived that they must conduct the SOLE in a particular way. No teachers at Longford School suggested that they should be outside of the room completely, and indeed the location of this room would have meant that they had to go outside the building in order to see into the room during a session. Yet the understanding that SOLE was a set of procedures to be followed was strikingly similar to the perception of teachers at Hillside School and this focus on teacher behaviour again seemed to characterise understanding of SOLE.

However, as noted previously, two teachers at Longford School viewed SOLE differently. Rather than a set of procedures, they perceived SOLE to be a set of principles and the SOLE rules to be guidelines that they could adapt as appropriate. One teacher explicitly contradicted the perception of the majority of teachers when he stated that he did not believe Mitra had been prescriptive in how SOLE must be carried out, rather it was appropriate to use any methods that promoted self-organisation (Teacher H). For this teacher, his interpretation of the rules impacted upon his appropriation of SOLE because he believed that, as long as he was adhering to the principles of self-organised learning, as he interpreted them, he could adapt it in any way he chose. Interestingly, this teacher did not perceive there to be a conflict between SOLE and the dominant activity because when he adapted SOLE to ensure that it worked towards the object, he did not perceive himself to be detracting from Mitra’s original concept. He was therefore able to pre-empt any conflict that he might otherwise have felt.

Teacher A also did not feel constrained by the SOLE rules but her justification for adapting SOLE came from a strong belief in her own personal responsibility for ensuring that students made progress during her lessons. For her, that simply outweighed any requirement to be faithful to Mitra’s vision of SOLE,

“our responsibility as a teacher is to ensure that all students make progress, not just the ones who are interested, not just the ones who are keen and motivated. We need to get even the least motivated student in the class to have learned something. And you could argue ‘well if they don’t take part in this bit then ... at least they’ve got the benefit of the debrief’, but is that me doing the best for them that I possibly could do? Or, if I say to them a couple of words like ‘oh, so what’s your group found out?’ as a way of getting them into a discussion about it and getting them back into their work, then I think I have a responsibility, a duty, to do that.” (Teacher A)

Just as with Teacher H, this teacher did not experience conflict between SOLE rules and the object because her interpretation of the former was that they were secondary to the object of the wider activity system and thus she felt confident to adapt them to work more effectively. Although she did not state that SOLE was a set of principles as explicitly as Teacher H, she nevertheless appeared to share this perception that the 'procedures' of SOLE (as other teachers saw them) could be adapted freely so long as the concept of self-organisation remained.

- ***Bespoke SOLE Experiences***

Despite the similarities in teacher understanding of the rules at both schools, appropriation happened very differently at Longford School because teachers were not accountable to anybody for how a SOLE was conducted. Thus, despite the perception that they were constrained by SOLE rules, every teacher observed at Longford School adapted them to some degree. Perhaps inevitably, this meant that the rules that were enforced differed between teachers, resulting in a range of SOLE experiences for students. This contrasted with Hillside School where the fact that teachers were not permitted to be in the room meant student experiences were fairly uniform across every SOLE. At Longford School, teachers essentially created bespoke hybrid rules which combined elements of the NDS of their usual classroom with elements of the SOLE rules as created by Mitra (2014a). This typically manifested as additional rules for students regarding what they could or could not do,

“Teacher introduces an extra rule, that they’re not allowed to read information at the end, they have to talk about what they learned & what they remember.” (Observation 22)

"tells students that [in this session] they can't write on walls because they don't have much time." (Observation 26)

These additional or adapted rules typically represented a shift back towards the teacher's NDS, not least because the very act of imposing a new rule impinged on the freedom that self-organisation theoretically offered to students. These modifications were always an attempt to improve student learning by ensuring that they maximised the time available or by encouraging them to focus on finding information rather than on the elements of the room that were novel, such as having walls that students could write on. They essentially ensured that SOLE would work to support the object by influencing the outcomes that students achieved during the session. However, in reality these rules also created extra layers of expectation for students which might be directly contradicted by another teacher,

"Some students start watching a YouTube video and they start singing. Most of the rest of the class crowd around for a while, but then tend to float away, expect for a few (3-4 students)." (Observation 8)

"Group 2: on YouTube watching a video about their sweet choice. Music comes on and teacher immediately says 'Off that!'" (Observation 26)

Thus, with some teachers it was acceptable to watch videos during SOLE, whereas for others it was not, and students needed to remember to act within the particular parameters created by their different teachers. Just as they learned to act within the NDS required by different teachers in their own classrooms, so they had to learn to adapt their behaviour according to the modified SOLE rules that teachers had.

The combination of school-SOLE rules that operated during SOLE at Longford School also meant that students received conflicting messages regarding appropriate learning behaviour in this context. At times, teachers referred students back to the SOLE rules, encouraging them to move around and share information,

"Students are reminded they can change groups at any time." (Observation 9)

"Teacher 'Have you found anything sociological? That group [indicates] have something interesting.'" (Observation 18)

“As they get started teacher calls out that they should remember that they can move around and share ideas. Some seem to do so.”
(Observation 30)

However, while teachers always gave permission for students to move around and share ideas at the start of a SOLE, the fact that this contrasted with typical teacher behaviour was clear because during the observations there were many missed opportunities where teachers could have encouraged students to operate within the SOLE rules, but instead resorted to their default approach,

“[Teacher] Reads question out, student immediately says ‘Haribo!’ Teacher, ‘Ssh! Keep your answer to yourself!’” (Observation 26)

“moving around between groups didn’t really happen and wasn’t encouraged, although it would have been another way of guiding groups towards Fibonacci [the teacher’s aim]. Instead she told groups they were on the right track.” (Observation 4)

In such instances, teachers reinforced normative classroom rules regarding private knowledge and the teacher as the expert, neither of which were consistent with the assumptions behind SOLE learning. In addition, a willingness to answer student questions directly was regularly evident, ranging from providing correct spellings to giving direct answers in response to student requests for information. Although in theory, teachers being physically present during the SOLE sessions should have enabled them to insist that students acted within the SOLE parameters, in practice very few consistently responded to student questions or queries in a way that reinforced the concept of self-organised learning. The result for students was a very mixed message about the optimal way to behave and learn in this context.

This was exacerbated by the fact that, when they were introducing the SOLE session, most teachers made reference to the SOLE rules, such as students choosing their own groups and being allowed to move around, but this tended to be perfunctory, with no consideration of the impact they might have on learning,

“Teacher states that she knows the students know how SOLE works as she knows they’ve been in before ‘you know how to use the room; you know you work in groups of 4.’” (Observation 17)

“There are instructions on how to work in a SOLE on the PowerPoint but teacher doesn’t go through it, she leaves it up and simply reminds them that they can move between groups.” (Observation 9)

Even in the most detailed example observed, there was little guidance for students about how they should approach learning in this way,

“Teacher, ‘What do you do in here?’ Student, ‘Search stuff on the computers.’ Teacher, ‘And do you work in groups?’ Student, ‘Yes!’ One student says she’s working on her own. Teacher, ‘That’s your choice! Ok, I know you’ve been in here before but I want to make sure that you know what I want you to do. You’re going to answer a question. You will present next lesson; you’re going to feel silly if you don’t have anything!’ Tells them they can present how they want: PowerPoint but not to spend ages making it pretty, should research instead. Or make notes in Word. Tells them the question. Reminds them they can talk to others if they want to.” (Observation 23)

The rules were ostensibly broken down into doing research in order to give a presentation and having permission to talk to other students. It is difficult to distinguish what made this different to any other research task that students might undertake, albeit one with the freedom to work with who they chose. Some teachers did try to articulate the ideas behind the rules in a bit more detail,

“[Teacher] talks about them collaborating to share information and reminds them they shouldn’t just move around talking, they should consider how each bit of information helps their own work.” (Observation 22)

“Up to you how you find an answer to the question, the groups that you work in. Not a competition, you’re all trying to find an answer together.” (Observation 24)

What is striking is that almost all of the instructions given to students focused on how they were behaving rather than how they were learning. There was no attempt to get students to consider the value of ‘trying to find an answer together’ and neither was there any discussion about what effective learning interactions might look or sound like. No observations undertaken for this research featured a discussion about how students might answer a big question or what would constitute a quality, or even acceptable, response to such a question. Where teachers attempted to offer some form of success

criteria regarding student presentations, it was very generic, for example a reminder that students should have evidence for their answers, or an instruction regarding how long each presentation should last. In this way, teachers limited the scope of what students might be able to achieve during SOLE.

Omitting to discuss the purpose of the SOLE rules is likely to have been because teachers lacked understanding of the fact that a different type of learning was required. As a result, they were not actively creating an environment where an alternative form of learning could take place and they were not supporting students to act meaningfully within the SOLE parameters. While this was also true at Hillside School, the fact that individual teachers interpreted the rules differently at Longford School, creating additional layers of expectation, made it more difficult for students to navigate the rules governing their behaviour. Teachers also took greater ownership of the session to ensure that students learned relevant content, to ensure that the SOLE would still have value in terms of an outcome that supported the object of the school activity system.

- ***Interpretation of SOLE Rules: The Students***

Perhaps unsurprisingly, given that the SOLE rules were rarely discussed with students, they did not appear to understand their purpose, therefore they were not typically proactive about operating within the rules in a way that might support their own learning,

“Teacher asks an individual ‘Have you thought about asking another group?’ Student, ‘No...’ Teacher doesn’t push this, she sits with the student and questions her and guides her.” (Observation 7)

“[Social] Issues in some of the groups ... I point out to a group of six boys that they can move if they want to, they just shake their heads, despite one student claiming another has hit him.” (Observation 24)

“At the end of the session, a group of girls complains that one student did nothing all lesson. They didn’t move [groups] though.” (Observation 15)

A lack of understanding of how the SOLE rules might be used to develop their learning appeared to result in other priorities taking precedence for students, such as remaining in a group with their friends. They seemed to recognise

that they had greater freedom in a SOLE, as suggested by the fact that they often sat and talked to their friends once they had an answer to the question, but they typically perceived this as an opportunity to take a more relaxed approach to learning, rather than to learn in a different way.

The purpose of the SOLE rules is to encourage genuine collaboration among students in order to co-author learning. However independent working and an understanding of knowledge as private are generally the norm in secondary schools in England and students did not seem to understand how to participate in genuine collaboration with others. Students were usually observed working alongside each other, rather than developing their learning together,

"[SOLE Question: Could India be the most powerful country in the world?] One group, quite big, and one girl goes through their PowerPoint putting a title on each slide e.g. History of India. When she's done, she says to another student 'Do you want to do the history part now?' (This student seems to have a good, structured approach to formulating an answer. This isn't shared with other groups, or even really in her own group. They seem to be working alongside each other rather than genuinely collaboratively.)" (Observation 34)

"One group appear off task, discussing various unrelated social things. When teacher asks how they're doing they have an answer. It's a percentage and they don't all seem to agree that it's right, but it is an answer, therefore it seems they were only 'off-task' once they were 'finished' in their own minds. (Students stop when they perceive that they have an answer. There appeared to be no interest in digging any deeper, seeing whether they had the same as other groups, checking what they had, or even in persuading all group members to reach consensus.)" (Observation 5)

This lack of understanding about the value of collaboration extended to students failing to take joint ownership over any learning that took place. For many, so long as someone in their group was working, they felt that they were abiding by the SOLE rules. There was no obvious recognition in the SOLEs observed that 'working' and 'learning' might be different. Thus, while students appeared to welcome being in groups with their friends, this did not translate into a shared responsibility for learning,

"[Debrief] Group 5: first thing a student says is 'I know nothing about it and they're going to send me up when I don't know anything.' Teacher, 'is that because you've messed around and done nothing?' Student, 'Yeah'." (Observation 4)

"[Debrief] Student from the presenting group, before they start presenting, says 'I don't even know what they've done!'" (Observation 25)

"[During a discussion with a student about their group's answer] Teacher asks if there are only two races in the UK and student responds, 'Well it wasn't my idea.'" (Observation 30)

The language used by students is telling in that they refer to their groups as 'they' rather than 'we'. This illustrates the widespread lack of understanding about how the SOLE rules could support effective learning and an unwillingness to accept joint responsibility, particularly where they felt the research part of the session had not gone well. This impacted upon the extent to which students engaged in the learning that was on offer. As they typically were not told about the purpose of the rules, or the way that they could learn most effectively in that context, students tended to view SOLE as a more relaxed extension of their usual schooling, rather than an alternative form of learning.

6.2.6 Longford School: Contradictions for Teachers

Teachers experienced conflict in terms of the rules of SOLE because they differed so greatly from the rules that operated within the dominant activity. A contradiction also arose between the rules of SOLE and the object of the wider activity system because teachers were not confident that they could meaningfully work towards the object while simultaneously adhering to the rules as they understood them.

- ***Rules of SOLE and Rules of the Dominant Activity***

Teachers clearly experienced tension between the expectations of student learning and behaviour in SOLE and the expectations of learning and behaviour in their usual lessons; most explicitly acknowledged that they were too used to providing students with answers and assistance and thus struggled to adapt to the very different requirements of SOLE. For some, there was a fear that changing the rules too drastically in this part of the activity system would impact on learning and behaviour throughout the rest of the activity system,

"if I took them over there [the SOLE Room] too many times and let them do whatever it is they do ... I'd be frightened then when I came back in

here [own classroom] that I might have lost some of my control.”
(Teacher J)

Interestingly, this tension did not arise at Hillside School, perhaps because the SOLE Room being part of an adjacent activity system meant that both teachers and students accepted that the rules would be different, or perhaps because the defining rule of the teacher not being present could not be adhered to in their own classrooms. In contrast, teachers at Longford School were concerned about the effect that weak framing in SOLE would have on the rest of their teaching, particularly in terms of student behaviour, and they mediated to negate this impact. Such mediation tended to focus on managing behaviour, presumably so that it was more aligned to the teacher’s NDS, for example,

“Teacher goes to another group for feedback, ‘Sit properly on your chair’.” (Observation 4)

“Occasional instructions, ‘sit up properly on that chair.’ ‘I’ve already told you about the singing.’” (Observation 19)

“Teacher asks the class for quiet while she takes the register. ‘Can whoever’s kicking or banging stop doing that please.’” (Observation 31)

Mediation of learning, behaviour, or both was observed in every SOLE at Longford School to some extent. This appeared to enable teachers to resolve the conflict they experienced between the different rules. Some teachers also resolved this tension by adapting the SOLE rules, even where this directly contradicted Mitra’s (2014a) guidance. In these instances, the adapted rules were invariably about group size, where teachers restricted student freedom of movement,

“He then counts students and says that one other rule is that groups cannot be as big as 6 or 7 people.” (Observation 22)

“Students arrived in the room and were asked to work in the same groups as last time. (Teacher wants continuity and accountability, thus restricts movement between groups.)” (Observation 16)

These restrictions were imposed to resolve the conflicts that teachers experienced when using SOLE and they served to blur the distinction between learning in a SOLE and learning in a typical classroom. However, they did reduce the tension that teachers felt which appeared to make SOLE

use sustainable, as reflected in the SOLE Room booking data presented earlier.

- ***Rules of SOLE and Object of the Activity System***

The SOLE rules also created tension with the object of the activity system, namely educating students as evidenced by them achieving in high stakes tests. For most teachers the pressure deriving from this object resulted in them controlling the content students must learn, not least because they felt constrained by the amount of content to be covered in a set amount of time. This made SOLE use problematic,

“there’s the time constraint, the stuff they need to know, it’s a shame there isn’t a bit more time because there’s so much that they need to know now ... I think it limits the amount you can use it because that constraint with the content, needing to get through that holds you back a bit.” (Teacher T)

“in the SOLE it’s hard with the time. They could do with having more time investigating on their own, but then you do want to bring it all together and have that discussion because you don’t want to leave it for the next lesson because then it’s taking up two lessons, and because there’s so much content to cover you feel like you need your lesson time.” (Teacher G)

In an effort to resolve this conflict, all teachers adapted the SOLE rules by mediating learning during the SOLE to varying extents. For some teachers, this was about continuously challenging them throughout the session to find as much information as possible and to engage with it meaningfully, and for others, it amounted to direct instruction,

“A pair come to share their ideas with the teacher. It has nothing to do with Fibonacci Sequence [teacher’s desired content]. It’s interesting, though based on some false assumptions – teacher asks what sequence it’s based on and student says ‘they’re all different.’ This is not the case with Fibonacci so teacher ends up leading students to a point where they know they need to find out more about the specific sequence.” (Observation 35)

“[SOLE question: If the UK was a sweet, what sweet would it be?] Teacher gets class quiet and reminds them of the question. Asks them about which four countries make up the UK and a student names them. Teacher, ‘Remember your sweet needs to have four layers and you need to justify why each one is each country.’ (Observation 31)

"It's interesting to step back and listen to them but then I still 'oh what do you think about this?' or 'have you looked at that?' I find myself doing that quite a lot." (Teacher T)

In these examples teachers mediated, more or less directly, to guide students towards the desired content for that session in order to resolve the conflict between the object of the activity system and the SOLE rules, which theoretically enabled students to take the learning in any direction they chose. Every observation undertaken included examples of teachers guiding student learning in the direction they required to ensure that the content learned fit the teacher's intended outcome. This appeared to make SOLE use more sustainable at Longford School, although for the majority of teachers it was still sporadic.

6.2.7 Longford School: Contradictions for Students

Students did not appear to experience much conflict pertaining to the SOLE rules at Longford School. This is presumably because teachers mediated the SOLE rules to bring them more into line with their usual classroom rules, thus the clash between the two was less extreme than at Hillside School. Nevertheless, some students did experience limited conflict between the rules of the wider activity system and the rules of SOLE, specifically the concept of learning being co-authored, as opposed to private. In addition, a very small number of students experienced conflict within the SOLE rules themselves in terms of the freedom they had to regulate their own behaviour and the expectation that they would give a presentation at the end of the session.

- ***Rules of SOLE and Rules of the Dominant Activity***

For the vast majority of the SOLE sessions observed, students defaulted to their usual approach to learning. This included worked in fairly static groups and believing that the information they found was their own private acquisition,

"Teacher pointed out they could have moved around during the session to look at other people's ideas. Student, 'That's copying!' Teacher, 'No, that's sharing information.'" (Observation 30)

"No, I don't think they do that enough, the moving around, or they say 'such and such is copying, they've stolen that idea off us!' So, I think they tend to stay, with them choosing their groups they tend to stay [there]," (Teacher T)

"A group calls teacher over 'Miss, we're done!' Then to another member of the group, while covering their answer, 'Don't let anyone else see...'" (Observation 33)

"One group are a little stuck, teacher is with them and suggests that they ask another group what they've got because they've looked at it already. The members of the group she's directing them to don't seem keen 'No!' The suggestion is that it's 'their' work. Teacher, 'You can share ideas you know; they might have some of the answers you're looking for.'" (Observation 7)

Thus, even where teachers tried to encourage students to operate within the SOLE rules, rather than those of the dominant activity, students were reluctant to do so because this created conflict with the rules that they were accustomed to. They appeared to follow the example of their teachers by hybridising the rules so that they typically worked within the rules of the dominant activity, but on occasion and with encouragement, they would try to follow some of the SOLE rules such as moving around to share information. Relatively few efforts were made by students to really explore the opportunities afforded by the SOLE rules in order to learn as effectively and efficiently as possible. As discussed previously, it seems clear that students had little understanding of how they might do that.

- ***SOLE Rule Providing Relative Freedom and SOLE Rule that a Presentation Must be Given***

A small number of students experienced a similar conflict to that at Hillside School whereby they wanted to take advantage of the relative freedom they had in SOLE, compared to their usual classrooms, but wanted to appear to meet the expectation that they would present their findings at the end. They recognised that this conflict could be resolved by exploiting the rules, just as had happened at Hillside School,

"Just as teacher announces 'it's debrief time', all students from Group 3 leave for other groups except one. Group 1 student, 'Miss, he can't just join us, now can he? Right at the end?!'" (Observation 30)

This adaptation of the SOLE rules enabled students to opt out of the collaborative, co-authored nature of the learning with which they were unfamiliar while also evading any consequence from the teacher for failing to meet the main SOLE expectation. This was the only observed example of such behaviour at Longford School and it was not mentioned by any teachers in their interviews, which suggests it was not a common feature of SOLE there. This is likely to be because teacher mediation resulted in fewer groups reaching the end of the research part without having found any information. It is also likely that the stronger framing that prevailed at Longford School made students wary of openly defying the teacher's requirements and less confident that they would be permitted to abdicate responsibility in this way. Although this was the only extreme example observed, many students found ways to opt out of learning for varying amounts of time during SOLE, just doing enough to produce an answer for the end,

"One group were giggling, playing with each other's hair etc, though had a relevant website up" (Observation 3)

"in one group students are watching videos which seem unrelated." (Observation 5)

"Group 4: just 1 or 2 students involved and interacting [with the question], the other 4 or 5 are sitting on the floor talking, some with their backs to the computer." (Observation 20)

Thus, students were able to find a balance between the SOLE rule that allowed them freedom to opt out of learning if they chose and the SOLE rule that their group must share information during the debrief. In the observations conducted, this sporadic engagement was the default approach to SOLE by most students at Longford School.

6.2.8 Comparative Summary of how the Rules Impacted Upon Appropriation

The understanding that SOLE was a set of rules, or procedures, to be followed was strikingly similar in both schools and this focus on teacher behaviour seemed to characterise understanding of what a SOLE was. All teachers at Hillside School and the majority at Longford School interpreted the SOLE rules as constraining teacher behaviour. Just two teachers at Longford School viewed the rules differently, interpreting them instead as principles of self-organisation within which the practicalities of how to organise a session

were flexible. It is interesting that these two teachers were among the most regular users of SOLE at either school.

Despite similarities in most teachers' understanding of the rules, appropriation happened very differently in the two contexts and this should be understood in conjunction with the division of labour that existed within each activity system, which will be discussed in the following section. At Hillside School, SOLE existed within a separate activity system and the rules were imposed upon teachers by Emily, rather than defined or constructed by them. The rule that teachers should not be present for the majority of the SOLE session came to define SOLE use in that context. In contrast, at Longford School there was no central monitoring of SOLE use and little discussion of how it should be done, thus although their interpretation of the rules tended to be similar to teachers at Hillside School, they also had the freedom to adapt those rules. Those adaptations resulted in a wide range of rules being enacted which combined Mitra's (2014a) SOLE rules with the school rules and a teacher's NDS. Perhaps inevitably, the rules enforced differed between teachers which created a variety of, sometimes contradictory, SOLE experiences for students, unlike Hillside School where the fact that teachers were not permitted to be in the room meant that there was a ubiquity to students' SOLE experiences. The only variation at Hillside School, which brought it more in line with the rules that operated at Longford School, occurred when the teacher posed the question at the start of SOLE and during the debrief. At both schools, the rules appeared to offer students more freedom than their typical classrooms, however this was to a far greater extent at Hillside School. During SOLEs at Hillside School, teachers often tried to remind students to operate in accordance with the SOLE rules, whereas at Longford School teachers were far more likely to resort to their default role of mediating, even controlling, both learning and behaviour.

There appeared to be a lack of understanding among most teachers of the purpose of the rules and how they might facilitate learning. Teachers rarely discussed them explicitly with students in either school, which meant that a lack of understanding was also evident amongst students. At neither school was SOLE characterised by students moving between groups and there was

often a clear reluctance to share information with others. At Hillside School, where teachers were less able to monitor what students were doing, behaviour that was arguably more in line with the SOLE ideal was often considered to reflect disengagement from the SOLE process. Only Emily suggested that judgements about engagement or behaviour were not valid during SOLE.

At both schools, teachers experienced similar conflicts between the rules of SOLE and both the rules and object of the dominant or neighbouring activity. At Longford School teachers resolved this by adapting the rules to allow varying degrees of mediation and this appeared to be sufficient to sustain irregular SOLE use in this context. It was not possible for teachers at Hillside School to resolve conflict in the same way due to the division of labour that existed there; this will be explored further in the next section. As a result, teachers typically opted not to use SOLE at all and this was reflected in the SOLE Room booking data. Interestingly, despite the significant differences in the SOLE rules as they were appropriated at each school, the conflicts that teachers experienced were very similar. However, the lack of control that teachers at Hillside School had over the SOLE process resulted in very little opportunity for them to resolve conflict, whereas there was evidence of this occurring at Longford School.

Students at both schools appeared to experience conflict between the rules of SOLE and their usual school rules, particularly in terms of the differing approaches to knowledge ownership, and they often had to be reminded that sharing information was appropriate in this context. Despite the greater freedom on offer to students, at both schools they tended to conform loosely to the rules and NDS of the traditional activity. At Longford School this hybrid of the rules was created and enforced by the teachers, whilst at Hillside School students enforced some elements of their usual classroom rules themselves. This might reflect attempts to engage in learning, or it might be evidence that students recognised the temporary nature of the shift in power and thus felt that satisfying teacher expectations was still appropriate. Students were often observed adjusting their own behaviour if they were aware of someone watching. In both schools, some students appeared to

experience a tension between the SOLE rule that students were free to self-organise and the rule that they had to present their learning at the end. They resolved this by exploiting one of the SOLE rules and moving into a new group just before the presentations had to be given. This was only observed once at Longford School, where teacher presence and mediation made it difficult for students to do little throughout the session. It appeared to be more common at Hillside School, where students had greater freedom during SOLE.

6.2.9 Conclusion

In this section I have discussed my findings in relation to the rules that were operative in each school during SOLE use. I have considered how the different interpretations of the SOLE rules shaped appropriation in each context, from both teacher and student perspectives. I have identified some similarities between the ways that the rules were understood in each school and a number of differences regarding their application. I have also discussed the contradictions that arose at each school as a result of the differences between the SOLE rules and the rules of the dominant or neighbouring activity, as well as those pertaining to the object of the education activity system. In the next section, I will discuss the division of labour that was apparent during SOLE in each school and consider the implications of this for appropriation.

6.3 How Did the Division of Labour Manifest During SOLE and What Impact Did This Have on Appropriation?

6.3.1 Introduction

This section aims to describe the division of labour that manifested during SOLE at each school, based on the data gathered from teacher interviews and SOLE observations. The schools will be considered separately to identify the specific division of labour that emerged in each context and to explore the impact of that on SOLE appropriation. This section will conclude with a brief comparison of the division of labour during SOLE in each school to highlight similarities and differences between the two cases.

6.3.2 Hillside School: Division of Labour

The headteacher of Hillside School recognised that in order to use SOLE, a climate needed to exist within which teachers felt able to take risks,

“it does need that permission that you’re going to use that, the permissions that it may be that on some occasions there’s really fantastic learning going on but it’s not going to contribute to anything that’s in your curriculum because it’s come from the side and that’s fine. So, you have to be aware of that risk.” (Headteacher)

Teacher 6 did explicitly state that, although there was a risk that she might spend a lesson on content that was not relevant to the curriculum, the senior leadership in the school valued that risk-taking over the possibility of one lesson not going how she wanted it to (Teacher 6). However, it was also evident that while permission to use SOLE was granted, even where there was a risk attached, permission to experiment with the format of SOLE was withheld.

- ***Whole School Level: SOLE is Located in the Arts Centre Activity System***

SOLE was introduced to Hillside School by Emily, who contacted Mitra directly and begin working with him to develop SOLE for secondary school use. Please refer back to figure 5.5 (p.96) for a graphical representation of the neighbouring activity systems at Hillside School. The headteacher explained that the decision to locate SOLE physically within Emily’s space, the Arts Centre, seemed logical,

“[Emily] was involved in that process from the start so it was a natural progression, she’s been there right the way through.” (Headteacher)

As noted previously, this decision had significant repercussions because, intentionally or otherwise, it effectively put Emily in control of the SOLE process. The headteacher acknowledged the significance of this,

“[Emily had] a lot of contact with the staff, a lot of ability to carry things through on a more casual basis than if it was led by a member of the teaching staff who was rushing themselves, so there’s that opportunity to kind of ‘well where are we taking this next?’ and all those sorts of things. But I think she has made a fundamental difference and contributed to the success and the reflection I think in terms of SOLE” (Headteacher)

Emily had a very specific understanding of how SOLE should be appropriated, based on her understanding of how it could be most effective, and recognised that she was in a position to influence that,

“the risk is, in a school, that if there’s not somebody sort of developing it, you end up potentially where people have tried a little tiny bit here ... without really taking consideration of the principles ... and then it starts to dilute ... and you can’t control how people deliver things. But I can. I am in a position to model it, to encourage it, to support it, to influence it, to shape it, to develop it, to bring people in, to take people out, to work with people to build the questions – there’s a lot of investment of my time and energy, personally as well as professionally, gone into that to make things happen.” (Emily)

From Emily’s perspective, any hybridisation risked losing the elements that made SOLE different and worthwhile and the headteacher appeared to fully support this approach to appropriation. Thus, once Emily had shared her interpretation of Mitra’s principles with teachers, that format became the appropriate way for SOLE to be done and, because SOLEs only took place within the Arts Centre, it was possible for Emily to encourage adherence to this ideal. Her authority was granted by the headteacher, who shared her vision.

- ***SOLE in the SOLE Room: Power Shifting Away From Teachers***

In effect, as soon as a teacher decided to take a class to the SOLE Room, Emily’s influence was apparent. The room could only be booked through the Arts Centre and, as noted previously, the big question had to be submitted for approval prior to the SOLE. Once the session was underway, Emily ensured that teachers remained outside the room, other than to pose the question and to manage the debrief at the end. On occasions she was also observed advising teachers about what to do while the session was taking place,

“Ten minutes before the end [Emily] comes out of her office to ask if there’s only ten minutes of the lesson left, should they be feeding back now?” (Observation A)

Thus, Emily was able to impact upon teacher behaviour at all stages of the SOLE process.

Although this insistence on adherence to one particular vision of SOLE was arguably limiting for teachers, Emily’s availability to support SOLE use was

also valued by the headteacher because it offered opportunities for training and development of teachers,

“The staff have got that ability to withdraw and then sit on the sofas and be supported by people, so it becomes quite a support package so they feel ‘yeah, these are the principles, I can now take this somewhere else”
(Headteacher)

This reflected the shared object of SOLE that the headteacher and Emily were working towards. Although there was no flexibility in how SOLE should be used, Emily was clear that she did not tell people what to do, instead she took a modelling and coaching approach which supported teachers through what was often a difficult transition between their classroom and the SOLE Room,

“I’ve done a lot of modelling. I mainly delivered the sessions to start with, with the teacher, not so that they copy me entirely but to set the scene ... so I think some of the modelling has helped and a lot of the conversations we’ve had sat on the sofa outside have been really helpful and me kind of asking questions and then reflecting – I suppose it’s coaching in a sense – reflecting back on what it is they’ve said or found interesting and then them going off with that and doing something with it.” (Emily)

Thus, while teachers had no power to influence how a SOLE should be conducted, they were nevertheless part of a supportive and developmental process and while this appeared to prioritise the integrity of SOLE above teacher professional judgement, it also existed as part of a wider approach to changing teaching and learning across the neighbouring activity system. A lot of time and thought was put into ensuring that teachers did not feel isolated and this was significant in making it possible for SOLE to be appropriated in a way that went so far against the everyday norms of schooling.

- ***SOLE in the SOLE Room: Power Shifting to Students***

While the division of labour involved an extreme shift from the teacher being in control to Emily being in control, this ideal form of SOLE ensured the integrity of the self-organising approach. Emily did not retain control over the SOLE once it was underway, rather she ensured that it was passed to the students and she fiercely protected their right to self-organise by taking away the teacher’s authority to intervene. At Hillside School there were no caveats to the rules regarding teachers retaining the right to get involved if necessary, as were common at Longford School, rather students were given

true ownership of the SOLE process until the debrief itself began. Therefore, Emily effectively redistributed power from the teacher to the students and she was adamant that students should be free to do what they chose because they would engage in this type of learning very differently to learning in their usual classroom,

“I’m not really looking at what’s happening after I’ve asked the question and before I go in for the feedback because, to me, that’s about behaviour and I think that’s really valid to keep an eye on that, but ... I don’t think engagement looks the same in a SOLE as it would elsewhere”
(Emily)

By keeping teachers out of the room, Emily prevented them from using the lens of their usual NDS, which she considered to be irrelevant to what happened during a SOLE, to justify disrupting student self-organisation. Her authority in this activity system therefore enabled her to temporarily change the relationship between teacher and students by weakening the position of the former and strengthening that of the latter.

- ***Students in Control: Student Perspectives***

Students were undoubtedly aware of this shift in framing and some were prepared to exploit the strong position they had acquired. The most extreme example of this occurred in an observation where a teacher was convinced that some students were deliberately taunting her,

“Teacher observes that one group of students are drawing a lightning bolt. Then they are using Facetime. Then later they have a sheet with Eminem on it in big letters which both teacher and teaching assistant agree is deliberately large to show them that they can do what they please ... Teacher says she’s surprised that they haven’t typed ‘ha-ha, you can’t do anything!’ on their screen. She describes them as smug because they know she can’t do anything – when she looks at them, they smile and wave. Teacher, ‘I don’t know if I’m allowed to speak to them about that afterwards? You’re not meant to, are you?’” (Observation G)

This apparent refusal to engage with the question asked and to show the teacher what they were doing suggested that the students had a strong sense of how the power dynamic had shifted in their favour. The fact that the teacher questioned whether she could follow up on this incident outside of the SOLE Room showed how emphatic the change in the division of labour was. Interestingly, at the end of the SOLE these students all scattered to

different groups before the debrief began, showing a clear understanding of how the rules could be exploited to allow them to opt out of learning.

Another interesting consequence of the changed power structure during SOLE was the potential it had to make students feel vulnerable. Classrooms are typically safe spaces for students because the division of labour is weighted strongly in favour of the teacher and so there is a central authority figure who can be appealed to where students feel intimidated or unsafe. While students in the SOLE Room at Hillside School were always supervised by at least one member of staff sitting outside the room watching them, and thus were always safe, nevertheless the changed power dynamic resulted in a greater potential for students to feel vulnerable. A teaching assistant, whose work predominantly involved supporting more vulnerable students, articulated this,

“Teaching assistant observes that it must be horrible for some students to be in a school environment and put into a room with no supervision because of students with a bullying nature. Reflects that she would have hated that with some groups at her [own] school.” (Observation G)

Clearly, students could leave the room and speak to the teacher if any serious incidents arose, but where low level issues occurred, particularly those involving groups of friends, it is conceivable that students might have been reluctant to take the very visible measure of leaving the room to speak to the teacher. There were instances where students were potentially vulnerable during the SOLEs observed,

“One student ended up working alone and he said that he hadn’t been able to find any [information]” (Observation D)

“[When the cover supervisor entered the room for the debrief] One student offers the cover supervisor a £5 note. She responds ‘It’s not yours is it?! Isn’t it [student X’s]?’ The other student agrees it’s not his. Cover supervisor ‘Right then.’” (Observation F)

“A student comes outside saying that his group don’t want him to work with them and no other groups want him either. [After he has returned to the SOLE Room] He comes out again a few minutes later and asks to use the toilet. Permission given. Another student comes out almost immediately after to ask the same and is asked to wait until the first student returns. Sometime later the first student hasn’t returned and the second student comes to ask if he can use the toilet yet. Permission given. He returns very shortly after with the first student in tow.” (Observation G)

In all of the above examples there is the possibility that students have been made to feel uncomfortable or unhappy by their peers. The first student may have chosen to work alone, or may have been forced to because other students refused to work with them. The second student may have been messing around with a friend or they may have taken it from another student who struggled to get it back without adult intervention. The third student clearly had social issues within their group and these may have been resolved or the student may have avoided going back into a space where students were upsetting them. It is difficult to know the exact circumstances of each of these incidents because there were no adults present to witness what students said to each other. While there are other times across a school day where students are not closely supervised, such as break and lunch times, a notable difference with SOLE was that students had to remain in the room; they could not choose to walk away if they wanted to. Their only recourse was to leave the room and speak to the teacher which might be an option that students were reluctant to take. Thus, the shift in the division of labour at Hillside School certainly offered students significantly more control over their own learning and behaviour, however it may have created an environment where some felt more vulnerable than they would in their usual classrooms.

6.3.3 Hillside School: Contradictions for Teachers

The changed division of labour created some conflict for teachers at Hillside School. Firstly, there was tension between the division of labour imposed upon teachers by SOLE and the object of the neighbouring school activity system. Secondly, there was conflict between the division of labour in the school activity system and the division of labour in SOLE which impacted upon teacher identity.

- ***Division of Labour in SOLE and Object of School Activity System***

The Hillside School activity system located responsibility for student learning with the teacher by holding them accountable for achieving the object of that activity system, namely students passing high stakes tests. As has already been established, teachers perceived that this responsibility put pressure on them and suggested that SOLE was not suited to working towards that object.

However, in the neighbouring activity system in which SOLE was located, the division of labour gave students a high degree of control over their learning. This shift was sufficiently extreme that they could choose to opt out of learning altogether, for example by not engaging with the question during the main part of the SOLE and then moving into another group before the final debrief began. Although teachers recognised that they had permission to use SOLE, even where that might lead to students not covering content from the curriculum, this did not translate into reduced accountability within the school system. Therefore, they were required to cover any content missed at another time.

Teachers resolved this conflict by opting out of SOLE use in a variety of ways. As previously mentioned, all teachers chose not to use SOLE with year groups who were closest to taking high stakes tests; SOLE Room usage data showed that no Year 11 classes were booked into the SOLE Room during the data collection period. Teachers also carefully chose which groups they took to the SOLE Room based on the extent to which they believed they would engage with the process,

“So, there are classes that I do think ‘hmmm’ and I haven’t maybe risked [using] it, but that’s not necessarily to do with the ability or the year it’s just my personal feelings about what sort of response I would get from that particular group of students.” (Teacher 6)

All such attempts to resolve this contradiction effectively reduced the scope of SOLE use. For many teachers, another way to resolve this conflict was to stop using SOLE for the subjects for which they were accountable, those in which there would be high stakes tests, and instead to use SOLE for the school’s program of enrichment lessons, called Time for Success. Not only did this enrichment program lend itself to a SOLE approach, it also sat outside the accountability system of high stakes testing. As such, it gave teachers more freedom to experiment and less reason to fear the loss of control over what students learned in a lesson. SOLE Room usage data showed that, during the data collection period, eight of the thirty-three SOLEs that were booked with secondary school classes were booked for use with Time for Success groups. Thus, teachers were able to resolve the conflict between the

accountability deriving from the object of the school activity system and the shift in power to students they experienced during SOLE.

- ***Division of Labour in School Activity System and Division of Labour in SOLE***

Within the school activity system, teachers were responsible for providing students with knowledge and facilitating their learning. Indeed, it seems likely that this formed part of their identity. Once they moved into the neighbouring activity system to conduct a SOLE, they tended to experience conflict regarding the changed division of labour because they perceived that they were no longer required, or even permitted, to act to support student learning. The headteacher recognised this, referring to the “trauma” that staff felt when sitting outside the SOLE Room (Headteacher). Teachers found it particularly difficult not to support or guide students and to sit back if students did not appear to be focused on the learning,

“It’s very hard work sitting outside and being aware of people being off task in the classroom and feeling that you can’t intervene and can’t actually get involved where if it was in your classroom you’d step in straight away.” (Teacher 2)

“I’m here [in school] to help you so you can learn something, but now [in SOLE] I’m telling you to go away and do it for yourself, so yeah that was quite an interesting experience.” (Teacher 7)

“I think it’s strange for teachers because naturally we want to butt in all the time, naturally we’re like ‘well you’re not doing this’ and ‘what do you mean by that?’ and it’s difficult then for us to take a step back and to not go in and say ‘right, can you just put that down and get on?’ And I think that’s a frustration, but we need training in it as much as students do. I think our role probably is a bit of a grey area but it is about taking that step back.” (Teacher 9)

This lack of clarity about the teacher’s role created conflict, yet there did not appear to be an alternative role available for them; they became part of the community component of the Arts Centre activity system while Emily became the subject. The specific form that SOLE took at Hillside School essentially created a vacuum where the teacher’s role might have existed because they had to defer to Emily’s purist vision of SOLE and thus they were not permitted to encourage, guide or facilitate learning for the majority of a SOLE session. It would seem that the only way teachers were able to resolve this

conflict was by not using the SOLE Room; most teachers rarely, if ever, used SOLE and this was reflected in the data relating to SOLE Room usage.

6.3.4 Hillside School: Contradictions for Students

For students, the changed division of labour during SOLE created conflict with the division of labour that they were typically used to in school. While the teacher's absence from the room was a physical manifestation of the redistribution of power that took place, students appeared to want support to ensure that they achieved what was expected of them, as well as being unsure about how far their own wishes actually took precedence over the teacher's NDS.

- ***Division of Labour in SOLE and Division of Labour in School Activity System***

The changed division of labour created conflict for students at Hillside School because, without a teacher there to guide them, they were unsure how to be successful in the SOLE and which rules they should follow. Thus, for students there was much uncertainty about the extent to which the division of labour in SOLE took precedence over the division of labour in the wider school system and they attempted to resolve this by renegotiating control back towards the teacher. For example, there were numerous instances of students asking for assistance or clarification,

"One student comes outside to say that they can't find any information and need some help." (Observation A)

"One [student] comes outside to ask if they should be writing something down, eg in Word, and is told it's up to them." (Observation D)

These attempts to enlist teacher support or clarification of what was required suggested that students wanted to succeed in SOLE but they were unsure how. At other times, there appeared to be genuine doubt over the extent to which students were really in control, specifically whether their own wishes took precedence over the teacher's NDS,

"A student came outside to ask whether they were allowed to take their blazers off." (Observation E)

"A student comes out to ask if they can use the toilet." (Observation F)

*"A student comes to ask if they can research on their phones."
(Observation G)*

These were clear attempts to move the teacher back into their usual authoritative position and again, it seemed that students were keen to do what was expected of them, but they were not sure how far the shift in the division of labour extended. At times, students also wanted the teacher to help resolve issues with peers arising from the collaborative nature of SOLE,

"they took about 15 minutes to stop coming to the door to say 'Miss, they're not doing. Miss!' I said 'pretend I'm almost not here, you need to go in and you need to go and sort it out,' ... and some classes find it much more difficult ... to not want to come to me and say 'well they're not doing this, what shall I do?'" (Teacher 2)

It seems reasonable to suggest that it would be difficult for students to resolve issues within their groups by themselves as they did not have any authority to insist that their peers participated or took an active role. Effective collaboration in SOLE depended upon all students being willing and able to work together, without any teacher mediation, but this was problematic for some and their attempts to involve the teacher in resolving such issues suggests that students did not always feel empowered by the greater control they gained during SOLE sessions.

During my observations, where students wanted clarification about the learning or help with social conflict, teachers typically passed responsibility back to them and encouraged them to act within SOLE parameters. However, where students were unclear about the extent to which the changed division of labour entitled them to break the teacher's NDS, for example regarding their clothing or listening to music, the teachers usually gave or withheld permission, just as they would in their own classrooms. Thus, the changed division of labour arising from the way in which Hillside School appropriated SOLE was problematic for students who experienced conflict because the division of labour was so different to that of the school system and they were unsure which took precedence. They tried to resolve this by renegotiating the division of labour back into the teacher's favour which, strong framing being the norm, presumably made them feel more comfortable.

6.3.5 Longford School: Division of Labour

SOLE was introduced to Longford School by the headteacher who subsequently accepted Mitra's offer of developing a dedicated SOLE Room there. This was deliberately located within the Design Department, the leader of which had been one of the earliest advocates of SOLE in the school, and who had initially made contact with Mitra. The SOLE Room therefore became nominally the responsibility of the Curriculum Leader for Design; however, the concept of SOLE was never perceived to belong to one individual. This was partly because a number of teachers had been experimenting with SOLE in their classrooms prior to the SOLE Room opening and partly because the Curriculum Leader for Design had neither the time or the authority to impose a particular way of doing SOLE onto teachers from other curriculum areas. Please refer back to figure 5.6 (p.97) for a graphical representation of the activity system at Longford School.

This shared ownership had taken on a physical manifestation when another curriculum leader in the school refurbished one of the classrooms in his department to make it into a 'SOLE Sanctuary' even before Mitra's SOLE Room was built, see figure 6.1. This room had been designed specifically to accommodate a range of activities and, while it incorporated many of the features of Mitra's ideal SOLE environment (2014a), it was intended to be adaptable. Thus, not only did this room represent the possibility of adapting SOLE from Mitra's original concept, it also existed as a symbol of collective ownership as there was not a single location where SOLE had to be done, and there was no one individual responsible for developing it. In addition, even once Mitra's SOLE Room was built, teachers stated in their interviews that they still conducted SOLEs in their classrooms at times (for example Teachers A and B), which reinforced the notion that SOLE could be conducted in a variety of ways. The headteacher was enthusiastic about the proactive approach that his teachers took towards adapting SOLE and fully supported the development of a separate, multi-purpose SOLE space.



Figure 6.1 Teacher-created multipurpose SOLE Room

- **Whole School: Shared Ownership of SOLE in a Culture of Experimentation and Teacher Autonomy**

A culture of experimentation was important to the headteacher so that teachers could try out any strategies they wished,

“I like that we’re a school where people feel comfortable to try things out, to try different things, to try different strategies ... I’ve never wanted to work in a school whereby it’s a one size fits all approach; I think that’s just wrong” (Headteacher)

Like at Hillside School, teachers were not obligated to try SOLE and the room booking data shows that not every teacher, or even every department, used the SOLE Room during the data collection period.

Not only did the headteacher encourage experimentation in a general way, he also questioned the particulars of SOLE itself, which gave teachers permission to do the same. Specifically, he questioned the idea of minimising teacher involvement in SOLE, which had been a central feature of SOLE appropriation at Hillside School, arguing that having a teacher present to mediate would enhance the learning experience,

"I've always struggled with the concept of you shouldn't even have a teacher in the room ... I just think there has to be a role for a teacher within it ... you're trying to challenge their thinking to make it better because kids are bright, kids are brilliant and the thirst for knowledge is there, but what's not inherently I think is that understanding or ability to challenge themselves ... It's that whole idea of having somebody in the room to just prod a bit further and say 'well what if you did that?' or 'are you sure about that?'" (Headteacher)

This questioning of SOLE left space for doubt about how it might work most effectively and encouraged reflection upon what teachers could do to develop it further as a strategy. Indeed, the headteacher was very clear that teachers were the experts and they should decide how SOLE might be appropriated most effectively,

"[I: Do you think there's a right way to do SOLE?] I don't know. I don't teach and the less I've taught and the longer it's been since I've taught, I really struggle with that actually. I feel quite deskilled in that aspect, so never having delivered a SOLE I don't feel very qualified to answer that to be honest." (Headteacher)

The headteacher was reflective about his own expertise and valued the professionalism of his teachers. He believed that they were the people most capable of identifying what students required and, as such, he trusted their judgement above either his own or Mitra's. The responsibility for SOLE being an effective learning experience therefore rested firmly with the teachers and the climate which made experimentation possible extended to adapting it where appropriate.

- ***SOLE Room: Weakened Framing***

Every SOLE observed at Longford School began with the posing of a question and reserved the majority of teaching time for students to collaborate to find an answer. It was therefore inevitable that SOLE sessions were relatively weakly framed compared to more traditional lessons, in terms of students having more responsibility and autonomy over their learning and teachers taking a step back. Even though there was always some adaptation of the rules which saw teachers limiting students' capacity for self-organisation, as explored in the last section, teachers suggested that the experience was nevertheless liberating for students in comparison to their usual classroom routines,

“it is them working together to come to an answer and whilst the teacher might still be there, might go round and chat to them ... it’s not the teacher saying – which it might be if they were doing research on a computer – ‘oh I think this web page isn’t particularly good, why don’t you go back, why don’t you look at this, oh this person’s found this’. You know, it’s about them.” (Teacher A)

“when students are doing the work in lessons or maybe sharing ideas or formulating arguments, whatever it is, I might go over and see what they’ve come up with and question them more so than I would do in a SOLE. I’m happier to let kids, if you like, make their own mistakes or to bowl along in SOLE than I am in lessons in class.” (Teacher B)

“two or three of them didn’t really do anything [during the SOLE], I think they got nothing in three lessons whereas had I been doing that in a traditional environment they wouldn’t have been allowed to get away with that,” (Teacher I)

Thus, the overwhelming perception of teachers was that a significant degree of responsibility was given to students and that they had much greater freedom to both learn and (mis)behave than in their usual classroom. This shift in the division of labour was reinforced by students, for example some were overheard suggesting that they did not have to ‘do work’ in the SOLE Room (Observations 1 and 30).

Despite this, it was clear throughout the vast majority of SOLEs observed that the shift in the division of labour was superficial and teachers were ultimately in control. They regularly reinforced the message that student freedom in SOLE was bestowed by them and could therefore be taken away if students did not respond in a manner that they considered appropriate,

“To some general disengagement she [teacher] reminds them that they can be sent back to the room to work from books if they don’t behave appropriately here.” (Observation 6)

“Teacher asks class to stop working and listen. It takes a little while; she reminds them that it’s break time next and they don’t want to overrun.” (Observation 19)

“[During debrief] Teacher sends three students out for not listening.” (Observation 33)

“Teacher gets the ‘rules’ PowerPoint on the projector ... second section of text asks students to imagine that the teacher is not in the room ... At the bottom, in red, it notes that the teacher can still address behavioural / safety issues.” (Observation 21)

Even when teachers were clarifying that they were going to step back and give responsibility to students, they included caveats which gave them scope

to intervene at any point they deemed appropriate. When students were not learning or behaving in a way that the teacher was happy with, they could be removed from the room or were reminded that the teacher had the power to take away their free time. In this way, the self-organising that was truly available to students was greatly reduced in comparison to Hillside School because a teacher-defined expectation of what engagement looked like was enforced. Indeed, it is difficult to argue that students gained any real power during some SOLEs because teacher mediation invariably had the effect of limiting student behaviour to that which loosely replicated the NDS of their usual classroom. Hence, SOLE was typically more weakly framed than the majority of students' schooling but the ownership given to students varied greatly, depending on the expectations of the individual teacher.

6.3.6 Longford School: Contradictions for Teachers

The changed division of labour created a significant conflict for teachers between the division of labour they felt compelled to conform to in SOLE and the object of the wider school activity system.

- ***Division of Labour in SOLE and Object of Activity System***

In SOLE there was a shift in framing to give greater responsibility and control to students. However, within the wider activity system there remained a very dominant pressure on teachers to be accountable for student learning, particularly as measured by high stakes testing, which was the object of that system. Teachers were acutely aware of this pressure and how it impacted on the choices they made regarding teaching and learning in general, and SOLE in particular,

"the problem we've got with exam courses is, you know, there is a lot of content to get through and we are ultimately governed by assessment – assessed work – whether that be coursework or exams, so I think the opportunities [for using SOLE] are less for those reasons." (Teacher B)

"So, the students, they found out an awful lot ... but if you put that in an exam context most of that knowledge would be completely useless; that's maybe not the SOLEs fault, it's maybe the exam's fault. But the fact of the matter is that I wouldn't go and take a Key Stage 4 class and do SOLE lessons with them for a week because I don't think they'd get what they need out of it in terms of the exam and I think it would be a big risk to do that regularly with exam classes, with the exams set up the way they are and asking them the questions that they do." (Teacher I)

The object was effectively imposed on schools by the activity system at a national level and therefore teachers were not able to change it. Instead, they resolved this conflict by reducing the scope of SOLE use, just as they had at Hillside School. SOLE Room usage data showed that SOLE was rarely used with students in Year 11 who were close to high stakes testing; only two of the 148 sessions where a year group was identified in the booking were with Year 11. Similarly, teachers were more likely to take classes to the SOLE Room in the final half term of the year, when high stakes testing had finished and thus the most pressured time of the school year was over; fifty-six of the 191 sessions took place in that time period which accounted for approximately one sixth of the academic year. Just as they had at Hillside School, some teachers also suggested that they would not use SOLE with all classes,

“I choose the classes that I take there very carefully, I wouldn’t necessarily feel comfortable taking a class that I didn’t know very well,”
(Teacher C)

By selecting classes, they believed would work well in the SOLE, teachers thus reduced the risk of having a lesson where students would not achieve the outcomes they required. Hence, the conflict between the changed division of labour required by SOLE and the object of the activity system reduced the scope of SOLE use at Longford School. However, this effect was less pronounced than it appeared to be at Hillside School and a far greater number of SOLEs still took place throughout the data collection period. This is likely to be because the division of labour in SOLE remained in the teacher’s favour because of the different way in which it was appropriated. As a result, teachers intervened with students to either refocus them or to question and challenge them to push their learning towards the desired content.

One other resolution to this conflict that was evident at Longford School was the use by a number of teachers of a ‘police person’, specifically a student who monitored learning and behaviour and intervened on the teacher’s behalf. This strategy had been included in Mitra’s early version of SOLE as a means of teachers stepping back from interacting with students while keeping a channel of communication open, the idea being that only the police

person could speak to, or be spoken to by, the teacher. Eleven of the thirty-six SOLEs observed at Longford School made use of a police person and this appeared to act as an effective way of resolving the tension that teachers felt between the changed division of labour and the wider object, without breaking the 'rules' as they perceived them. In theory this person would be able to take on the role vacated by the teacher by mediating learning and helping to manage behaviour where students became unfocused,

"Teacher calls police person over and asks him what the role is. He [student] talks about getting students to behave and answering their questions." (Observation 30)

"Two police people are appointed and given specific instructions about the role, such as to note down people behaving very well and / or very badly and note down what they're learning. They were told that they would need to be able to ask them questions at the end of the session." (Observation 6)

In practice, the students identified as the police typically lacked both the skills and the authority to carry this role out effectively and, in most observed sessions, they essentially became a proxy for the teacher whereby the teacher would use them to relay messages to the rest of the class,

"One group stumble across the Fibonacci sequence fairly quickly. The teacher sees the site they're on and sends the police person to tell them that they're onto something ... As different groups find pages about Fibonacci the police person moves around telling them that they're on the 'right' page, presumably having taken her cue from the early intervention requested by the teacher." (Observation 4)

"Police person moves around telling students to put their shoes on. (She is clearly endeavouring to control behaviour that the rest of her school experience tells her is inappropriate.)" (Observation 20)

"[Teacher] Mentions police person and asks what they do. Student, 'sends people out when they're naughty.' Teacher, 'Ok, and...?!' Student, 'and goes around seeing who is doing the best work.'" (Observation 24)

"Teacher [loudly to police person] 'Remember you're the police person so if you see anyone doing anything they shouldn't, do something about it!'" (Observation 27)

There were also numerous examples of students ignoring instructions given by the police who then appealed to the teacher to get involved, which they invariably did. The students simply lacked the skills required to develop the learning of their peers in a meaningful way. Even where students made basic mistakes, the police were rarely vigilant enough to notice,

“He [police person] doesn’t notice things like the group who are answering the wrong question, even after teacher asks him to check ‘what groups are doing, like is the question right?’ Teacher comments, ‘the police person sees the role as one of discipline, not helping with learning.’ Spends disproportionate amount of time with friends, doesn’t notice things like the question is wrong because he doesn’t engage with what each group is doing, just goes around checking they have something and they look focused.” (Observation 24)

This attempt to resolve the conflict between the shift in the division of labour and the object of the activity system was appealing to many teachers because it seemed to keep them within the rules of SOLE, in that they were redistributing power to another student, rather than back to themselves. In practice, this was not particularly effective and in the majority of sessions the teacher also intervened directly. While it did appear to resolve, to some extent, the tension that teachers experienced between the division of labour and achieving the wider object, only one of the teachers (Teacher H) who used a police person during SOLE was a regular SOLE user.

6.3.7 Longford School: Contradictions for Students

Just as students at Hillside School had experienced tension arising from the changed division of labour in SOLE, so too did students at Longford School, despite the fact that the shift in the balance of power was less extreme. They were similarly unsure about which division of labour took precedence and the extent to which they were truly empowered to organise their own learning and behaviour and this was exacerbated further by the fact that the teacher remained in the room, giving instructions which clearly contradicted the notion of self-organising.

- ***Division of Labour in SOLE and Division of Labour in Dominant Activity***

The conflicting divisions of labour between the dominant activity and SOLE were particularly difficult for students who genuinely wanted to do ‘well’ but were unsure of how to achieve this without the help of the teacher,

“Teacher explains that students can only talk to the police person. One student takes this literally and ask lots of questions, there’s clearly some concern, ‘But I need to ask questions, that’s how I learn!’” (Observation 20)

"[Teacher asks the class] 'did you enjoy the SOLE experience?' Teacher moves around listening and when class are back together says she heard an interesting point and asks a student to repeat it – they admit they found it difficult and stressful that they get no help," (Observation 27)

These examples suggest that, for some students, the changed division of labour created conflict because it was different to that which they were accustomed to in the dominant activity and they did not know how to navigate SOLE successfully. One interesting example of this tension arose during an observation with the highest attaining Maths class in Year 11. At the time of the observation, the students had already completed the content for their GCSE exam and the teacher explained the context of this SOLE during her interview,

"The class are doing Further Maths as well as GCSE Maths, so that's like a branch between GCSE and A Level, and there's topics on there that they've never seen before. So I thought that in order to cover a couple of topics quite quickly I could give two different types of questions ... so you had three groups working on one type of question, three on the other and then they'd be able to feedback their findings and we might, within two lessons, get a rough idea of how to answer two different, quite difficult topics." (Teacher J)

Thus, the question posed by the teacher was 'How would you answer this question and how would you teach it to the rest of the class?' Some students found this process extremely challenging,

"(The highest attaining [as identified by the teacher] student in the group ... got incredibly stressed out by the whole experience. He was frustrated that the teacher wouldn't give him help and wouldn't confirm whether he had the answer right when he found one. Once he'd decided that his answer was probably right, he calmed down enough to share his answer with the rest of his group, but it took most of the session for that to happen. Interestingly the other students in his group had been quick to say they couldn't do the task; there was a feeling that 'if he can't do it, we won't be able to!' The student later explained that he couldn't learn like that, he hated doing it [SOLE] and needed someone - 'Miss' - to just tell him what to do. He didn't disengage or lose interest, he just got very stressed and flustered.)" (Observation 2)

When the teacher reflected on this session during her interview, she noted that the students really struggled with the changed division of labour whereby they received no guidance on how to answer the questions or, perhaps more significantly, any reassurance about whether they were getting

the learning 'right'. They did not find this a positive or enjoyable learning experience, as she explained,

"when I said do you want me to take you back there? ... [they] said 'well we're not going back!'" (Teacher J)

It is clear that for these students the conflict between the division of labour in the dominant activity, where the teacher was an expert who guided them through their learning, and the division of labour in SOLE, where they received very little support and no confirmation that they were doing well, made the SOLE experience particularly uncomfortable, even unpleasant. The teacher suggested that this response was a characteristic of the particular students in this group, who did not tend to struggle with the subject and were used to getting answers correct with relatively minimal effort; it is perhaps unsurprising that they did not enjoy the uncertainty and loss of positive reinforcement that SOLE engendered. She observed in her interview that those students in the group who found Maths a bit more difficult were better equipped to deal with the experience. This SOLE was an interesting example of students struggling with the division of labour, but they were an anomaly amongst the data in that they were the only example of students, in either school, who were so motivated to participate and yet found the process overwhelmingly frustrating and difficult. This might partly be due to the fact that there were clear 'right' answers to the Maths questions they were answering, as opposed to the more open-ended questions that are common in SOLE, and that the content was so directly linked to the exams that students would take. Nevertheless, it was an interesting response from a group of students who were apparently so institutionalised by a form of schooling that had worked well for them.

Although the extreme reaction in the example above was an anomaly, it is nevertheless clear that the majority of students did feel some level of tension arising from the changed division of labour during SOLE and, in an effort to resolve this, they often acted to renegotiate that division of labour back in the teacher's favour. For example, they asked the teacher for permission to do things that were outside of the usual NDS,

"Student, 'Miss, are we allowed to write on the whiteboard?' Teacher agrees. Student, 'Miss, can we write on the windows?'" (Observation 19)

As well as basic requests for permission, students were often keen to involve the teacher in their learning, both by asking for help when they felt like they needed it and by sharing what they had found with the teacher without being asked to,

*“Student calls to teacher, ‘Miss how do you work out km/second?’
Teacher, ‘You might have to do some conversions.’”* (Observation 33)

“A student shows me her writing on the window and asks what I think. (She wants to share, this girl doesn’t know me but she wants some reassurance and approval.) I ask her what she means by what she’s written and she’s happy to explain further, she seems keen for this opportunity to show off her learning.” (Observation 22)

“Groups occasionally call on the teacher to ask for help, she answers their questions and is happy to make suggestions, but only when called on to do so.” (Observation 5)

Thus, students at Longford School were keen to renegotiate the division of labour so that it more closely reflected that which they were comfortable and familiar with from their usual classrooms. The fact that teachers were present during the session and mediated during every SOLE observed, either directly, via a police person, or both, meant that students experienced a less dramatic shift in framing than students at Hillside School. Therefore, although students did still appear to experience conflict arising from the changed division of labour in SOLE, they were nevertheless typically working within a stronger framing than students at Hillside School and it appeared that this tension was felt less acutely.

6.3.8 Comparative Summary of how the Division of Labour Impacted Upon Appropriation

At Hillside School, the appropriation of SOLE on a whole school level resulted in ownership being transferred to the neighbouring Arts Centre activity system, while in Longford School ownership of SOLE was shared across all teachers. At both schools, teachers were free to try SOLE, or not, as they chose. However, at Hillside School they were required to adhere to a particular ideal of SOLE which maintained the integrity of student self-organisation as far as was possible within such a structured context. This greatly constrained teachers but there was a network of support and teacher development in place to support with the difficult transition between classroom and SOLE Room. In contrast, teachers at Longford School were

encouraged to adapt SOLE in practice as they deemed appropriate. The headteacher valued teacher experimentation, even where that diluted the SOLE experience, whereas at Hillside School, Emily and the headteacher prioritised the integrity of SOLE because it fit into a wider goal of changing teacher practice.

The framing that students experienced during SOLE appeared to be weaker than that of their usual classroom experience in both schools. However, at Hillside School this weakening was extreme because students gained meaningful control over their learning and behaviour for the majority of a SOLE session, to the point where some students appeared to actively taunt their teacher, whereas at Longford School the extent to which the framing weakened varied depending on individual teachers. At its most extreme, students appeared to be expected to behave in the SOLE Room in much the same way as they might in their usual classroom, thus the opportunity for any meaningful self-organisation could be limited at Longford School.

In both schools, teachers experienced contradictions arising from tension between the changed division of labour in SOLE and the object of the school activity system. Teachers felt under pressure to ensure that students achieved in high stakes tests and found this difficult to reconcile with the reduced control over learning that they experienced during SOLE. In both schools, this limited SOLE use in a variety of ways, for example teachers avoided using it with certain year groups or with particular classes. The extent of this reduction was much more pronounced at Hillside School, where teachers had comparatively little capacity to adapt SOLE and where the changed division of labour was extreme enough to impact on teacher identity. At Longford School, while there were certainly groups of students who rarely got to use SOLE, there were also fairly high levels of engagement from some teachers. This was partly explained by the fact that teachers could mediate the learning because they were present in the room and thus, they could ensure that students engaged with appropriate content because the framing was not weakened so drastically. Some teachers were also able to resolve this conflict through the use of a student police person. This individual acted as a mediator between teacher and students yet teachers felt

reassured that they were acting within the parameters of Mitra's SOLE because this redistribution of power was, in theory at least, to another student instead of back to the teacher. In both schools, teachers also resolved this conflict by making SOLE into something of an enrichment activity, as opposed to a strategy for learning prescribed content; at Hillside School SOLE was most often used for Time for Success sessions and at Longford School, the heaviest usage of the room occurred in the final half term of the school year.

At both schools, students also experienced conflict between the differing divisions of labour that existed in SOLE compared to their usual classrooms. They were unsure which took precedence and struggled to understand how to be successful in SOLE without guidance or reassurance. Students tried to resolve this type of conflict by attempting to renegotiate the division of labour back into the teacher's favour. This tended to be far more successful at Longford School, where teachers were present throughout the SOLE and were themselves intervening in the sessions, thus they tended to default to answering student questions directly. Undoubtedly the shift in framing was more marked at Hillside School as a result of the way that SOLE was appropriated there.

6.3.9 Conclusion

In this section I have discussed my findings in relation to the division of labour that manifested in each school during SOLE. I have considered how the contrasting divisions of labour shaped appropriation in each context, from both teacher and student perspectives. I have also discussed the contradictions that arose at each school as a result of the differences between the division of labour in SOLE and that of the dominant or neighbouring activity, as well as those pertaining to the object of the education activity system.

6.4 Conclusion

In this chapter I have presented empirical data to address my remaining research questions. I considered the rules that were operant in each context, as well as the division of labour that manifested, and the extent to which these impacted upon appropriation. I described the contradictions that

teachers and students experienced due to the contrast between the rules of SOLE, with the concomitant shift in the division of labour, and those of the dominant activity. I have shown that the rule that created such an extreme redistribution of power at Hillside School was a result of the shared object of the neighbouring activity systems and that it was a significant reason why teachers found it so difficult to sustain SOLE use in that context. At Longford School the fact that teachers could adapt the rules to support them in working towards the object, in particular by retaining much of their control, resulted in a diluted version of SOLE when compared to Hillside School, but it did also appear to make it more sustainable. Having presented the empirical data relevant to my research questions, in the next chapter I will build upon these findings in more detail.

Chapter 7. Discussion

7.1 Introduction

This chapter aims to develop some of the main findings presented in the previous chapter. The overarching focus will be on the research question,

“How was SOLE appropriated in two English secondary school contexts and what factors impacted upon that appropriation?”

Within this chapter, there are three distinct sections. I will first consider the activity systems as they manifested during this research and suggest that the schools should be understood in each case as part of a series of nested activity systems. I will show that the power distribution within those systems was significant and greatly influenced SOLE appropriation at each school. I will then explore the extent to which SOLE use proved to be sustainable in this context, with particular reference to the concept of hybridisation. It was evident that the two schools had very different priorities when implementing SOLE and I argue that these significantly affected the types of sustainability that were possible. Finally, I will consider why so many teachers who were enthusiastic about SOLE struggled to make it work in a way that satisfied their dual motives simultaneously and I will characterise this as an ‘epistemological fog’. I aim to demonstrate that the two teachers who adapted SOLE effectively were able to do so because they recognised that the epistemological underpinnings of SOLE differed to those of the dominant activity.

7.2 The Significance of Power in a Nested Activity System

7.2.1 Introduction

One finding that arose from this research was confirmation of the extent to which the education activity system at a national level impacts on teaching in classrooms, and specifically on what happened during SOLEs. This led me to conceptualise the education activity system as a series of nested activities, where one activity existed across a range of levels. Significant within this was the impact of the distribution of power across those nested systems. In order to discuss these findings, in this section I will first justify the conceptualisation of the education activity system as a series of nested

activities, rather than interacting neighbouring systems, making links to some similar ideas in the existing literature. Then I will discuss the distribution of power observed across the education activity system in this research and how it impacted upon SOLE appropriation, before considering the implications of this for schools and teachers.

7.2.2 Justification of the Nested Nature of the Education Activity System

Clarifying the object was a vital stage of this research because once I understood 'educating students' to be the sense maker (Kaptelinin, 2005), it was clear that the context within which I was researching was one layer of a much bigger system. For while teachers and schools are working towards the object of educating students, so too is the education branch of national government. From an AT perspective, the activity system should comprise the "minimal meaningful context' for understanding human actions" (Barab, Evans and Baek, 2004 p.200) and as this research progressed it became clear that it was difficult to understand the activity system at a school level without reference to the wider national system. Although third generation AT has developed to accommodate analysis of more than one activity system, it focuses on interaction between neighbouring systems centred around a partially shared object (Engeström, 2001). As discussed in Chapter 3, this appears to oversimplify the concept of interacting systems because it understands them to be separate entities; there is little consideration of how the different nodes of nested activity systems might influence each other. Yet it seemed clear to me that, not only were the different layers of the education system fundamentally part of the same activity because they all had one object, albeit driven by different motives, each element of that system at the national level significantly impacted upon the education activity system at a local level. This went beyond a shared object; when teachers spoke about their decisions to use SOLE, or not, and how they acted within the SOLE Room they made direct reference to the rules and tools of the education system at a national level, particularly the system of accountability linked to high stakes test results,

"I probably would [use SOLE] if it wasn't for the content-driven schemes, and obviously assessment and all the kinds of things that go with

accountability within schools. There's so many things, for me, to put you off it!" (Teacher 8)

"But then again, when they get up to GCSE they don't do that anymore, it's exam questions, exam questions, exam questions!" (Teacher 7)

"I might not feel confident that Ofsted would deem SOLE to be a lesson that could achieve, ... I don't know enough about how Ofsted Inspectors would perceive a SOLE lesson ... in the preparation I would be nervous about if the Ofsted Inspector deemed it to be as useful as I believe it is, or the school believes it is." (Teacher B)

"because of all this pressure of exams and A Levels, I think there will be points in the year where I wouldn't go anywhere near it [SOLE] because I'd be that frightened that I'm missing a lesson." (Teacher C)

As is evident from the examples above, when teachers referenced the tools and rules of the national system, it was usually in terms of conflict and tension. It seems clear that these fundamental aspects of school life, though they are created at the national level, must be understood as being an intrinsic part of the school system, which is possible by conceiving of the education activity system as one system with nested levels of activity. It was not simply a case of some components of one system becoming the rules of another, as Barab *et al.* (2002) found, it was far more fundamental than that. For example, the pressure that schools are under has resulted in significant levels of self-policing, where in order to achieve normalisation of the practices that Ofsted require, those same rules are introduced to everyday school life, for example by using Ofsted language in school practices (Greany and Higham, 2018). Thus the tools used at national level are appropriated to become tools within the schools themselves and the distinction between different components of the system become blurred.

The notion of different layers within activity systems exists within AT literature, though it is little explored. Yamagata-Lynch (2010, p.25) uses Rogoff's (1995) three planes of sociocultural analysis, namely personal, interpersonal and institutional, to distinguish between what I have identified as the different layers of an activity system and she recognises that object-oriented activity can occur on each plane. However she suggests that they should be analysed separately by identifying the subject that is appropriate for the plane on which the research is focused. Thus the personal plane would focus on an individual, the interpersonal on a group and the

institutional on a whole organisation. While she cautions that no plane should be ignored and relevant features of those that are not prioritised in the analysis should still be taken into account, this does not seem to provide sufficient scope for analysis of the fundamental interaction between layers which impacted on the appropriation of SOLE in this study. Full consideration of the nodes of the activity system at each nested level was significant, whereas in Yamagata-Lynch's (2010) conceptualisation the activities seem not to be nested so much as parallel to each other. Similarly, Núñez (2009) identifies three levels of analysis: the micro, for example a classroom, institutional, such as a school and cultural-historical which encompasses the wider society. She describes these as nested activities, yet only considers the activity theory components at a micro level, the systems within which it is nested are simply reduced to 'schools' or 'society' with no analysis of the activity system at each (*ibid.*, p.10). A small number of researchers make reference to the macro context of activities and how this can influence at the micro level (Barab *et al.*, 2002; Jaworski and Potari, 2009; Barneveld and Ertmer, 2014; Benson, Lawler and Whitworth, 2008). But such research tends to focus on how the broader social context of a school impacts upon students, for example Jaworski and Potari (2009) explored how local community attitudes conflicted with teacher expectations and impacted upon student behaviour in school. While some researchers make reference to the significance of the macro level, for example in terms of impacting upon teacher agency (Hartley, 2009), the activities are still perceived to be fundamentally separate and there is little exploration of the implications of the distribution of power within that system.

My conceptualisation of the education activity system as 'nested' arose from Cole's (1996) 'culture-as-garden' metaphor. He used this to explain the significance of both the "'microworld' of the individual plant and the 'macroworld' of the external environment" (*ibid.*, p. 143) because, although the individual plant might be the focus, it is dependent on the wider ecological system and thus the 'gardener' must pay attention to both (Cole, 1995). Here, the 'garden' combines both culture and context. Thus, he conceives of an activity as being composed of embedded contexts which he argues both constitute and are constituted by the contexts on either side, see

figure 7.1. This is close to how I have come to understand the education activity system, however a key aspect of Cole's (1996) embedded contexts is that they are interdependent; nothing is unidirectional (Lim and Hang, 2003). This does not sufficiently account for contexts where there is an imbalance of power and I would argue that in the nested education activity system researched here, power was more usually directed from the national level into the activities nested within; little power was exerted in the opposite direction. Schools had some power at a local level, which often manifested as a form of resistance and SOLE use was an example of this, but the extent to which each layer of the system could

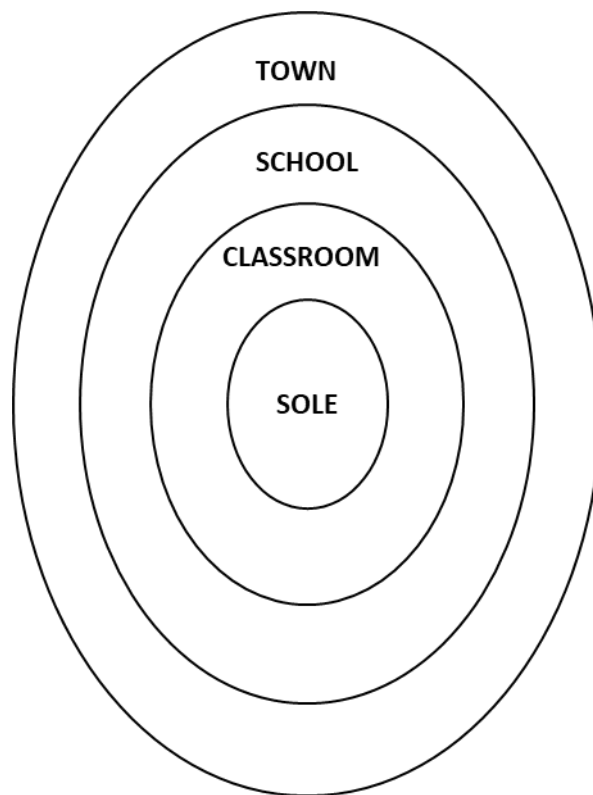


Figure 7.1 Adapted from Cole's (1996) 'culture-as-garden' model

impact upon the other was not mutually constitutive. In addition, the 'culture-as-garden' model does not make interaction between different nodes of the activity system explicit. Indeed, it does not develop the idea of wider levels of activity at all, assuming instead that identifying the layers of contexts is sufficient.

Lim and Hang (2003) attempted to incorporate this concept of embedded contexts into an activity system analysis where they defined the activity they

were researching as ICT-mediated classrooms, within a study about the integration of ICT in schools in Singapore. They identified the various elements of the activity, using the AT nodes, and then considered the broader socio-cultural contexts. However, this still did not allow for those contexts being a part of the same multi-layered, or nested, activity. There was little articulation of the nodes, such as rules and division of labour, within the wider socio-cultural contexts, or of how they might change or influence activity at a local level. The object of the teachers was noted as the development of higher order thinking, while the object of the school was identified as being improving exam results in order to place highly in the published league tables (*ibid.*, p.61). It was argued that the teachers' object changed to align with the school's object when pressure was put upon them to improve results. I would question the identification of the objects in this instance, as discussed in Chapter 3, because it seems clear that understanding each of these contexts as separate activity systems is problematic. If this was conceptualised instead as one nested activity system, it would be possible to better understand both the actions taken within that activity system as being influenced by the emergent object, and the impact of the power relations within that system, which would appear to be distributed in a similar way to that which I observed in the education system in England. Thus the concept of nested activity systems, as I have conceived of them, is not reflected elsewhere in the AT literature.

To summarise, the identification of the object is an important, yet difficult, stage of AT research. I understand an object to be collective, historical, durable and stable, and as such I would argue that AT has greatest explanatory value when an activity is understood to be something more than an 'activity' in the smallest sense. In this research it seemed clear that the how and why of SOLE appropriation could only really be understood if it was recognised as being one part of a much broader activity, one which worked towards educating students across a range of levels. This raised different questions, not least how that object emerged in practice, which will be explored in the following section. However, once the object had been identified, it was clear that the activity system was much broader than just one classroom or one activity or even one school, because that object was

created at a national level through the implementation of the government's education policy. These different layers within the education activity system were conceptualised as 'nested' because, while there are examples of activities which could be analysed separately within each level, it was the interaction between the various elements of those systems which really helped to explain SOLE appropriation in this context, see figure 7.2.

7.2.3 Distribution of Power Within the English Education Activity System

The findings from this research suggest that the distribution of power within a nested activity system can have a significant impact upon how that system responds to a new innovation, such as SOLE. Within the education activity system, increased centralisation of control since the 1980s has reduced the amount of power that headteachers, and consequently individual teachers, have, while simultaneously increasing their levels of accountability (Fullan, 2016; Lingard, Martino and Rezai-Rashti, 2013). As Solomon and Lewin (2016) observed, the performance measures that are now used to hold both schools and teachers to account can create an insurmountable contradiction with schools' attempts to achieve change; the government controls, directly or indirectly, what is deemed to be valid knowledge as well as valid transmission and realization of that knowledge (Bernstein, 1975).

The impact of the accountability and performativity framework on schools has already been established in the Literature Review in Chapter 2, however my findings suggest that this arises because of an 'unsuccessful' object (Kaptelinin, 2005) which is nevertheless maintained due to the uneven distribution of power within the education activity system.

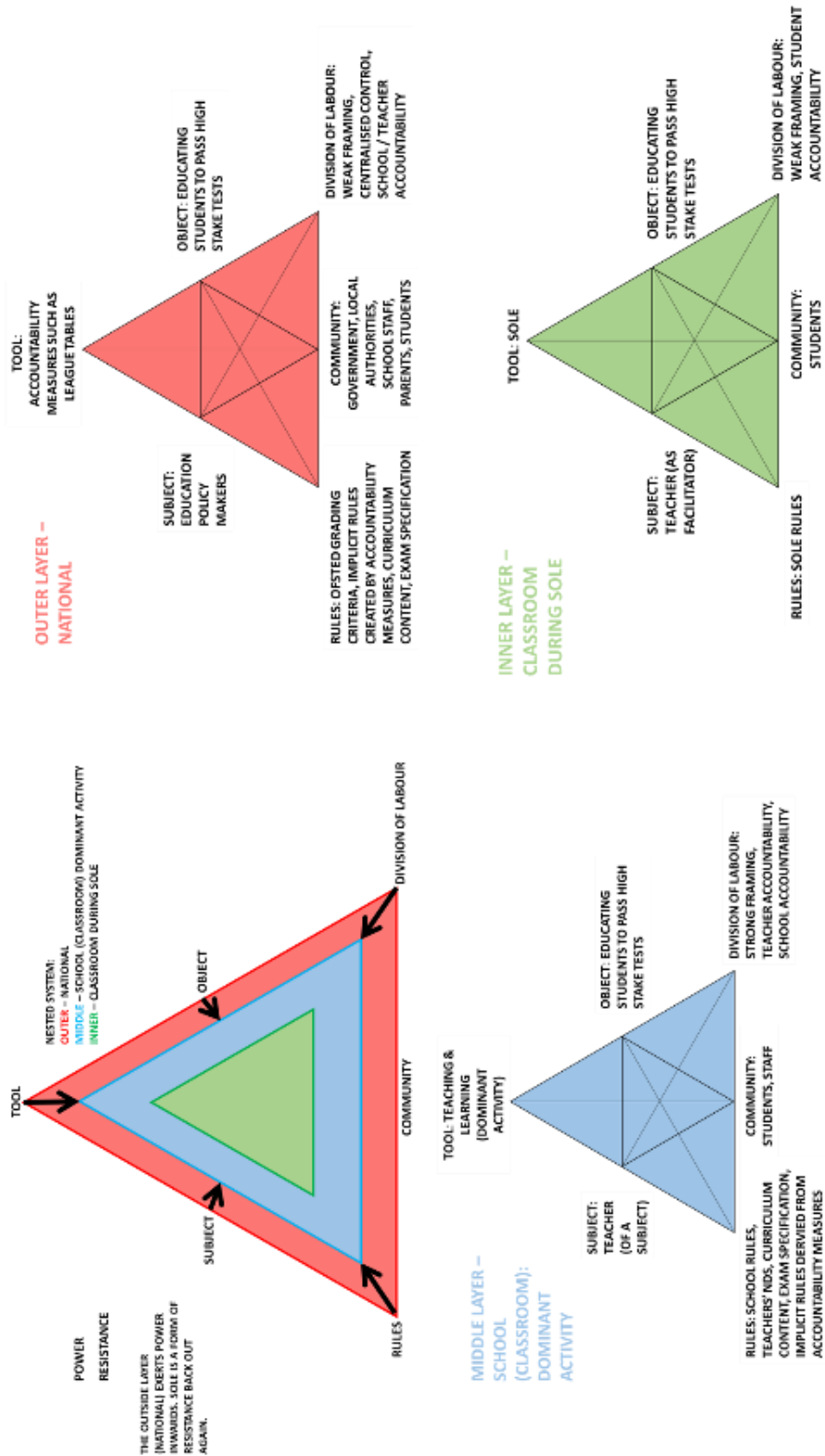


Figure 7.2 Nested Education Activity System

- ***An Unsuccessful Object***

The appropriation of SOLE in both school contexts was most commonly influenced by the object, resulting in what appeared to be an “object directed” system (Barab *et al.*, 2002, p.102), and so it is worth considering how that object was both constructed and instantiated. It is argued by some that objects emerge through “negotiation,” “discourse,” and “collective reflection” (Nardi, 2005), however my findings suggest that describing object formation using such collaborative language does not reflect what happens in a nested activity system where there are clear imbalances of power. Although there is some scope for schools to act to satisfy different motives at a local level, the object of the education activity system, as it applies within schools, is dictated by the government and enforced using the rules and tools of the national level of the activity system. This is not necessarily problematic where that object is deemed ‘successful’ (Kaptelinin, 2005), and the object of educating students is hardly a controversial one for an education activity system, however objects are emergent and the definition of educating students has recently been reinterpreted. In broad terms, the students can be understood as the ‘object’ and ‘preparing students to be economically and socially useful citizens’ may be the ‘gegenstand’ (Nardi, 2005). However, a discourse around what this actually means or how students might best be prepared for such a future is largely absent (Alexander, 2008), having been subsumed within an agenda to raise standards, as measured by high stakes testing and outperforming other countries on PISA tests (Lingard, Martino and Rezai-Rashti, 2013). There is now an assumed causal link between achieving on such tests and the production of economically and socially useful citizens (Alexander, 2008) and thus the scope of the emergent object ‘educating students’ has become so narrow that it means little more than preparing students to achieve in high stakes tests. The accompanying framework of accountability provides a means by which the national level of the activity system can ‘steer from a distance’ everything that happens in schools (Lingard, Martino and Rezai-Rashti, 2013; Greany and Higham, 2018).

This narrow object drives everything that happens within schools. However, it fails to meet Kaptelinin's (2005, p.17) criteria for a 'successful' object, which should achieve the following:

- balance: varying motives should be properly represented;
- inspiration: the object should not be just feasible but "attractive and energizing.";
- stability: the object should not change too often;
- flexibility: the object must change when needed to avoid obsolescence.

Using this criteria, the object of the education system, as instantiated in the two schools that participated in this research, would appear to be 'unsuccessful' for a number of reasons. There is a clear imbalance of motives represented within the object because it is not constructed in collaboration with teachers, many of whom appeared to feel that the balance between preparing students for tests and developing them in other ways was wrong. Teacher motivations for using SOLE were twofold, both to support students to achieve in high stakes tests, which helped work towards the object, and to develop students as independent learners, a motive which was absent from the object. As this was arguably the main motive for teachers choosing to use SOLE, it is reasonable to assume that it was part of their wider motive when engaging in the education of students. The imbalance in the object was further distorted for some who felt that they were no longer actually teaching students their subject, rather they were teaching them the information needed to pass tests,

*"because of how heavy curriculum is, you're not actually teaching Science any more, you're teaching 'the Science Curriculum'."
(Teacher 8)*

In addition, teachers did not typically seem inspired by the narrow instantiation of the object that they understood to be dominant,

"I'm pretty limited in terms of the end product that I've got to get them to, not that I necessarily want to get them to, but that I have to. I mean all the groups [during Observation 1] came up with radically different kind of end points which were all interesting in and of themselves, but if you're teaching with an end point in sight and you design an activity that lets them all go off independently then you run a risk that a lot of

people are going to end up at a point that you don't need them at. Which is depressing but it's possibly the truth." (Teacher I)

The emotive language used at the end of this extract implies that the teacher felt resigned to the object of the system and certainly it is difficult to interpret his comments in a way that might suggest a feeling of inspiration. This sentiment, particularly the lack of control, was echoed by most teachers during their interviews. In terms of stability, some teachers felt as though the object was changing by narrowing even further, but they did not appear to feel as though they could impact upon that in any meaningful way. Any flexibility that existed was not available beyond the national level of the activity system,

"I think I'm even further away from [using SOLE] than I've ever been in my teaching, and I've only been teaching 4 years. I just feel like there's been a massive jump and I think exams and just testing in class and saying like you have to do things in this amount of time, that's so structured ... I don't know if government's going to change, and it comes from top-down. I think it's only going to get worse. I think students are going to have to learn so much and retain so much for their exams. It's all exams," (Teacher V)

When measured against Kaptelinin's (2005) criteria, it seems clear that the object that exists, particularly as it emerges at school level, is unsuccessful. Engeström (2009) recognises that objects can be contested and that where this is the case they tend to generate opposition and controversy. He argues that this can be the first step towards transformative learning. However, this does not seem to have happened in the two cases researched here, despite the clear dissatisfaction that exists with the object, and this can be explained with reference to the distribution of power within the nested education system.

- ***Power Imbalance***

The findings of this research have therefore shown that many teachers perceived the object to be unsuccessful, yet it persisted. This can be understood as a consequence of the power distribution within the nested activity system. While the impact of the accountability and performativity framework is widely recognised within educational research, there is little consideration given in the AT literature to the distribution, or impact, of

power within activity systems (Daniels, 2004; Popova and Daniels, 2004; Davis, 2012). In a discussion regarding the future of AT, Engeström (2009) does begin to address how the distribution of power between neighbouring activities might impact upon each other. In particular he suggests that tools used in one activity system could become the rules of another system. However, this maintains that the power imbalance arises between activity systems, rather than within them, and even so, there is little evidence of this having impacted upon subsequent AT research. Indeed, even when AT researchers concluded that an innovative approach had ended due to its failure to deliver results in the accountability culture, a discussion of power within the system was absent (Solomon and Lewin, 2016). My findings would seem to suggest that an imbalance of power enables the national level of the education activity system to dictate many aspects of the school system and that this is fundamental to any explanation of why it is so difficult to successfully implement innovation in secondary schools.

The imbalance of power has evolved through a process of centralisation of education, where schools and teachers are monitored through a process of accountability linked to the object, as measured by high stakes testing. AT can contribute to understanding the impact of this through its conceptualisation of the nodes of activity; it is not that the object is dominant in and of itself, it becomes so through interaction with the other elements of the system, particularly the rules, tools and division of labour. The concept of nested activity systems is significant here because the nodes of the system at the national level infiltrate to the school and classroom level and directly impact on the actions that are taken there. For example, league tables are a tool used at the national level to evaluate how successful schools are. These league tables publish a range of high stakes test data but there tend to be one or two headline measures, for example a school's 'Progress 8' score. The subjects that count towards a Progress 8 score are determined by the government, who can choose to include or disregard particular qualifications. It was well documented that high numbers of students were entered into the 'European Computer Driving Licence' (ECDL) qualification because it was perceived to be easier to achieve than equivalent GCSE subjects, indeed the number of students achieving an ECDL qualification increased by 350% between 2014

and 2016 (Staufenberg, 2017). The government subsequently removed ECDL from accountability measures with effect from 2018, at which point the number of schools registered to offer an alternative IT qualification, also perceived to be easier than equivalent GCSEs, more than doubled (*ibid.*) Alternatively, the English Baccalaureate (EBACC) measure tracks the number of students achieving passes in Maths, English, History or Geography, two Science subjects and a Modern Foreign Language, and this has come to influence the curriculum on offer at many schools (Abrams, 2017). This one tool, league tables, can therefore be used to explain patterns of exam entry year on year, as well as continued curriculum narrowing (Berliner, 2011). Thus it is not merely a tool used at the national level, it also becomes a tool to evaluate success used within schools and school leaders make judgements about educational provision accordingly. Similarly, the rules that are imposed on schools by the inspection body, Ofsted, have a real impact on the day to day practices of teachers in their classrooms. As already noted, school leaders attempt to normalise the practices that they believe Ofsted want to see by incorporating them into daily expectations and it is also common for mock Ofsted inspections to be requested by headteachers who are keen to gauge how prepared their teachers are (Greany and Higham, 2018). Perhaps unsurprisingly, then, some teachers who participated in this research stated that they would not feel confident about doing a SOLE during an Ofsted inspection and a number of others were explicit about the fact that they did not use SOLE because they did not find it to be the most efficient way to teach students the knowledge they needed for high stakes tests. Thus it becomes clear that the rules and tools of the education system at a national level enforce the object throughout the nested activities and ultimately shape the rules and tools of schools themselves.

This imbalance of power within the nested activity system manifests through the consequences for schools who fail to take sufficient account of the rules and tools at national level. Marketisation of schooling (Solomon and Lewin, 2016) has created local hierarchies in which schools are vulnerable to community perceptions, particularly around performance measures and Ofsted gradings (Greany, 2015); as school funding is linked to the number of students on roll, failure to disregard those performance measures can be

disastrous. Greany and Higham (2018, p.32) found that “external accountability can exert pressure on schools to narrow their focus onto student attainment and progress in external tests” and 83% of secondary school headteachers agreed that making sure their school did well in Ofsted inspections was one of their top priorities (*ibid.*, p.30). Given that a poor Ofsted grading can be used to justify forced academisation of schools, it is unsurprising that headteachers feel they have little option but to comply with the rules enforced upon them by normalising the behaviours that will be judged to be effective by external organisations (*ibid.*); thus Ball’s (2003) suggestion that performativity has come to define what work and learning actually are, is made possible through the education system at a national level. The national education activity system thus serves to ensure that schools are object-driven places, where that object is defined at the national level and is deemed unsuccessful by many of those within the nested levels of the activity system. This all helps to explain why it is so difficult for innovative practices, such as SOLE, to flourish.

- ***Implications for Innovation in Schools***

Having established that the distribution of power within an activity system can directly impact upon the emergence of the object of that system, as well as all the actions taken to work towards the object, it seems puzzling that SOLE was used at all in such a context. If the object has been identified as dominating almost every aspect of the activity, SOLE use appears as an anomaly. Arguably, the headteachers were not prioritising the object of the system when they agreed to have SOLE Rooms in their schools because it is not obvious that SOLE use would contribute to educating students in a way that was acceptable within the rules at a national level. Indeed, the headteacher of Longford School was explicit about welcoming the opportunity to focus on developing students’ ability to work independently and their resilience,

“I suppose we were encouraging our children here to be really powerful, resourceful, independent learners and SOLE is a bit of it ... having a lesson or a technique or whatever that can encourage children just to really become much more independent is great isn’t it? ... the whole concept of it is there to actively encourage children to become more independent and resourceful and so on” (Longford Headteacher)

However, while clearly being motivated to work towards an aspect of student education that did not form part of the object, neither headteacher was actually disregarding it either. Their representations of the object were that it could be achieved at the same time as students were developing skills such as independence, therefore they had found a way to make the object more locally meaningful, without changing the essence of what it was. The headteacher of Hillside School actually stated that effective use of SOLE would improve student achievement in high stakes tests,

“It’s that balance isn’t it, between developing the young people as learners and passing exams, and I think there is an increasing problem that there’s a hell of a lot of content needed to pass an exam. But in the whole move to a more mastery style, I think that’s quite compatible with SOLE which is about getting the kids to explore things in a way where it’s much more solidly there in terms of their understanding so then other things can be built upon ... and so I don’t think it’s incompatible with the exam system, any more than education generally is ... In a sense SOLE is about recognising that you’ve got access to the facts and the information and the exam system is about making sure that you can recall the facts and the information, and less about your understanding and application of it. Which is sad really.” (Hillside Headteacher)

Aware as he was of flaws in the object and the impact they had on the wider activity system, he nevertheless considered SOLE to be a way of working towards that object more effectively, explicitly stating that it could be used to improve high stakes test results. The headteacher of Longford School took a somewhat different approach, explaining that adaptation of new teaching strategies was important,

“I like that we’re a school where people feel comfortable to try things out, to try different things, to try different strategies and I always say to people that staff do that and they’re encouraged to do that and if they find that it works they’ll tell somebody and if it doesn’t work they’ll try something else instead.” (Longford Headteacher)

The question of what ‘works’, as defined by the current education activity system, is measured by high stakes test results. Thus having initially questioned the way that SOLE, as described by Mitra, would work in practice in a secondary school, he encouraged teachers to adapt it to ensure that SOLE was working to support the wider object.

For the teachers themselves, SOLE use can be understood as resistance against an object which failed to resonate with their motives, essentially an

attempt to exert some power from below. As discussed in the findings, teachers used SOLE as a form of conflict-resolution between multiple motives, a tool that they appropriated in an effort to transform the imbalanced object, as they perceived it (DeVane and Squire, 2012). SOLE use represented as an attempt to make that object more meaningful by providing students with an opportunity to work more independently,

"I think the learning's about the discipline of working unsupervised and working as a team unsupervised and having a resource, you know the Internet ... it's how they work together, what they produce and the skills, they get a lot of skills through that," (Teacher 7)

"They are more in charge of themselves and their own learning and they can go in a different direction and they have more freedom." (Teacher G)

"it is really good when you go in there and they enjoy it and they can do it for themselves and it does take the ownership off the teacher more and puts it on them, I like that part of it." (Teacher V)

However, SOLE use actually created new tensions for many teachers because they could not find a way to satisfy both motives simultaneously. Where teachers were successful in doing so, it appeared to be because they had an understanding of the epistemology of SOLE which will be discussed later in this chapter, but there were only two examples of such teachers in this research. At Longford School, the conflict arising from SOLE use was resolved by adapting SOLE through transitional actions (Sannino, 2008) which clearly prioritised the motive linked to preparing students for high stakes tests,

"initially, some of the boys who don't work in the lesson didn't really pay attention there so I had to put more management into it than I actually thought I did [so] if they weren't on task I just said 'look, you should be on task' and so that was the first lesson and they got quite a bit out of it. And then the second lesson I made a bit more directed, you know, 'can you come up with some strategies?'" (Teacher E)

It is clear here that the teacher's initial expectations that students could work independently were not borne out quite as she had hoped, so she acted to address that. Firstly, she felt it was important to ensure that all students were engaging in the task, conforming to the usual school rules of acceptable behaviour, and secondly she directed students towards particular examples of learning, as prescribed by the GCSE specification. Her motive regarding letting students work independently thus conflicted with her motive

regarding preparing students for high stakes tests and the latter took precedence because it more closely aligned with the object. Such changes in approach during a SOLE session were common at Longford School where hybridised versions of SOLE were common as teachers tried to satisfy the motive of developing student independence, without disregarding the object of the system. This provides evidence of the dominance of the object, as facilitated through an uneven distribution of power within the nested activity system.

- ***Hillside School***

SOLE use manifested slightly differently at Hillside School and it is important to briefly explain how the distribution of power impacted here. Neighbouring systems, as found in third generation AT, tend to interact around a shared object. The object of SOLE use within the Arts Centre system was concerned with encouraging creativity, while the school activity system retained the object of educating students, as measured by high stakes test results. The shared object of the two systems, where they intersected, was concerned with changing teacher behaviour on a broader scale; please refer back to figure 5.5 (p96) for a graphical representation of this. Conflict was deliberately planned by the headteacher and Emily, in an effort to achieve the shared object through the type of transformative learning that Engeström (2009) has suggested can arise from attempts to resolve fundamental contradictions. Thus it was hoped that experiencing the type of 'authentic' SOLE that Emily insisted upon in the Community Arts Centre would inspire teachers to change their wider teaching behaviours. However, in creating such a conflict they had underestimated the extent to which teachers would perceive SOLE to work towards the object, which perhaps resulted from a lack of an epistemological understanding of SOLE itself. In this context, there were two intersecting sources of power which sought to impact upon teacher behaviour, one within the education activity system and the second within the Arts Centre activity system. The latter dictated how SOLE must be done through the rules and division of labour and teachers were relatively powerless to defy those rules and do SOLE differently. At the same time, the education system required teachers to be working towards a particular

object and they appeared to feel that it was impossible for them to do that while complying with the demands of the Arts Centre system. Ultimately, the power exerted by the education activity system dominated because the teachers were not obliged to participate in the Arts Centre activity system, whereas they were fundamentally a part of the education one. It is worth reiterating that all teachers at Hillside School, with the exception of two, spoke wholly positively about SOLE, yet the room booking data shared in Chapter 5 showed that it was rarely used for subject teaching; this provides evidence of the distribution of power within that activity system.

7.2.4 Conclusion

Therefore, while SOLE use can be understood as a form of resistance to the contested object imposed upon schools, in reality it could not combat the pervasiveness of that object because a significant concentration of power within the education system was located at national level. This power could be used to impact upon both school and teacher actions because they were part of a nested activity system in which similar tools and rules could be found at each level of activity and were used to enforce the object. Failure to work towards the object in a way that was deemed satisfactory at national level could result in significant changes being imposed upon schools and thus it is vital to take such power dynamics into account. As demonstrated by the findings of this research, the imbalance of power within the education system can explain why innovation in schools can be so difficult to achieve; in the cases here, SOLE use was rare at Hillside School and only hybridised versions of SOLE were found at Longford School. The implications of hybridisation will be explored in the next section.

7.3 Can Innovation be Sustainable in an English Secondary School Context?

7.3.1 Introduction

It is clear from my findings that SOLE use manifested completely differently in the two schools, despite some similarities in context and the support that was available from Mitra. In this section I will consider the differing priorities that resulted in such contrasting approaches to SOLE appropriation and discuss the implications of those priorities when aiming to introduce sustainable innovations in education. I will then reflect upon what this research can add to a discussion about the value of hybridised innovations in schools before finishing with some suggestions about which elements of SOLE should always be retained in hybridised versions.

7.3.2 Contrasting Priorities for SOLE: how can Innovations be Sustained?

SOLE was appropriated very differently in the two schools that participated in this research which was partly because they were concerned with different objects, which meant that they had contrasting priorities for appropriation.

- **Hillside School: Fidelity**

It was clear at Hillside School that the headteacher's main motivation for encouraging SOLE use was the 'invisible' goal of changing teacher behaviour,

"we wanted to challenge maybe some of that more didactic, traditional teaching. We were taking the school on a school improvement journey and people felt that playing safe would get the results and actually we were saying not." (Headteacher)

This motivation was significant because it meant that how SOLE was appropriated was important; teachers needed to experience SOLE in a particular way so that they could see how different it was to their usual practice, leading to reflection upon whether there were things they could change in their daily teaching. Interestingly, it is possible that the decision to locate the SOLE Room in the Arts Centre, rather than in the main school building, made it less likely that such a fundamental change in practice would occur. Cuban (1993, p.5) has suggested that one way to transform a "fundamental" reform into an "incremental" change is to start with experiments in the classroom and then "migrate" them to "out-of-the-way

programs in the main building or faraway sites.” This exactly mirrors the trajectory of SOLE implementation that occurred at Hillside School. Nevertheless, due to the prioritisation of the shared object of the education and Arts Centre activity systems, the only form of SOLE that was acceptable was Emily’s interpretation of Mitra’s guidance. Fullan (2007, p.31) terms this the ‘fidelity approach’ whereby, “an already-developed innovation exists and the task is to get individuals and groups of individuals to implement it faithfully in practice—that is, to use it as it is “supposed to be used,” as intended by the developer.” This was partly informed by the headteacher’s belief that SOLE use was compatible with working towards the object and partly a deliberate attempt to create conflict for teachers based on an assumption that resolution of that conflict would lead to the kinds of changes in teachers’ own classrooms that the headteacher deemed desirable. It was beyond the scope of this research to investigate the extent to which such change happened, but it is worth noting that the headteacher himself believed that this strategy had been effective,

“[teachers] have much more confidence in terms of questioning, much more looking at things from an enquiry point of view and much more ability for the young people to make a major contribution to the learning and to be more self-organised and less directed.”
(Headteacher)

It is clearly difficult to isolate the extent to which SOLE alone might be responsible for such changes, however the SOLE Room booking data detailed in Chapter 5 shows only a very small number of teachers using SOLE, and infrequently, which leads to questions regarding the probability of such an impact. Nevertheless it is certainly possible that SOLE was an important part of a more comprehensive strategy to change teacher behaviour in their classrooms, indeed the headteacher referred to SOLE as “*another tool in the toolbox.*” (Headteacher).

Regardless of the wider impact of SOLE, the division of labour in the two activity systems at Hillside School resulted in teachers having no capacity to impact upon SOLE appropriation; if they chose to use it, they were expected to comply with Emily’s rules. This made innovative practice difficult to embed because such change tends to “depend on the commitment or involvement of local teachers” (Sannino and Nocon, 2008, p.325) but SOLE

had been deliberately designed to ensure there was little capacity for teacher involvement. There were two examples of teachers breaking the SOLE rules, as discussed in Chapter 6, and both occurred when Emily was not present in the Arts Centre. It is therefore conceivable that, had there been some flexibility in how SOLE was conducted, hybrids would have emerged at Hillside School. However, in reality it was not possible for hybridised versions to be created, unless they were being attempted in teacher's own classrooms. As discussed in Chapter 5, only one of the research participants, Teacher 7, suggested that he might attempt this, but described it as a variation on a research task which would not meet the minimum requirements for a SOLE, as outlined later in this section. Thus, due to a perceived incompatibility with the stifling nature of the object imposed on the education system, SOLE use faltered. On this basis, using SOLE to educate students at Hillside School proved to be unsustainable as an innovation.

- ***Longford School: Hybridisation***

At Longford School it was apparent before Mitra's SOLE Room had even opened that experimentation and adaptation of SOLE was acceptable because the headteacher welcomed the multi-purpose room designed by an early adopter of SOLE in the school. The headteacher's own scepticism regarding a lack of teacher intervention resulted in an expectation that teachers would mediate learning where they considered it appropriate. Teachers' pedagogical understanding of what worked, in terms of making progress towards the object, thus took precedence over adherence to Mitra's guidance on how to facilitate SOLE. As was explored in Chapter 6, this led to myriad adaptations of SOLE itself, some of which were in line with the principle of self-organised learning and some which detracted from it. These actions are conceptualised by Sannino (2008, p.335) as "transitional", referring to an action which is "not a straightforward step to continue [the innovation], but it was also not simply a return to the normal teaching—it was something in between." As they manifested at Longford School, such transitional actions aimed to ensure that outcomes from SOLE sessions supported teachers in working towards the object, as measured by student performance in high stakes tests, usually by directing student learning or managing behaviour

that was perceived to be off task. These actions resulted in the evolution of hybridised forms of SOLE which Cohen and Mehta (2017, p.649) might characterise as “weak implementation” of an innovation. Undoubtedly, each of these transitional actions had the effect of diluting the SOLE process by realigning the balance of power to more closely reflect that of a teacher’s usual classroom. Yet, my research findings also suggest that during SOLE framing was weaker than it tended to be in the rest of the activity system, however marginally and temporarily; certainly teacher perceptions were that they were intervening in both learning and behaviour less than normal and some students confirmed that. In addition, without such transitional actions it seems fair to assume that SOLE use would have faltered, just as it did at Hillside School, because it was those actions which enabled teachers to resolve the conflict between the rules and division of labour of SOLE and the object of the education system. Hybrids result from wider systemic problems (Karasavvidis and Kollias, 2017) and, as has been previously demonstrated, the object in this activity system was too narrow and too dominant for a strict implementation of Mitra’s SOLE to be viable. It seems fair to suggest, as others have (Leat, Thomas and Reid, 2014), that hybrids were the only form of SOLE that could be sustained in this educational activity system, where the consequences for failing to adequately work towards the object could be punitive. This has some important implications for those seeking to introduce innovations in similar educational contexts, as will be discussed later in this section.

- ***Was SOLE Use Sustainable in Either Context?***

Any attempt to evaluate the extent to which SOLE use was sustainable in either school depends on the definition of sustainability that is applied, which in turn determines the criteria for measuring success. It is worth reiterating that the two schools had very different goals when they introduced SOLE and thus what was understood to be effective practice in one school was actively discouraged in the other. Therefore, it seems appropriate to judge them according to different definitions of sustainability. It is evident that neither school achieved sustainability in terms of regular SOLE use where SOLE adhered faithfully to Mitra’s guidance, which had been part of the aim at

Hillside School, but as has already been concluded this was not really feasible within the education activity system. However at Longford School, where individual teachers enacted hybridised versions of SOLE, it did become sustainable in that it continued to be used by a number of teachers as part of their wider teaching practice. For example, some departments such as Geography, Sociology and Health and Social Care, embedded SOLE into their schemes of work so that they were used with all students in a year group for learning about particular topics. Other teachers and departments had a less formalised approach to SOLE but they used it on an ad hoc basis when they felt that there was an appropriate opportunity to do so, as guided by the subject content, for example Teachers B, C and S. For the majority of students, opportunities to use SOLE would have been infrequent, yet it did form a small part of their teaching and learning experience. Although the extent to which SOLE reflected the independent, open approach to learning that Mitra advocated differed greatly between teachers, who essentially created their own bespoke versions best described as “teacher-invented mixtures” (Cuban, 1993, p.277) of SOLE and more traditional strategies, there was nevertheless a shift in framing during SOLE sessions. There is evidence to suggest that hybrids, however diluted, can result in some “fundamental changes, or reframing, to relationships between teachers, students and the curriculum.” (Leat, Thomas and Reid, 2014, p.103). Therefore any change in teacher behaviour during SOLE may also have impacted upon their usual teaching practice. Although it was beyond the scope of this research to evaluate the extent to which that might have happened, there was some evidence that SOLE use resulted in wider changes. This potential was exemplified by Teacher I who had been interested in SOLE but, after trying it, felt that it was not appropriate for his subject given the object he was continually working towards,

“my job is to teach them to read and write ultimately, to improve the basics, to improve their reading skills and you don’t tend to improve students’ reading skills, especially reading in depth, when you put them on the Internet because they don’t stay on web pages for a long time.”
(Teacher I)

“I could use the Internet to analyse the techniques in a poem but I could tell them myself in 15 minutes and it would be probably more effective”
(Teacher I)

Clearly there was no real value, as Teacher I saw it, to using the Internet to teach his subject, yet there were elements of the SOLE process that he believed worked well and he explained how he had taken those and adapted them for use in his own classroom,

“I got a lot out of it [SOLE] in terms of how much kids enjoy writing on the wall! Which has made me transform my classroom because that was interesting: the students who won’t write on a piece of paper, when you give them a pen and tell them to write on the wall suddenly can’t do enough of it. Or the windows. So I redesigned my whole room on the basis of that, so that’s worked a treat. And the grouping strategy is interesting. I’ve done SOLE without the computer if you like, today with my Year 8, as a way of preparing for an essay. I said ‘right, group yourselves into groups of four and go and borrow each other’s ideas and wander between groups, (but rather than computers I used some pens, and Chapter 16), off you go.’ But I tell you what they all engaged with that, more so than they did when they got on computers.” (Teacher I)

This teacher was not interested in continuing to use SOLE itself, instead he took the elements of the process that he considered effective and incorporated them into his classroom practice. He later shared this new strategy with other teachers in his department (Teacher V). This is a different kind of transitional action, one through which “dominant and non-dominant activities begin to merge and hybridize.” (Sannino, 2008). Thus this action was not an attempt to persevere with SOLE, although it can be argued that elements of self-organisation were retained, rather this teacher’s thoughtful reflection on his SOLE experience resulted in the adaptation of an existing strategy. Karasavvidis and Kollias (2017, p.105) articulate this as “assimilating reforms into current practices rather than changing current practices to actualize reform.” While the extent to which SOLE implementation may have impacted upon the wider ‘ecology’ of the school during the process of implementation is beyond the scope of this research, this does offer some evidence of that happening. Thus an analysis of the ecology of a school during implementation is important in order to identify the ways in which the innovation itself might influence the surrounding environment; this might be as significant as the way in which the context shapes the innovation, but is likely to be less obvious. It is clear, therefore, that SOLE impacted upon Teacher I’s wider practice, however incrementally, and shifted the division of labour of collaborative work that happened

regularly in his classroom slightly more in the students' favour.

Dissemination of the strategy within his department meant that it also had the potential to change the practice of other teachers.

At Hillside School it was clear that SOLE use was not incorporated into teachers' regular practice and many students may not have experienced it at all. It was not possible for hybridised versions to evolve here and, had they done so, they would have been considered failed attempts at SOLE. However if we consider an alternative definition of sustainability to refer not only to "local continuity, but also to diffusion and adaptations in other settings." (Sannino and Nocon, 2008, p.326), there was scope for success at Hillside School. One of the most prolific users of SOLE was Emily, the non-teaching Arts Centre Manager who had responsibility for SOLE use. During the data collection period she facilitated one fifth of all the SOLE sessions that occurred, despite having no classes of her own and no teaching responsibility. Emily's SOLEs were predominantly undertaken with visiting primary school groups which could be understood as evidence of sustainability through diffusion,

"we have been a bit of a beacon in the area which I think again has enthused a lot of people to go away and do their own thing, even do their own room in some instances. [I: Oh really?] Yeah, one of the primary schools." (Headteacher)

In addition to inspiring the creation of a SOLE Room in another local school, Emily hosted conferences based around SOLE use (Emily) and visits to observe SOLE at Hillside School were often included in a programme of activities for educators and academics visiting Mitra at Newcastle University. It seems fair to assume that it was the strict adherence to Mitra's SOLE guidance which made this location a more popular choice for visitors than Longford School, because it demonstrated an undiluted version. Therefore, although it can clearly be argued that the fidelity approach (Fullan, 2007) to SOLE use was a key reason why it was not adopted in a sustainable way by the teachers at Hillside School, it arguably resulted in wider diffusion of the innovation and thus can be deemed sustainable according to an alternative definition (Sannino and Nocon, 2008). The extent of subsequent adoption is

well beyond the scope of this research but it is clear that, using this criteria, the potential for sustainability existed.

Therefore the two schools can both be said to have achieved some sustainability, albeit in different ways. Longford School was able to sustain SOLE use across a range of subjects and teachers and, by the end of my data collection period, it was clear that SOLE use had been embedded in some departments. However all versions of SOLE at Longford School had been adapted into diluted forms of Mitra's innovation, to greater or lesser extents. There was also some evidence that SOLE impacted on wider teaching practices within the school because one teacher took elements of the process back to his own classroom and incorporated them into his usual strategies. This appeared to be shared with other colleagues, who took Teacher I's adapted strategies and presumably modified them further for their own classrooms. Any diffusion of SOLE in this sense was localised to the school itself. Although there was no comparative sustainable use of SOLE at Hillside School in terms of teacher use, there was nevertheless significant scope for the wider diffusion of SOLE because the SOLE Room in the Arts Centre became something of a showpiece. There is evidence that local teachers who engaged with SOLE at Hillside School returned to their own schools and introduced the concept there, even to the extent that they created their own SOLE Room (Headteacher). In addition, many national and international educators and academics visited Hillside School's SOLE and thus the scope for spreading the innovation further was significant. Whether either school provides an example of successfully sustaining an innovation depends on the definitions of sustainability that are deemed valid; I would argue that both schools were successful, though from the perspective of this research it was the hybrids at Longford School that were most interesting.

- ***Do Hybridised Versions of SOLE Have Value?***

While encouraging hybridised versions of innovation might be preferable when addressing teachers, there is some debate in the academic literature surrounding whether they are a desirable alternative to no change in practice at all. As noted, Cohen and Mehta (2017, p.649) described them as a form of "weak implementation" and, inevitably, adaptation of an innovation results in

some elements being “diluted or missing” (Leat, Thomas and Reid, 2014). Cuban (1993) argues that the value of hybrids depends upon what we define as effective teaching, yet even this is problematic in an education system in which so many teachers believe the object of the system to be unsuccessful (Kaptelinin, 2005). If we accept that the current consensus around what it means for a student to be successfully educated centres around the grades that they achieve in high stakes tests, then the hybrids of SOLE that existed at Longford School must be considered to be more successful than the faithful adherence to SOLE that occurred at Hillside School. However, some teachers who participated in this research argued that they were still less effective than their usual teaching strategies and thus no innovation at all was preferable (for example Teachers 4, J and W).

The majority of teachers who created hybrid versions of SOLE at Longford School could be said to have weakly implemented (Cohen and Mehta, 2017) Mitra’s guidance. They often, though not always, either asked questions that were open but lacked real purpose, such as ‘What was here that isn’t now?’ (Observation 27) or questions to which there was ostensibly an answer, where it was hoped that students would follow a trail from the question to the information in the teacher’s head, for example a question asking what linked together snail shells and sunflowers, to which the answer was the Fibonacci Sequence (Observations 4 and 35). In addition, many teachers directed students to work in particular groups (for example Observations 6 and 20) and they retained control of small and irrelevant (to learning) details, such as whether students could wear their coats, write on the walls or open the windows (for example Observations 1 and 19). They also, as explored in some detail in Chapter 6, vacillated along a spectrum that included encouraging, directing, challenging and even dictating learning, often with little reference to the SOLE ‘rules’. It is beyond the scope of this research to evaluate the effectiveness of the learning that occurred during these SOLEs in terms of measurable outcomes, however as an experienced teacher I was at times underwhelmed by the information shared by students in the debrief and unconvinced by the extent to which they either understood or would retain what they had found. Nevertheless, there is a case for arguing that these SOLE hybrids were useful tools for teachers. Firstly, as previously

discussed, they enabled teachers to resolve the conflict that they experienced between the narrow object they were obligated to work towards and the wider motives they had for engaging in the activity system. A significant majority of teachers at both schools spoke positively about SOLE and about the opportunities it provided for students to experience a different way of working and to develop wider skills. Secondly, it is possible that creating these hybrids impacted positively upon teacher behaviour at other times, in their own classrooms.

If we accept that there is a place for hybrid innovations, it is worth noting that some of those that emerged at Longford School appeared to be effective. In such a highly pressured context, a hybrid that resolves conflict for teachers regarding the narrowness of the object could prove valuable and educators seeking to implement SOLE, or another innovation, could thus learn something useful from the more effective hybrids that evolved. The adaptations Teachers A and H made were described in detail in Chapter 5 and will not be repeated here, but clearly both teachers were confident that, during their SOLEs, students would engage with some of the knowledge they needed for high stakes tests so they did not experience conflict between their motives. Indeed, they both used SOLE with students who were close to taking such tests, as well as younger students in the school. This confidence arose from the fact that they spent considerable time planning their SOLE sessions. For example, Teacher A explained the process by which she refined questions, which included typing them into a search engine and exploring the results that were found, and Teacher H created additional resources, such as the Question Wheel (Appendix I), to support student learning, as well as writing a list of questions to help guide the debrief. Thus they were confident that, as with any other lesson, the SOLE would enable students to achieve what they intended, even with reduced input from themselves during the session.

There is also evidence of an effective SOLE hybrid that has developed in two schools in Australia. Here, SOLE has been adapted to work in slightly different ways, partly because the schools are the equivalent of primary schools in England. The headteachers of the schools, Kenna and Millott

(2017), outlined the changes that they made to the SOLE process described in the toolkit (2014a). For example, they have explicitly planned how SOLE should be integrated into the curriculum by developing a learning sequence which begins with students building 'collective knowledge' through SOLE, then requires them to negotiate how they will provide 'evidence of our learning' before the 'application of knowledge' stage whereby they complete the agreed upon task which is likely to take a traditional form, such as creating artwork or producing creative writing. To support teachers in planning these learning sequences, they have developed a hierarchy of questions which they describe as a planning protocol or tool (Kenna and Millot, 2017, p.118). This encourages teachers to build layers of questions around one topic, starting with closed questions that are appropriate to a knowledge acquisition approach (Sfard, 1998) and working towards questions which challenge students to create knowledge by forming an opinion or solving a problem. A second adaptation is called 'Vocab Catching' (Kenna and Millott, 2017, p.114) and this aims to capitalise on the opportunity for students to develop their literacy through SOLE. During SOLE, and at other times, students are asked to add new words they encounter to a shared list of vocabulary which is displayed in the classroom. Some of those words will subsequently be incorporated into other work that students do and some will also be added to a list of spellings that students should memorise. Finally, the SOLE strategy at these schools incorporates both teacher and peer feedback which aims to support the development of effective learning behaviours (*ibid.*, p.115). Kenna and Millott (2017, p.122) explicitly state that this approach enables teachers to simultaneously achieve the dual motives that have been described in this research as driving SOLE use, because it offers, "the opportunity for students to explore, create and be excited whilst still maintaining that line of sight to the curriculum".

Overall, it is clear that Teachers A and H, together with those at the Australian schools, were able to create versions of SOLE that were aligned to the concept of students self-organising but also supported them in working towards the object. It is difficult to argue that these hybrids were not more effective than the original innovation in context. Evaluation of whether SOLE hybrids were more effective than teachers' existing strategies was beyond

the scope of this research, however Teachers A and H clearly believed that they were enhancing their own practice because they persevered with a process of reflection and refinement. It is significant that these teachers were both among the most regular users of SOLE and they were confident enough about its value to be observed facilitating SOLE by senior members of staff. This resonates with the experiences of Kenna and Millott (2017) who found that reflective, evidence-based adaptations of SOLE greatly enhanced the process in the context of their schools and made it both effective and sustainable. In a context that is so narrowly focused on particular learning outcomes, carefully designed hybrids might be the only possible option for developing innovative practice within teacher's classrooms in a sustainable way. The reasons why these teachers were able to create effective hybrids will be considered in more detail in the final section of this chapter.

- ***Implications for Introducing Innovations***

Although any conclusion about whether SOLE use was sustainable might be open to interpretation, the findings of this research are particularly interesting because the contrasting approaches of the two schools significantly affected the extent to which sustainability was possible. Any educator hoping to appropriate an innovation within their own context could use these findings to inform their decisions prior to implementation. At Hillside School, the SOLE framework was highly valued by the headteacher as a way to potentially impact upon the behaviour of educators. He did not perceive this shared object to clash with the object of the education activity system because he believed that SOLE was a tool that would support teachers and students to work towards that object. In reality, this was either not borne out by teacher's experiences, or they did not recognise the problem that SOLE was intended to address (Cohen and Mehta, 2017). The kind of hybridized SOLEs that emerged at Longford School might have resolved this conflict, but in this context they would have been taken as evidence of the innovation's failure and, with such little capacity for action, teachers opted out of using it. Thus it is important for school leaders and teachers to be clear from the outset about whether hybridized versions of an innovation will be acceptable. If not, those introducing an innovation should ensure that

sufficient consideration is given to the extent to which it might support teachers in working towards the object of the activity system; failure to do so may undermine the innovation before implementation even begins. In the education activity system that exists in England at present, it is worth noting that any innovation is only likely to be sustainable, in terms of regular use, if it helps students to achieve in high stakes tests (Solomon and Lewin, 2016). Where a fidelity (Fullan, 2007) approach is chosen, some training for teachers about how the innovation can support the object is therefore likely to be helpful.

An alternative way to ensure sustainability of an innovation is to encourage hybrid forms to emerge. This requires an acceptance that an innovation will not be fully implemented (Cohen and Mehta, 2017) and, as such, any impact may be reduced, however it makes it possible for teachers to resolve the conflicts that are likely to occur between the new innovation and the object of the system. Where conflicts can be resolved, the innovation is far more likely to be sustained in some form. Thus, the transitional actions (Sannino, 2008) which neither continue an innovation directly or abandon it completely, become the harbingers of change. Where this approach is considered desirable, it would be appropriate to train teachers about the pedagogical assumptions of the innovation and to encourage them to reflect upon which aspects of the process are effective in their context and which are fundamental to the innovation itself. The more teachers understand about why an innovation has been designed in a particular way, the more likely they are to be able to meaningfully adapt it. Such local engagement can make a significant difference when appropriating an innovation and a number of teachers who participated in this research either referenced other teachers who had supported them in getting started with SOLE (Teachers D and H), or articulated that it would be helpful to observe colleagues conducting SOLEs and to talk about strategies that could make it more effective (Teachers C and F). My findings suggest that teachers who engage with the epistemology that informs an innovation are more likely to find it an effective teaching and learning tool, which is crucial for sustainability. The importance of understanding the epistemological underpinning of an innovation will be explored in more detail in the final section of this chapter.

7.3.3 When is a 'SOLE' no longer a 'SOLE'?

Where hybrids of SOLE evolve, there arises the question of which components of Mitra's original framework need to be in place in order for a SOLE to be deemed to be happening. SOLE does not have one single feature that defines it, rather it is identified by a combination of elements, brought together under the principle of students self-organising. As these elements include activities that might be found in many other teaching strategies, such as use of the Internet and collaborative working, it can become difficult to distinguish between a SOLE and an alternative collaborative research task. Of all of the components of Mitra's SOLE I would suggest that the most defining feature, perhaps because it is the one least likely to be found in a typical secondary school classroom, is that of students being empowered to both move around as they choose and change groups if they wish. While many teachers provide opportunities for collaborative working, and it is not uncommon for students to be allowed to choose their own groups, there is usually an assumption that students must remain in the same groups for the duration of a task so that teachers can monitor the work done and the progress made. Indeed, this was evident during this research, for example Teacher F mentioned the difficulties created during the debrief when group composition had changed and some teachers told students to remain in the same groups as previously (Observation 16). However students having permission to change groups is not, alone, sufficient to say that a SOLE is happening.

Based on more than forty-five SOLE observations, conducting SOLEs of my own and comprehensive research into how educators around the world have implemented SOLE in a range of contexts, I would suggest that the following components must be present for an activity to classify as a SOLE:

- Open-ended task, usually a question, that requires knowledge creation (there is not an existing agreed-upon answer)
- An expectation that students will offer the best answer they can to the exact question asked; simply repeating information they have found is understood to be insufficient

- Some freedom of movement, for example if teachers choose groups, students must be able to move around to share information
- Fewer computers than students so that some collaboration is almost inevitable
- Resources that do not provide a single right answer and which are likely to include the Internet

In table 7.1 I have contrasted these requirements with the equivalent guidance given by Mitra in the SOLE Toolkit (2014a). As can be seen, they do not differ greatly from the original framework, rather they delineate the most restrictive form that SOLE can legitimately take.

Minimum Requirement for SOLE	Mitra's Guidance on SOLE
Open-ended task, usually a question, that requires knowledge creation (there is not an existing agreed-upon answer)	"Students are given a big question, or are challenged to think of their own" (p.7)
An expectation that students will offer the best answer they can to the exact question asked; simply repeating information they have found is understood to be insufficient	"Groups are expected to present what they have learned at the end of the session" (p.7) "Encourage debate. Facilitate a discussion about the question itself and their investigation process." (p.15)
Some freedom of movement, for example if teachers choose groups, students should be able to move around to share information	"Students choose their own groups and can change groups at any time" (p.7) "Students can move around freely, speak to each other and share ideas" (p.7)
Fewer computers than students so that some collaboration is almost inevitable	"One computer per four (approx) students. Limiting the number of computers ensures peer learning and collaboration which is an essential aspect of the SOLE experience." (p.12)
Resources that do not provide a single right answer and which are likely to include the Internet	"Internet Access" (p.12)

Table 7.1 A Contrast of the Minimum Requirements for SOLE with Mitra's Guidance

These suggestions are an accumulation of all the work that I have done to understand SOLE. I recognise that, even within these guidelines, there is still scope for much variation in the divisions of labour that might arise in individual classrooms. However, I believe that the hybrids created at Longford School demonstrate that there is value to using some form of SOLE

in a highly accountable secondary school context, not least because it gives students an opportunity to control their own learning which can be a useful method of both engaging and motivating. The examples of effective hybrids of SOLE developed by Teachers A and H, that have been presented in this research, would be good starting points for any practitioner and I would recommend reflecting on the choices they made in their particular contexts in order to identify how similar adaptations might be applicable elsewhere. In Appendix J I have included a more detailed description of the features that I consistently observed in the most effective SOLE sessions as a starting point for any educators interested in trying SOLE in their own context.

7.3.4 Conclusion

In this section, I have explored how local contextual factors can either support or prevent the evolution of hybrids of innovations, with a particular focus on why hybridised versions of SOLE were prevalent at Longford School but non-existent at Hillside School. I have also discussed the extent to which SOLE, as an innovation, was sustainable in both schools, with reference to different definitions of sustainability from the wider literature. Based on my findings, I have cautioned educators to carefully consider the approach they take to implementing innovations of their own; what they choose to prioritise will significantly impact upon appropriation. I then discussed the value of hybrids, concluding that, within the educational activity system that exists in England at present, they may be the only viable option for developing innovative practice within secondary schools. I used the findings from this research to tentatively suggest that, where they are thoughtfully refined by teachers, hybrids can be used to enhance teaching and learning. I ended this section with some consideration of the components of a SOLE which must be retained in a hybrid in order for it to legitimately be considered a 'SOLE'. In the following section I will begin to explain why the hybrids created by Teachers A and H appeared to be more effective than others.

7.4 Epistemological Fog

7.4.1 Introduction

It was notable from my findings that so many teachers, despite being motivated to use SOLE, struggled to make it work in a way that satisfied their

dual requirements. They either left students to learn independently, which meant that they did not achieve the desired outcome regarding students engaging with the required content, or they intervened in the learning, so that appropriate content was covered but students were not self-organising in any meaningful way. By contrasting the differing approaches of the majority of teachers with the two individuals at Longford School who were able to adapt SOLE effectively, and with reference to the schools in Australia where they have done the same, I have come to understand this as an epistemological issue which, building on the work of Leat, Thomas and Reid (2012), I have characterised as an 'epistemological fog'. In this section, I will first consider the epistemological assumptions that the majority of teachers took with them into SOLE and explain why these were not appropriate for SOLE use. I will then consider the differences in how Teachers A and H, at Longford School, understood SOLE and show that this enabled them to adapt it to work more effectively. I will finish with a discussion of what the epistemological fog means in this context and the implications for teachers or school leaders who want to implement innovations.

7.4.2 Appropriation of SOLE by the Majority

As was evident from my findings, when teachers used SOLE they were trying to satisfy two motives. The first, which appeared to drive teachers to use SOLE at any particular time, was the opportunity for students to learn more independently as a form of resistance to the continuous focus on high stakes tests that was usual; this resolved a conflict for teachers between the object of education and their beliefs about what else education should offer. The second motive, also significant because it was dictated by the high accountability framework within which teachers acted, was that students would learn a particular aspect of subject content. When teachers chose to use SOLE they appeared to recognise an opportunity to satisfy the former motive without detracting from the latter, for example where content appeared to lend itself to a more exploratory approach,

"I think it's wherever there's an opportunity for kids to explore something themselves and, the way I view it is, if there's not really a, not necessarily credible, but a concrete answer to something, or it allows them to have that opportunity to explore. I think as soon as you've got something where there's almost like a set belief or a set sort of theory

about it, and where it's difficult to argue against that, I think it becomes less useful." (Teacher B)

Teacher B's comments reflect what many teachers said, specifically that there were times when it was appropriate to use SOLE, such as when there were a range of answers or theories to explore. In this way, SOLE use would not detract from preparing students to pass high stakes tests therefore teachers could prioritise their motive to provide students with alternative learning opportunities without jeopardising outcomes that would work towards the object. They were thus hoping for two separate outcomes, but there was little evidence of teachers thinking about how either might be achieved within SOLE. Indeed, there was little suggestion that teachers recognised the fundamental shift in what students were being asked to do, in terms of moving from acquiring information from an expert source, to constructing an answer themselves to a question to which a widely accepted answer was not available. In the extract above, Teacher B noted that it was better to use SOLE where there was not one right answer, so there was some understanding that students were no longer learning from an expert source, however he appeared to formulate this solely in terms of student engagement. When discussing what made a SOLE successful he explained,

"I think it depends on the engagement of the kids in that topic, how much information's out there, how much ability there is to formulate their own ideas. So there are one or two SOLEs where, I don't know maybe the answer is a bit more clear cut and therefore it's quite quick. It serves a purpose, but principally the kids find out similar things. Easily the best SOLE we do here is the JFK conspiracy SOLE because there are still dozens of programmes on the television about it, the different people saying different things, historians saying different things, there are obviously official versions, but that I think is the one the kids really like because he's the President of the USA, it is something they find interesting. There are a lot of things they can access in terms of online video footage, which I think they find really interesting, and because of those reasons, it's not just text, I think that that sort of allows the kids to get more into it if you like." (Teacher B)

He stated that there was a wide range of source material and that students were required to piece that information together, yet he did not appear to recognise that this implied a completely different understanding of knowledge to that which students were used to. He simply interpreted this as a way to engage students in the subject matter. This was representative of

the majority of teachers at both schools. They believed that it was their responsibility to find a question that would engage students, because that would contribute to the SOLE being effective, but beyond that they considered it to be the students' responsibility for making SOLE work. There was no understanding that students were being asked to learn in a fundamentally different way to that which was typical in their usual classrooms or that they might have a role in supporting students to make that change.

Most teachers appeared to trust that SOLE would work if they did it correctly, which resonates with Bussis, Chittenden and Amarel's (1976, cited in Fullan, 2016, p.31) conclusion that teachers "provide the classroom with rich materials *on the faith* that they will promote certain learning priorities" (emphasis in the original). Mitra gave talks about his HiW experiments to staff at both schools and, having heard him speak about children learning with minimal adult intervention, the teachers who were interested in using SOLE appeared confident that it would work for them too. It seemed to be widely accepted that, simply by giving students access to SOLE, both content learning and developing as independent learners would be natural by-products of the experience. Perhaps because they knew that children in places such as Kalikuppam had learned with minimal adult intervention (Mitra and Dangwal, 2010), most did not appear to reflect on their own role in supporting such learning, apparently assuming that the process would be more valuable for students without any involvement from them. This was compounded by the way that they interpreted the guidance in the SOLE Toolkit (Mitra, 2014a), which effectively outlines a behavioural framework as the rules describe what students should be free to do during a SOLE, particularly in terms of collaboration (*ibid.*, p.7). When taken at face value, as many teachers appear to have done, they simply provide guidance on the student behaviours that teachers should not only permit, but encourage, with no consideration of the underpinning epistemology or its pedagogical implications. The guidance on how to run a SOLE (*ibid.*, p.15) is a timed overview of a session with little consideration of what a teacher should be doing during that time, beyond standing back, so that teachers were reduced to guessing the behaviours that might be expected of them. At Hillside School

this translated into being physically absent from the room and at Longford School this was understood to mean the smallest amount of teacher intervention possible. Using Zhang's (2011, p.263) continuum of procedure to principle-based reform, this was an example of a procedural-based approach: "A scripted, proceduralized approach specifies tasks and activities, the order and form they should take, and the tools and resources to be used." This perfectly encapsulates the nature of SOLE as it was understood by the majority of teachers at both schools. The language they used to talk about SOLE facilitation, as discussed in detail in Chapter 6, showed that they understood the rules to specify what should happen and when and that they felt constricted by them. Where teachers interpret an innovation in this way they are likely to reduce new learning models to their surface features (*ibid.*) as they come to believe that the procedures themselves represent the whole purpose of the innovation. This was evident in both schools during this research, where it was clear that many teachers could "value and even be articulate about the goals of the change without understanding their implications for practice" (Fullan, 2016, p.31). Thus not being present in the room characterised SOLE at Hillside School, just as minimal teacher intervention did at Longford School, and any epistemological implications arising from the SOLE Toolkit (2014a) did not appear to be considered.

- ***Why was this lack of Epistemological Understanding Important?***

It is difficult to overstate the extent of the epistemological shift that SOLE represented from typical secondary school teaching activities. In a system dominated by convergent assessment (Torrance and Pryor, 1998) which reflects an understanding of learning that closely aligns to the acquisition metaphor (Sfard, 1998), SOLE represents a significant departure from that conceptualisation. Knowledge is no longer private, nor is it something that can be acquired from an expert source or something that exists independently as an objective right answer. As such, it contradicts the assumptions that the accountability framework, and thus the vast majority of learning activity, is predicated on: a "paradigm shift" indeed (Leat, Thomas and Reid, 2012, p.401). Where teachers only really understood the surface features of the innovation and there was little engagement with what the

purpose of some of those features might be, the extent of the shift was not apparent to them. As a consequence, SOLE was appropriated as a behavioural framework rather than an epistemological, or even pedagogical one and teachers approached SOLE with assumptions that were relevant to the acquisition metaphor which framed the majority of their practice. This impacted significantly on appropriation, for example teachers sometimes insisted that students stayed in the same groups during SOLEs, particularly where they spanned more than one lesson. This reinforced an understanding of knowledge as private and suggested that acquiring it was a competition. In addition, this expectation demonstrated that students were accountable only for the answers that they and their groups had prepared, which suggested that success would be measured according to the acquisition of knowledge by an individual, or small group, and that this was more important than sharing knowledge to assist a wider co-authoring of a collaborative answer. Teacher responses to students who shouted answers out during SOLEs were also revealing because they often told students to be quiet or to keep their answer to themselves. While this was essentially a reflex response to their usual NDS in a classroom, where knowledge is private and the teacher's power is made explicit by controlling who can speak and when, it nevertheless served to reinforce an epistemological stance where knowledge was private property and learning was a form of competition. Also evident in some SOLE sessions was the emphasis on there being a 'right' answer. Teachers tended to try and disguise this with a question that seemed open and unrelated to the actual information they required, similar to the 'pseudo-open' questions that Torrance and Pryor (1998) suggest are common in convergent approaches, but even then some teachers were observed explicitly telling students that they were looking at the right information. For example, in Observation 4 the question posed was 'How are these pictures linked?' and the pictures were of a snail shell and a sunflower. On the surface the question was open, but in reality the correct answer, the knowledge that the teacher required students to acquire, was the Fibonacci Sequence; an epistemic stance reflecting knowledge acquisition was clearly apparent. As a result, SOLEs were often reduced to a research task, searching for the pre-existing correct answer, rather than an authentic opportunity for students to try and build their own

answer to a genuinely open question. The assumption that there was a correct answer was prevalent because most teachers had a mental list of content that students should access during the SOLE and the more of this they shared in the debrief, the more successful the SOLE was deemed to have been. This fundamentally undermined the epistemology of SOLE, yet was pervasive, impacting on the questions asked, the interventions made during the session (at Longford School) and the way the debriefs were managed. During those debriefs, the majority of teachers asked for students to share what they had found, as opposed to asking them to answer the exact question posed, which implied that any information they had acquired was an appropriate outcome. They also accepted, even praised, information that had been copied and pasted from the Internet. In their efforts to encourage students, they therefore reinforced the idea that acquiring information was sufficient and that there was a right answer available for students, if only they could find it. This detracted from any expectation that students would engage with the information they found and use it to create their own knowledge in answer to the question.

Such adaptations to the SOLE approach had the effect of steering students towards acquiring the content required to prepare them for high stakes tests, as the object dictated, precisely as it prevented them from accessing the wider learning experience that teachers intended. This made it very difficult for teachers to manage SOLE in such a way that it could satisfy their dual motives simultaneously. They did not recognise the epistemological differences between their usual practice and SOLE and therefore were unaware that alternative pedagogical approaches were required. Instead, they defaulted to understanding knowledge just as they did in their own classrooms. At Hillside School, the fact that teachers could not mediate SOLE was particularly problematic because it made it ever more difficult for them to ensure that students achieved the outcomes that they required from the perspective of knowledge acquisition. The fact that SOLE was not deemed effective, according to the success criteria appropriate to a knowledge acquisition approach, was the main reason why SOLE was so little used at Hillside School, particularly for teaching high stakes tests subjects.

Every time a teacher acted in such a way that reinforced a knowledge acquisition approach, they fundamentally altered SOLE because they influenced the way that knowledge was both understood and valued. Gutiérrez, Rymes and Larson (1995, p.448) highlight the significance of a teacher's epistemic stance, which "helps define what counts as valued knowledge in this classroom and thus determines whose knowledge is constructed." Thus all of the small incursions that teachers made into the conceptualisation of what knowledge actually was were significant in reminding students that nothing had really changed from their normal classroom: knowledge was private, there was an objectively 'right' answer and they should aim to acquire that answer for themselves. This undermined the principal of knowledge creation and instead shaped SOLE into a task that was better suited to the epistemology of the wider activity system, but was arguably no longer a SOLE. It became distorted into little more than a research task in which teachers intervened to ensure students gained the specific knowledge they intended. The nature of those interventions, borne as they were from teachers' epistemic stances, did not develop students as independent learners or knowledge-creators and arguably they detracted from students' capacity to become either. As Paavola and Hakkarainen (2005) note, the epistemic agency of students manifests according to the nature of the activities that they undertake; the confused merging of a knowledge creation style task with a knowledge acquisition style outcome, as was prevalent at both schools, made it difficult for students to understand what was required of them. Thus, a lack of understanding of how to facilitate SOLE according to its inherent epistemology, combined with the dominance of the narrow object of the education activity system, made it difficult for SOLE to be effective in this context.

7.4.3 Appropriation of SOLE by the Few: Why Were Some Hybrids More Successful Than Others?

Despite the significant epistemological shift that authentic SOLE use represented, some teachers did appear to be able to navigate the change. The hybrids that Teachers A and H, at Longford School, were able to create were examples of this. They have been discussed in detail in Chapter 5, so the adaptations that they made will not be described again here. Instead, I will

discuss some of the pedagogical choices they made in order to illustrate how they were able to combine elements of knowledge creation with the predominant knowledge acquisition approach that was ubiquitous in the education system. This will begin to clarify why their particular hybrids were effective, where others appeared less so.

Both teachers seemed to recognise that a revised pedagogical approach was necessary for SOLE to be effective, which suggested that they were aware that it was based on an alternative epistemology, even if they would not have articulated it as such. It was notable that they did not conceive of SOLE in the procedural way that most teachers did, rather they understood it as ‘principle-based procedures’, whereby, “principles are made explicit and best practices are conveyed through pre-established activities and procedures that translate these principles into effective action.” (Zhang *et al.*, 2011, p.264). Thus Teachers A and H followed the general guidelines of a SOLE session, as outlined in the SOLE Toolkit (2014a), but they adapted the process within the parameters of the self-organising principle as they understood it.⁵ Teacher H was explicit about SOLE being,

“more of a model of learning, a way of learning, which good teachers can adapt and use appropriately – it’s just about self-organising”
(Teacher H)

In stark contrast to the procedural understanding of the majority, Teachers A and H reflected on the principles behind SOLE, which gave them a greater understanding of the purpose of the SOLE rules and led to them having greater insight about what might constitute an appropriate pedagogical approach. They therefore perceived an elasticity within the SOLE rules that was absent for their colleagues at both schools, even though they nominally recreated the same general experience.

⁵ It would perhaps be fair to argue, based on Teacher H’s interview data as presented in Chapter 5, that he got close to a ‘principles-based’ approach, where these “are made explicit and presented as pedagogical design parameters with teachers and students engaged as innovators and developers in a research-intensive process to develop and continually improve principle-based practice.” (Zhang *et al.*, 2011, p.264). See particularly his comments about merging SOLE and Project Based Learning. However, as the SOLE observation undertaken with this teacher adhered to the general procedures of SOLE that all teachers followed, I have classified him here as taking a ‘principle-based procedures’ approach.

- ***Teacher A***

Teacher A's SOLE hybrid was notable for the dialogic approach that she took to mediating learning which meant she positioned herself as a learner alongside students, albeit a more knowledgeable one, rather than an expert with the answers. Thus she removed the assumption that there was a correct answer that she could provide and this gave value to knowledge that the students themselves might create. She would probe to the limits of students' understanding and challenge their reasoning, before asking a question which gently nudged them to either deepen their understanding further or to move in a slightly different direction. These were always optional. Maintaining such weak framing, whereby students made their own choices about the knowledge they created, was significant because it broke down the power structures that usually served to reinforce the teacher's epistemic assumptions. Without these, students were able to generate new ideas that were recognised as worthwhile. When she debriefed student learning at the end of the session, Teacher A modelled a collective authoring of information in which students were required to listen, build on or challenge each other's findings and offer their justified answer to the question posed. She began the debrief by asking for students' answers to the exact question, rather than allowing them to share a range of facts they had found that were relevant to the topic. This reinforced the idea that student answers were valued and repetition of information that already existed was not appropriate in this context. Managing the debrief in this way reflected Paavola and Hakkarainen's (2005) description of the advancement of shared knowledge within a community. The SOLEs observed with Teacher A were notable for the way that students interacted both with each other and with the information shared, particularly during the debrief, and they always resulted in some content learning that was relevant to the curriculum, together with some that was not.

Teacher A did not disregard an acquisition approach to knowledge altogether; she was ultimately bound by the same object as other teachers and retained a focus on high stakes tests preparation. In order to ensure that SOLE sessions supported this, even while enabling students to engage in a

knowledge creation task, Teacher A thought carefully about the questions she posed. For example, in one SOLE (Observation 18) the question posed was 'Whereabouts in Newcastle should you live if you want to be a successful criminal?' This question suited a knowledge creation approach because it provided students with an opportunity to generate new ideas by answering a question to which there was no existing agreed-upon answer. Yet by carefully planning the question, she ensured that students would manipulate some of the information that they needed for high stakes tests, such as the links between population density and crime, an understanding of the different types of crime that are prevalent depending on the economic index of an area and the Zone of Transmission model. While such information helped students to create answers to the question and were part of the evidence they used, they were never the answer in and of themselves. As a result, students were engaged in creating knowledge about where successful criminals might live in Newcastle, while simultaneously acquiring the content that they needed for high stakes tests. The questions themselves were therefore vital and Teacher A described how her understanding of a good SOLE question had developed through practice and reflection,

"I can see now, a year in, why my questions are better than they were a year ago ... a question in a discussion forum in a lesson is very different from a good SOLE question and I think that it's taken me a while to realise what a good SOLE question is. But I've picked up things along the way like Google the question and make sure that there's not a website that is dedicated to specifically that, or if there is, then you can have a discussion about why that website might not be the best thing in the world. But I don't necessarily think that every SOLE question that I'm going to make up from now until the end of time will be amazing, because ... [in a recent SOLE] I just made the question far too cryptic."
(Teacher A)

Here, Teacher A describes the trajectory of her understanding of SOLE, hinting at a growing clarity about the alternative epistemology on which it was based. She had apparently come to understand that an effective SOLE question went beyond merely being an open, or even pseudo-open, question (Torrance and Pryor, 1998) as might be common in other classroom situations; she recognised that it needed to ask something different of students.

Overall, there was not one single thing that Teacher A did which accommodated the shift in epistemology, thus there is not a simple procedural solution that could be shared with all teachers. Rather her principle-based approach to Mitra's procedures imbued all of her actions so that she was continually reinforcing to students that the epistemology here was different. This was apparent through the question itself, the way she managed her own role during the SOLE and the modelling of a co-authored approach to the debrief in which the group collectively advanced shared knowledge. Finally, in recognising the changed epistemology, even if she did not articulate it in this way, she was also aware that students would need support to learn differently and she was confident about providing such support through mediation because she was not restricted by a purely procedural or behavioural approach to SOLE.

- ***Teacher H***

Teacher H's SOLE hybrid involved providing students with some structure and a different approach to the debrief at the end. Each time he facilitated a SOLE session, he reflected on the aspects that had worked well and those that had not and devised a strategy for improvement; just as we saw with Teacher A, he did not feel restricted by the SOLE rules so much as empowered by the principles. Teacher H did very little mediating during the main part of the SOLE, preferring to use a police person elected by the class, which meant that he vacated the role of the expert and effectively prioritised the knowledge that students generated. He also deliberately promoted the advancement of shared knowledge by individuals within a community through his question template (Appendix I), which encouraged the class to break down the 'Killer Question' into smaller questions that they could answer which would help them address the big question. This meant that groups of students focused on solving smaller problems, which would be used to construct a shared answer to the big question during the debrief. Teacher H described this process, where the question template,

"just immediately organises, everyone's got an area that they're looking in and it's all going to come together so from the original question going outwards into lots of different subject areas and then coming back at

the end to one big question. And I think that kind of way works well.”
(Teacher H)

Although implemented differently, this shares commonalities with the hierarchy of questions described by Kenna and Millott (2017) in which greater cognitive demands are made on students the higher they move through the hierarchy. They describe this as a planning tool for teachers which can be used to support students to move from basic fact finding to more cognitively demanding SOLE questions such as those requiring problem solving. Teacher H incorporated a similar hierarchy within each SOLE session by reducing the cognitive demand during the research phase of a SOLE but then greatly increasing it in the debrief, when he was available to support students to form opinions or solve problems. He was dismissive of the value of a ‘present and praise’ debrief, which was more appropriate to a knowledge acquisition approach,

“what I’m arguing is that a lot of SOLE lessons don’t have that [learning], they just stop with ‘this is what I learned’ everyone have a clap, you’ve presented information. That doesn’t mean you’ve made progress, that means you’ve written stuff down. What is the real measure of progress? Being able to see that they can argue and fight for the learning that they’ve actually done” (Teacher H)

He recognised that acquiring information, or writing it down, was an insufficient SOLE outcome and argued that students had to do something more for meaningful learning to happen in this context. Although the language he used is different to that of knowledge acquisition or creation, the similarities of meaning are clear. Thus Teacher H modelled a more demanding approach to the debrief, encouraging collective knowledge creation based on the evidence found during the session. He described how sometimes he required the whole class to present him with just one consensual answer to the question, facilitating a discussion in which all students had to share the information they had gained and justify their ideas around the big question to construct a shared answer. The debate style approach that he preferred also encouraged students to challenge each other so that they were all satisfied with the quality of their final answer and in this way he deliberately cultivated the types of learning behaviours that he believed were important. Thus, students were unable to simply repeat existing knowledge they had gleaned from the Internet, which reinforced the

fact that the usual acquisition approach was not relevant at this time, rather they were supported by the teacher, or other students, in developing a contribution to the answer they were collaboratively authoring.

Teacher H spent a lot of time planning SOLEs, just as Teacher A had, paying particular attention both to the question and to the way that he would facilitate the debrief. He wanted students to experience a different approach to learning but he was also focused on them encountering knowledge that was relevant to high stakes test preparation. Through consideration of the types of information that students were likely to encounter when answering the question, he prepared himself for the debrief in advance,

"I plan my lessons with a list of questions on the way I want it to go, but I don't have answers on the way I want it to go, I have further open questions that are going to be challenging the likely answers that I get, that will force them to be going in one direction where I want them to,"
(Teacher H)

The language he used here was strong and it is clear that he was not leaving the coverage of required content to chance. Rather he ensured that the question he posed initially was likely to result in student engagement with the content he required and he prepared appropriate questions that he could ask during the debrief to help them to use that content to create a shared answer to the question.

Teacher H accommodated the shift in epistemology that SOLE represented by ensuring that knowledge, in this context, was something that had been created by students, rather than a presentation of pre-existing information. This was particularly apparent during the debrief in which he required students to collectively advance their understanding through a co-authored answer to a question. He supported students through the changed epistemological approach by providing tools that enabled them to break down the process of knowledge creation, but was able to do so without detracting from the principle of self-organisation that he recognised as being fundamental to SOLE.

- ***Australian Schools***

It is worth noting that the leaders of the schools in Australia (Kenna and Millott, 2017), where SOLE appears to have been embedded, offer similar examples of the pedagogical adjustments that are necessary for teachers to move between a knowledge acquisition and knowledge creation approach. They hint at the shift in epistemology, explaining that SOLE has resulted in a move towards a more divergent teaching approach (Torrance and Pryor, 1998). Similarly to Teachers A and H, they refer to SOLE in terms of the principles of self-organised learning, rather than procedures they are bound to enact, so that it is “carefully guided by the teacher whilst allowing space for the students to make decisions about what they will do.” (Kenna and Millott, 2017, p.123). They use the term ‘collective knowledge’ when talking to students to help them understand that they are a learning community in which everyone’s contribution is necessary and valuable. They state that students are required to use all the available evidence to come to a conclusion, one that is likely to be “an amalgam of their own viewpoints, researched knowledge and the shared views of other students.” (*ibid.*, p.119). This collective co-authoring, where knowledge emerges when it contributes to a shared advancement, resonates strongly with both a knowledge creation approach and the hybrids created by Teachers A and H. Finally, they also maintain a focus on the requirements of the accountability framework noting that they retain a “line of sight to the curriculum” (*ibid.*, p.122). In this way, SOLE is not reduced to a vehicle through which students can merely acquire knowledge, although that remains a feature of what they are asked to do. Instead, it is an authentic opportunity for students to collaboratively create knowledge, in the form of an answer to a big question.

- ***Commonalities Between Effective Hybrids***

When considered collectively, there are some common approaches within these hybrids of SOLE which accommodate the changed epistemology. Most significantly, the definition of knowledge changes so that it is not something to be acquired, it is something to be created. This is partly evident through the questions posed, but it is also reinforced through the interactions between teachers and students and an expectation that students must do

more than repeat information gleaned from the Internet. One of the main ways in which the teachers demonstrate this revised understanding of knowledge is by adapting their own role so that they are no longer positioned as an expert. They may know more than the students about the general topic, but they do not have an answer to the question posed and nor is there an accepted right answer for students to discover. This change in the teacher's role makes the weaker framing more authentic and thus the types of behaviours that are described in the SOLE rules (Mittra, 2014a) are naturally promoted and encouraged. The teachers maintain a focus on preparing students for high stakes tests, as the object of the system requires, yet the content that is inevitably the related outcome never becomes the end point of the SOLE. Instead, careful planning ensures that students will naturally engage with such content as part of the process of knowledge creation.

It is undoubtedly true that these hybrids, while reflecting the principles of SOLE, do not allow students to completely self-organise, but nor would such a SOLE be possible in this context. SOLEs in most English secondary schools are limited by the timetable, which dictates the amount of time students can spend on a question at any one time, the curriculum, which is broken up into discrete units that teachers are held accountable for and the teacher, who ultimately makes the decision that a SOLE will be done at a particular time and on a particular topic, even if they offer students some ownership of the question, (see Appendix A for a detailed overview of the practical challenges of using SOLE in this context). It is also clear, as discussed earlier in this chapter, that if SOLE use is to be effective, sustainable, or both, then it must be possible to use it to prepare students for high stakes tests. Ultimately the wider activity system imposes that object on teachers, in the guise of educating students, and the consequences for failing to take that into account can be punitive. Yet my findings would suggest that where epistemological assumptions are inherently understood, the principles of self-organising can be applied effectively in this context.

7.4.4 Epistemological Fog – What Does it Mean and Why Does it Matter?

At the start of this section I characterised the difficulties that many teachers experienced in attempting to appropriate SOLE as an 'epistemological fog'

(Leat, Thomas and Reid, 2012). This represents a failure to engage with, or understand, the epistemological underpinnings of a teaching strategy, which risks its purpose becoming obscured or distorted through appropriation. Fullan (2016, p.28) explains the importance of understanding innovations as multidimensional,

“There are at least three components or dimensions at stake in implementing any new program or policy: (1) The possible use of new or revised materials (instructional resources such as curriculum materials, standards, or technologies) (2) The possible use of new teaching approaches (i.e., new pedagogies, especially learning partnerships with students) (3) The possible alteration of beliefs (e.g., pedagogical assumptions and theories underlying particular new policies or programs).” (emphasis in original)

From my research, I would argue that this final point is fundamental and yet in both the schools here it was largely absent.

Epistemological underpinnings matter. They set the parameters for what it is possible to learn, so where different tasks have different epistemological assumptions, it is vital that the pedagogical choices of teachers reflect that. Although teachers may not have spent time reflecting on their own epistemological beliefs they will nevertheless have some, and an awareness of their epistemic stance is vital because it has been found to impact upon the choices they make regarding both teaching strategies and the curriculum (Olafson, Schraw and Vander Veldt, 2010). It seems likely that Teachers A and H had epistemological beliefs that aligned with the assumptions of SOLE, although it was well beyond the scope of this research to confirm or refute that. The fact that schools have become so dominated by an understanding of learning best understood using the knowledge acquisition metaphor can help to explain both why teachers are attracted to SOLE, implicitly recognising that it offers something different, and why they are unable to make it work effectively in the context, having become too embedded in an acquisition approach. The epistemological fog is this failure to either recognise or consider the way that an innovation frames knowledge, perhaps stemming from an assumption that there is just one type of learning which, in the current climate, is likely to be understood as a form of acquisition. As a result, new strategies are at risk of being (mis)understood through this lens.

Ultimately, an awareness that different learning strategies have pedagogical implications which require particular approaches is vital if innovations are to be successfully implemented so that they become more than simply procedures. Otherwise there is a risk that the “rituals designed to enable innovation might come to stand in its way” (Zhang *et al.*, 2011, p.265); I would argue this happened through SOLE appropriation at both Hillside and Longford Schools. Teachers’ epistemological beliefs may lend them faith that certain strategies, like SOLE, will achieve the outcomes they require, but neglecting to examine the epistemology underpinning those innovations could doom this approach to failure.

7.4.5 The Epistemological Fog: What Can be Done About it?

An epistemological understanding is vital for effectively facilitating learning activity, including new innovations, because there needs to be an inherent logic between the innovation itself and teachers’ interactions with students. Thus there was no single action that Teachers A and H took which made their hybrids more effective, rather their understanding of SOLE’s epistemological underpinnings imbued their pedagogical choices and their interactions with students. This cannot be translated into a procedure for teachers to introduce, it can only be replicated through engagement with the principles of SOLE to engender a similar level of understanding.

Therefore, educators looking to implement innovations need to recognise that they are asking for more than just the introduction of a new strategy. The most successful and sustainable approaches are likely to involve implementation of all three of Fullan’s (2016) components of innovation. As the materials and teaching approaches are often relatively straightforward to adopt and, certainly on the basis of this research into SOLE, are the elements of the innovation that are most likely to be evident in schools, it seems fair to assume that a greater focus on altering teacher beliefs might be beneficial. It is salient that Kenna and Millott, (2017, p.109) describe SOLE appropriation within a wider context of action research, peer observation both within and across schools and a process of engaging teachers in “conversations, reflection and feedback” where those conversations “became ongoing, threaded through the rest of school life.” Such an approach may not

guarantee that teachers will engage in reflection on epistemology but it makes it more likely, particularly where the individuals leading on the innovation recognise the significance of doing so. Incorporating opportunities for teachers to both reflect on their inherent epistemological stance and to engage in discussions about the assumptions of any innovation they are implementing, would be a useful starting point. The more teachers understand that everything they say and do in a classroom context reinforces a particular epistemology, the more they can consciously adapt their pedagogy and practice as appropriate. Elmore (2016, p.531) suggests that,

“When we are asking teachers and school leaders to do things they don’t (yet) know how to do, we are not asking them to ‘implement’ something, we are asking them to learn, think, and form their identities in different ways. We are, in short, asking them to be different people.”

Thus we should recognise that teachers who are moving from an acquisition approach to an alternative, be it participatory or knowledge creation, are being asked to do more than use a different set of procedures in their lesson. This is difficult, particularly where a teachers’ own epistemological beliefs are being challenged, or where they are comfortable with the role and strategies that they have previously found to be successful. A consideration of teacher identity and the emotional impact that may result from being asked to reconstruct that identity go beyond the scope of this research, but teachers at both schools certainly noted that they found this process difficult. Developing strategies for supporting teachers through such a process would thus be invaluable.

7.4.6 Conclusion

In this section, I have defined the epistemological fog as a lack of understanding of the epistemology that underpins a particular teaching strategy, which inevitably impacts upon its appropriation and likely effectiveness. I have shown that this was an issue in both schools as they appropriated SOLE because, where teachers did not engage with, or recognise, that the epistemology had changed, they were unable to facilitate the SOLE in a logically coherent way. Teachers attempted to graft a knowledge acquisition approach to learning onto SOLE practice, partly because they understood it as a set of procedures and partly because that

was the approach that they were used to. This fundamentally changed the learning that was possible. I have demonstrated how Teachers A and H were able to adapt SOLE effectively because they identified that different outcomes were appropriate and thus that alternative pedagogical approaches were required. They were able to avoid the epistemological fog to facilitate SOLE in a way that was consistent with a knowledge creation epistemology, without disregarding the object. Thus the reason why their hybrids were effective was because they were able to merge knowledge creation, which made SOLE effective and provided students with the alternative learning experience that teachers valued, with elements of knowledge acquisition, which enabled them to use SOLE to support high stakes test preparation. Thus they were the only teachers at either school who were able to use SOLE to simultaneously satisfy their dual motives. I concluded this section with a brief discussion of the implications of the epistemological fog for any educators who want to implement new innovations.

7.5 Conclusion

In this chapter I aimed to characterise the education system in England as a series of nested activities, incorporating, as a minimum, national government, school and classroom levels. I have suggested that the interaction between each level of the system is continuous but that the power distribution across the activities results in the national government agenda dominating at each level. At school or classroom level, the only visible exercise of power tends to emerge through resistance; I have argued that SOLE use took this form in both schools. I have also suggested that we need to explore alternative definitions of sustainability in the education activity system because faithful adherence to an innovation is likely to be very challenging for teachers unless it directly supports the preparation of students for high stakes tests.

Teachers appeared to be dissatisfied with the object of the activity system, which is essentially dictated to them from the national level, because it is so narrow and does not accommodate any other motives they have for engaging with the object. As a form of resistance, they developed hybridised versions of SOLE and, although these may be criticised as dilutions by some, they may be the only kind of innovation possible at present. SOLE appeared to offer a solution to the conflict that teachers experienced regarding the

representation of their motives within the object and, as such, effective hybrids could be valuable. This chapter concluded with a consideration of why some teachers were able to create more effective SOLE hybrids than others. Here, an understanding of the epistemological assumptions of SOLE proved vital in evading what I have understood as an 'epistemological fog'. This has important implications for those seeking to implement innovations in educational contexts; these will be discussed in the following chapter.

Chapter 8. Conclusion

8.1 Introduction

This chapter aims to conclude this study by reiterating the main findings and considering the implications for both research and practice. While this was a small scale study and thus generalisations should be made with some care, nevertheless it has highlighted some interesting issues from which tentative recommendations can be made. It is for practitioners themselves to assess the extent to which those recommendations may be applicable within their own contexts.

8.2 Main Findings

8.2.1 Power Distribution Across Nested Activity Systems

One finding of this research is the claim that the education activity system in England should be conceived of as a series of nested activities. Identifying an object, that which makes sense of the activity (Kaptelinin, 2005), is challenging yet it defines the whole activity system (Leont'ev, 1981, in Barab, Evans and Baek, 2004). During this research it became apparent that the object was educating students, as defined by high stakes test results, but this object threaded through different levels of activity from the creation of education policy at national level, into schools and classrooms. It was impossible to fully understand what happened during SOLE appropriation without reference to that national level, where the object initially emerged, and yet understanding the two as neighbouring systems was insufficient because of the level of interaction between them. Although it could be argued that the rules, tools and division of labour at the national level should have been understood as integrated into the activity system as it manifested at school level, this would have failed to account for the uneven way in which power was distributed and the impact of that. Thus, understanding the education activity system as being comprised of nested levels of activities enabled both the recognition that it centred around one object and an analysis of the distribution of power across those activities, where the national level effectively dictated the object of the school activity system. This was fundamental to understanding the factors that influenced SOLE appropriation.

Although the concept of nested activities is referenced occasionally in AT literature, as discussed in Chapter 7, it is an under-researched concept and existing studies tend to conceive of what I have understood as different levels of nested activity simply as context. There is little consideration of each node of the activity system within those layers of context. Although this study is limited by its small scale and, as such, claims to add to theory should be treated with caution, further research might consider whether this concept of nested activities has some use. I would also add my voice to those researchers who have questioned the absence of any discussion about the way in which power is distributed across activity systems (Daniels, 2004; Popova and Daniels, 2004; Davis, 2012) because that was vital to an understanding of SOLE appropriation here.

The most obvious recommendations for policy arising from this finding would be a reconsideration of some fundamental questions such as what we actually believe the purpose of education should be and the extent to which the current pursuit of high stakes test results is either beneficial or meaningful. Certainly this research found that teachers experience conflict when forced to work towards so narrow, and arguably unsuccessful (Kaptelinin, 2005), an object. Some dialogue around whether we currently measure what we value, or just that which happens to be measurable (Alexander, 2008), would be useful, as would a discussion about whether the performativity framework within which teachers and schools operate is distorting what we mean by education at the same time as it is putting unreasonable pressure on teachers. However, far more respected and experienced researchers than I have articulated these concerns for more than a decade, to little effect; this small scale research project is not going to influence policy where they have been unable to do so. Thus, a more useful approach is to focus on what school leaders and teachers might learn from this research. The main recommendation for practitioners is to achieve clarity about what can be changed and what cannot. The nested activity system is a useful way to explore the opportunities and limitations of what is possible; where the object is imposed by the national level of the system and enforced through various rules and tools, it is unlikely that school leaders will feel they have the capacity to effect much change. However,

understanding the use of innovations such as SOLE as a form of resistance creates opportunities. For example, creating space for such innovations outside of the accountability framework, as they did at Hillside School, might offer some form of conflict-resolution. Where educators wish to incorporate strategies such as SOLE into their wider practice, it is necessary to reflect on the ways in which that can be done effectively, such as through hybrids or transitional actions.

8.2.2 *Sustaining Innovative Practice in English Secondary Schools*

Another significant finding of this research is that there are ways to sustain innovative approaches to teaching and learning in a secondary school context, if we are prepared to define sustainability as something other than faithful adoption of a strategy (Fullan, 2007). While there is some debate within the existing literature about whether hybrids have value (Leat, Thomas and Reid, 2014; Cohen and Mehta, 2017), this research found that, where the principles underpinning an innovation are adhered to, the resulting hybrid can be effective. While SOLE may have been found to work well at primary school level (Leat *et al.*, 2011; Dolan *et al.*, 2013; Mitra and Crawley, 2014) the findings from Hillside School in particular suggest that it is simply not feasible at present to facilitate SOLE, as Mitra designed it, in a secondary school context. Ultimately, the ecology within which an innovation is introduced will impact upon that innovation, just as the innovation itself may impact on the wider context through a process of diffusion (Sannino and Nocon, 2008). The education activity system, as it manifests in secondary schools, cannot support 'pure' SOLE use, but these findings demonstrated that effective hybrids can be created, an example of context impacting on the innovation, and that experimenting with SOLE can lead to incremental change in teachers' wider practice, an example of innovation impacting on context. I made judgements about the effectiveness of SOLE hybrids based on what the teachers themselves wanted from SOLE, namely coverage of particular subject content and an opportunity for students to learn independently by self-organising. I also considered the extent to which the SOLE facilitated knowledge creation because this was fundamental to the SOLE process. The hybrids that Teachers A and H created were, in the judgement of this experienced teacher, far from weak forms of

implementation; they were more effective than Mitra's SOLE in this context. While the context itself, in particular the object, might be considered to be flawed, it is nevertheless the environment in which teachers must operate and therefore any innovation that disregards it is likely to be unsustainable.

Further research into the transitional actions that teachers take during the process of implementing innovations would be useful to unpick the extent to which diffusion occurs within and beyond a school setting. In particular, the extent to which the key features of SOLE, such as reduced teacher intervention, might impact on the framing of their usual classrooms would proffer useful data for school leaders who wish to make the kinds of wider changes to teaching practice that formed the shared object at Hillside School.

This finding has interesting implications for school leaders and teachers. Where introduction of an innovation is desirable, school leaders should clearly consider their priorities in advance and they should articulate those priorities to teachers. If faithful adherence to the innovation is considered vital, though I would question the efficacy of this unless it was developed in a secondary school environment, this should be made explicit from the beginning and careful thought should be given to how it can be used to satisfy the motives of teachers as well as the wider object. Where hybrids are considered acceptable, it is important that they are developed in such a way that they are logically consistent with the underpinning epistemology of the innovation.

8.2.3 The Epistemological Fog

The final claim I make from this research is that teacher understanding of the epistemology of an innovation is necessary in order for it to be implemented effectively and, developing a concept introduced by Leat, Thomas and Reid (2012), I have characterised the lack of any such understanding as an 'epistemological fog'. It was clear during this research that teachers were able to enact SOLE as a set of procedures (Zhang, 2011) and that the introduction of both the Internet as a resource and a less interventionist teacher approach could be adopted, albeit along a spectrum. What was rarely evident, and I would suggest was the main reason why the majority were unable to make SOLE work to satisfy their motives, was the recognition that their existing

assumptions about learning were invalid during SOLE. Thus the “alteration of *beliefs*” described by Fullan (2016, p.28 emphasis in original) was not even understood to be necessary. Consequently, a teacher’s epistemic stance during SOLE often undermined the process of knowledge creation that was fundamental to its purpose. Engagement with the principles underpinning an innovation, such as SOLE, is therefore key in determining whether that innovation is likely to be facilitated effectively and sustainable in the long term. As was evident from Teachers A and H, it is such an understanding that makes effective hybrids possible; this conjecture is supported by the literature on SOLE in the Australian schools.

Although the efficacy of these hybrids can be attributed to the teachers’ understanding of the epistemological shift that SOLE engendered, a weakness of this study is a lack of any consideration for why Teachers A and H recognised that shift where so many others did not. Understanding this would enable school leaders or teacher training providers to ensure that more teachers were skilled at making pedagogical choices that were consistent with the epistemological assumptions of an innovation. Failure to explore the reasons why some teachers appeared to implicitly understand the change in epistemology that SOLE represented has therefore limited the findings of this study.

The epistemological fog has some significant implications for teacher training institutions, school leaders, deliverers of CPD and for teachers themselves. Firstly, it is important that student teachers are educated around epistemology and how it links to pedagogy as well as being encouraged to reflect upon their own inherent assumptions. The more they understand about these areas, the more effectively they will be able to facilitate a variety of learning experiences in their own classrooms. This should be an integral part of all teacher training. Secondly, where school leaders want to implement innovative strategies, or where CPD centres around the introduction of such, requiring teachers to engage with the epistemic assumptions of those strategies is likely to result in more effective and sustainable implementation. A dialogue with teachers about the type of knowledge that is possible and how the innovation is designed to support a

particular type of learning might begin with a simple discussion of the purpose of the various procedural elements of the innovation. This will support teachers to conceive of innovations as principle-based procedures (Zhang, 2011). It could also lead into a discussion about how the epistemology underpinning an innovation may contrast with the assumptions inherent in the dominant activity, which would encourage reflection on how they might need to adapt their practice during facilitation of the innovation. Provision should be made for such dialogue to be ongoing, whether that is through coaching, time set aside in CPD for regular discussions or informal collaborations between staff. The identification of a 'right' answer here is not as important as the dialogue and the reflection that supports teacher understanding. It is through a process of trial and error that teachers are likely to refine their practice to be as effective as possible and, as such, action research could usefully support teachers through innovation implementation. Teachers themselves can follow all of the recommendations made here either from a personal perspective or, preferably, with a group of colleagues. School leaders who are keen to introduce an innovation could also usefully take heed of this guidance. I would recommend a simple checklist, like the one below, as a starting point before the implementation process begins:

1. What is the innovation? What appeals about it? What problem is it solving? What do we want students to gain from this?
2. Where will it be located? Are teachers' classrooms appropriate or does it need a separate space? If it needs a separate space, how can we ensure that it remains a central part of our teaching and learning strategy?
3. What are the epistemological assumptions behind this innovation? How does it position knowledge and what does that mean for the type of learning that is possible? How is that similar or different to the majority of teacher practice?
4. Are hybrid forms of this innovation acceptable in our context? If not, how can it be used faithfully while also achieving the outcomes we require? If it cannot achieve them, how will we create spaces where this innovation can be used?

5. If hybrids are acceptable, are there any elements of the innovation which must always be there? Why? How can those elements be retained while others are adapted?
6. How can we evaluate the effectiveness of this innovation? Are our usual methods appropriate? If so, why? If not, what else do we need to consider?
7. What mechanisms will be put in place to facilitate ongoing conversations about the innovation between teachers? Coaching, modelling, action research, or something else?
8. Who are the key people who understand the epistemological assumptions and pedagogical implications? How can we facilitate sharing their understanding in order to develop the practice of all teachers?

This is a starting point and is not necessarily comprehensive. However, such questions could form the basis of a carefully thought out approach to introducing innovation in secondary schools and is likely to make it both more effective and sustainable in the long term.

8.3 SOLE – A Reflection

SOLE was the starting point of this research and, although the themes arising from it go beyond SOLE itself, it is fitting that I return to it here while considering the implications of my findings. Despite the challenges that SOLE use posed for teachers in English secondary schools, sustainable use was possible. The fact that some teachers perceived of it as a form of resistance against an object that failed to account for their motives actually helped them to persevere with SOLE use, in spite of the conflicts they typically experienced as a result. Thus the national level of the education system, which exerted so much control and created such a pressurised context of performativity (Ball, 2003), also served to make some teachers more determined to incorporate SOLE into their practice. However, where the SOLE process was prioritised above a teacher's right to adapt it, competing centres of power created barriers to SOLE use that proved insurmountable. Where teachers could hybridise SOLE it was more likely to be incorporated into their practice, but the hybrids were often weakly implemented and

manifested as a confused mixture of knowledge creation task with knowledge acquisition outcome; those outcomes could be underwhelming. Yet the two teachers who appeared to recognise that the epistemological assumptions of SOLE were different and who understood it as principle-based procedures that were open to adaptation, were able to develop effective hybrids. These appeared to satisfy their dual motives of preparing students for high stakes tests while also providing them with a more independent learning opportunity and thus these teachers were able to evade the conflicts that affected the majority. While this research is currently the only such study about SOLE in a secondary school context, I am conscious that it has focused almost exclusively on teachers, with only minor consideration of how students experience SOLE. Further research on student perceptions would be beneficial.

It was from Sugata Mitra himself that I first heard about SOLE, during the CPD session at my school, at which time it was still in its infancy. Following some successful experiments in a local primary school he described a process through which students could learn without teacher support and I was inspired, if a little sceptical. Having spent much time researching SOLE and establishing a much wider understanding of the secondary school context, my findings would seem to suggest that SOLE as he envisaged it is not yet possible in that environment. Intrigued to see whether Mitra's thinking had similarly evolved, I shared my research findings with him. Interestingly, he concurred with what I have found here (see Appendix K for his full response), noting that there are more barriers to SOLE use in secondary schools than in primaries. As such, he suggested that hybrids are appropriate and that a definition of an 'adequate SOLE' might be useful to bridge the gap until the system of high stakes tests begins to incorporate the Internet. I am less optimistic than he that the wider system is likely to align with SOLE principles in the near future, but my discussion around the key features required for a SOLE to be happening, in Chapter 7, may be a starting point for that 'adequate SOLE'. I would also suggest that an updated version of the SOLE Toolkit (2014a) might now be appropriate, one which more explicitly positions SOLE within a different paradigm by articulating the principles of knowledge creation, together with some suggestions for how teachers can

operate within that epistemology. The list of features observed in effective SOLEs, as detailed in Appendix J, might offer a starting point for those suggestions.

8.4 Personal Impact

When I began this doctoral endeavour, I had been teaching in secondary schools for eight years. I was confident in my ability as a teacher, one who typically supported students to achieve well in high stakes tests but who also taught in a way that encouraged some student construction of learning. I assumed that this confidence would remain with me in whatever I chose to do. This perception was quickly shattered when I embarked upon my doctoral studies because for the first time in years I felt uncertain – of what was required of me, of whether I was capable of doing it and of whether I had made a big mistake in leaving teaching. I was conscious that the feelings I experienced as a result of not knowing what was expected of me, feeling ill-equipped to deal with the task I faced and being expected to navigate my way through with relatively little support were not dissimilar to how students might feel during their first SOLE; recognising the irony did not necessarily make me feel better. Although these feelings lessened as time passed, they were replaced with other concerns because the more I read about teaching and learning, the more I reflected on my own teaching practice and the more I questioned things I had done without thinking previously. In particular, reflecting on my own, limited, SOLE experience I had to accept that I was undoubtedly a weak implementer, engaging in SOLE with no consideration for the shifting epistemology and essentially forcing a knowledge acquisition approach to learning onto a knowledge creation task. Such realisations were not always comfortable and forced me to reassess my previous conception of my own teacher identity.

While I have learned an immense amount during this process, when I returned to work during the third year of my studies, I did not always find this helpful. At times I felt overwhelmed by the volume of information I now carried in my head, especially as the theory did not always seem to make sense in the school context in which I was working every day. My identity as a teacher is now far more complicated than it used to be and much less

assured, yet as I have settled back into my role I have begun to find ways to assimilate the things I have learned into my practice and, in the long term, my teaching will be better for it. I think it is fair to say that I am angrier about the wider educational landscape than I was before I embarked upon this process, which is partly the result of the greater understanding I have acquired through reading, partly because I have since had a child of my own who will one day have to navigate her way through the system, and also because in my new role as a senior leader I feel the pressures of accountability more keenly than ever. Yet I have also gained a far greater awareness of how to combat those pressures at a local level and of how to support teachers to resist the narrow form of education that the national government insists upon. This research has helped me to understand how I can provide students with the type of educational experiences that resonate with my own epistemic stance, without disregarding the wider object. Teaching is not the vocation for anyone who wants to achieve a sense of completion, of having become the best they can be at their job. It is a continuous process of adaptation, refinement and learning from mistakes. However as a result of this research, I am now better equipped for that process.

8.5 Final Comments

Albeit modestly, this research adds to both AT and to the literature around implementing and sustaining innovative practice in schools. It also provides the first detailed study of SOLE in a secondary school context. In the national education climate, where “what happens to be within the bounds of statistical computation comes to define the very nature of teaching itself” (Alexander, 2008, p.22), such a study is worthwhile because it is vital that those of us who wish education to be about more than simply achieving high stakes test results find ways to resist the narrow object imposed upon us. This study has made recommendations for school leaders and teachers who wish to introduce more innovative teaching and learning strategies, aiming to support educators to implement them effectively in context. In this way, the conflict that teachers experience should be reduced and an innovation is more likely to be sustainable. Such classrooms and schools will be able to offer our children more than a relentless focus on high stakes tests; it is my belief that we have a moral imperative to do that.

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Appendices

Appendix A. Particular Challenges for SOLE in Secondary Schools

Mitra (2014b) advocates SOLE as an opportunity for 'learning at the edge of chaos' yet in the English secondary school environment, chaos is generally considered to be indicative of failure. Schools can thus be a very hostile environment for SOLE as they are designed to thwart that which it requires to be effective: SOLE is about freedom and independence and big questions which explore many topics, whereas secondary schools rely on routines, conformity, timetables and a separation of subjects with corresponding division of accountability. While many of these conflicts also exist in English primary schools, where much of the early research suggesting that SOLE can be effective was conducted, they are undoubtedly exacerbated in the secondary context by some simple practical variances.

Perhaps the main difference between primary and secondary schools is the move from one teacher for almost all subjects, to different teachers as specialists, for each. Priestley, Biesta and Robinson (2015, p.114) observe that,

“secondary schools are hidebound by subject loyalties and constrained by the needs of getting young people good qualifications in these subjects ... Indeed it is a popular axiom in Scottish education that primary schools teach children, whereas secondary schools teach subjects.”

Such an observation would have equal validity in England. This practical change poses a significant challenge for SOLE because the separation of subjects results in a division of accountability which very strongly links the perceived success of a teacher with student performance in their subject alone. Thus the fundamental SOLE principle of student freedom to learn is compromised by the restricted agenda of the teacher; while they may be interested to listen to student learning on related topics, their focus is of necessity on what was discovered about their own subject. Within a bigger picture of curriculum narrowing (Berliner, 2011) and a hierarchical system of accountability it is understandable that teachers may not believe they have the luxury of valuing all learning equally and for its own sake. Inevitably, this pressure can lead teachers to focus on their own subjects.

The concept of teacher as specialist, within the context of an education system in which progression sees ever greater specialisation, is likely to be central to teacher identity (Bernstein, 1975). As students continue through school, they reduce the number of subjects that they study, which ultimately consolidates the links between a teacher and the subject matter to be taught. Thus even where a teacher poses a big question (Mitra, 2014a) which facilitates the crossing of subject boundaries, students will be aware of the curriculum focus required by that individual teacher. In this context SOLE is more problematic than in primary schools, where the teacher is responsible for student learning across most subjects and thus there is greater fluidity. Thus in a primary school, a question which leads students to simultaneously explore aspects of, for example, Science, Geography and History, can be developed meaningfully because the teacher leads lessons in all of those subjects. Whereas in secondary schools, the students are by default likely to explore within the subject matter that their teacher usually covers.

Division of subjects also results in greater inflexibility of time. Where students must move between different teachers for different periods of learning, education exists as a series of units of equal, if arbitrary, length which are divided up between different subjects according to a hierarchy that is largely dictated by assessment priorities (Berliner, 2011). Although the structure of the school day is something that schools have control over, in reality long-standing practices of timetabling are rarely questioned so that the universally recognised structure of a school week shapes “the schools’ responses to the curriculum rather than vice versa.” (Priestley, Biesta and Robinson, 2015, p.146). This inflexibility dictates that self-organised learning can only last as long as the lesson that the teacher has designated for SOLE, because when it ends their presence will be required by another teacher in another part of the school. This rigidity is challenging for teachers because it puts pressure on them to devise a question that is appropriately sized, not for the topic they wish to cover or the extent to which students might engage with it, but for the time available for that lesson. Some teachers may be concerned about the prospect that students might find answers quickly and they will be required to ‘fill’ the rest of the lesson, while others may be anxious that the time available is not sufficient to debrief what was learned

effectively. The intransigence of the timetable is less of an issue at primary level. Although there are still designated units that must be filled in particular ways according to government and institution guidelines, a teacher generally has much more control over class time and thus there is flexibility to adapt the length of a SOLE to suit both the children and the particular question asked.

By the time they reach secondary school, students are in their seventh year of formal education and are embedded in a system which prioritises assessment and grading as the key markers of success (Ball, 2003). They are not asked to learn because they are curious, rather they are expected to digest information deemed of significance by the creators of the curriculum and reproduce it in the most appropriate way for a particular assessment. As they move through secondary school they get ever closer to high stakes tests, the importance of which they are regularly reminded of, and they tend to be conditioned to believe that the system they are part of and the routinized behaviours they are comfortable with are the best way to achieve results in those tests; ultimately they have no other system to compare it to (Leat, Thomas and Reid, 2014). Thus taking part in a SOLE may not always be easy for students because it is so different to their usual learning experiences and they are not equipped to deal with the challenges, questions and issues that arise. During my pilot project observations, where the same class used the SOLE Room once a week for eight weeks, it was fascinating to see how students themselves not only chose to work in virtually the same groups for the entire project, they also chose to sit in the same places in the room each week, working at the same computers (Rix and McElwee, 2016). Thus the students themselves recreated the types of routines they usually conformed to in the classroom, in this instance a seating plan. It is not only the routinized behaviours that schools inculcate which make it difficult for students: their practiced habits of listening, reading and repeating information are not the only cognitive skills required to learn in a SOLE. At primary level students simply haven't experienced as much of the education system and thus normative practices are less ingrained. It is also likely that they have retained more of their natural curiosity as fewer accountability measures enable greater freedom of learning, although as content-heavy

testing begins to filter down through primary schools as far as Early Years education (Roberts-Holmes, 2015) perhaps this will not remain true indefinitely.

It is clear that attempting to incorporate SOLE in an English secondary school context faces a range of quite particular challenges which may pose additional obstacles for teachers, compared to their primary school colleagues.

Appendix B. Schedule of Questions for Teacher Interviews

- Have you used the SOLE Room (or SOLE)?
- Why did you choose to use SOLE? OR Why have you chosen not to use SOLE?
- How did you find the process?
- Is the process consistent with your usual teaching strategies?
- Do you think that teachers can become better at facilitating SOLE sessions?
- Do you think SOLE offers anything different to other teaching strategies?
- Do you think students see what happens in the SOLE Room as learning in the same way as they see learning in other lessons?
- How important do you think the SOLE Room is for the process?
- Do you think you'll be teaching SOLE sessions in 5 / 10 years time?

Appendix C. Overview of Participants' Contributions

HILLSIDE SCHOOL

TEACHER	SUBJECT	INTERVIEW	SOLES OBSERVED
Headteacher		YES	
1	Cover Supervisor		2
2	RE	YES	1
3	Art		1
4	English (Senior Leader)	YES	
5	Maths	YES	
6	Maths	YES	
7	Geography	YES	
8	Science (Science Leader)	YES	
9	RE	YES	
10	Maths		1
11	PE	YES	
CS x 2	Cover Supervisor		2
Emily	(Arts Centre Manager)	YES	1

LONGFORD SCHOOL

TEACHER	SUBJECT	INTERVIEW	SOLES OBSERVED
Headteacher		YES	
A	RE / Sociology	YES	3
B	History	YES	2
C	English / Psychology	YES	
D	Geography / iLearn	YES	4
E	Geography (Senior Leader)		1
F	Geography	YES	4
G	Maths / iLearn	YES	3
H	Health & Social Care / Food	YES	1
I	English	YES	1
J	Maths	YES	1
K	French		1
L	Maths		3
M	Maths		1
N	Maths		1
O	Modern Foreign Languages / iLearn		2
Q	Maths		1
R	Spanish		1
S	Design Technology	YES	1
T	Geography	YES	4
U	Modern Foreign Languages / iLearn		1
V	English	YES	
W	Careers	YES	

Appendix D. Teacher Information Sheet

Staff Information Sheet

Longford School: SOLE in an English secondary school

Background

As you will be aware, a SOLE room was opened in Longford School following Sugata Mitra's TED Prize win in 2013. This prize helped him to realise his 'wish' to create seven 'Schools in the Cloud' in India and the UK. These were intended to provide students with the opportunity to learn in an independent way using a method called SOLE (Self-Organised Learning Environment).

Sally Rix, a PhD research student at Newcastle University, is hoping to understand how SOLE is used at Longford School as part of her research. The information she collects will be used to inform her PhD findings and will also contribute to the wider research on SOLEs.

How will the research project work and who will be involved?

The information will be collected in the following ways:

- The researcher will hold informal interviews with some staff to find out their opinions on SOLE and to consider why they choose to use it (or not); these will be tape recorded with the interviewee's permission
- The researcher will observe lessons which take place in the SOLE room to identify how SOLE is implemented in practice in this context. Some lessons in the SOLE room may be video recorded but the only people who will have access to these videos are the researcher and her supervisors

How will the information be used?

The information will contribute to the researcher's PhD thesis and to a wider understanding of SOLEs. As such, it may be used in other academic publications.

All staff who take part will be anonymised; no names will be given. However, it is worth noting that the locations of the Schools in the Cloud are on public record, therefore some key staff (such as the headteacher and SOLE room co-ordinator) may be identifiable by interested parties. Please discuss with me if you are concerned about this possibility. Individuals will not be named in any written documents.

A summary of findings will be produced at the end of the research which participants will be welcome to comment upon.

Appendix E. Overview of SOLE Observation Data

Hillside School SOLE Observations

SOLE Signifier	Teacher	Subject	Participating Year Group	SOLE Question
A	1	ART (cover supervisor)	8	What do Aborigines believe came first – man or beast? What do they believe about how the world was created?
B	1	ART (cover supervisor)	8	What do Aborigines believe came first – man or beast? What do they believe about how the world was created?
C	2	RE	10	Does God exist?
D	3	ART	8	How do myths influence Aboriginal art?
E	Emily	N/A (nurture group)	7	What makes us human?
F	12	History (strike day)	Unknown	Why do we remember The Somme 100 years later?
G	10	Maths	7	What is a statistic and are they always true?

NB Teachers highlighted in grey were also interviewed as part of this research.

Longford School SOLE Observations

SOLE Signifier	Teacher	Subject	Participating Year Group	SOLE Question
1	I	ENGLISH	8	What makes a person who they are?
2	J	MATHS	11	How would you answer these AS questions and then teach them to other students?
3	K	MFL	9	Why do we speak different languages?

4	L	MATHS	7	How are these pictures linked to sequences? (snail shell & sunflower)
5	L	MATHS	9	If the earth was a giant malteser, how much chocolate would there be and how much malt (biscuity bit)?
SOLE Signifier	Teacher	Subject	Participating Year Group	SOLE Question
6	L	MATHS	7	How old is Maths?
7	M	MATHS	10	Assuming it was possible, how much fuel would it take to travel from pole to pole?
8	M	MATHS	8	How many trees would need to be chopped down to cover the whole of the planet Mars in toilet paper?
9	O	MFL	9	Why do we speak different languages?
10	A	RE	10	Do miracles happen?
11	A	SOCIOLOGY	12	To what extent are crime and deviance social constructs?
12	A	SOCIOLOGY	12	What do crime statistics really tell us about crime and deviance
13	Q	MATHS	9	How many oranges could you fit inside St James Park?
14	R	MFL	9	Why are there festivals in Spanish speaking countries?
15	B	HISTORY	8	Who shot JFK?
16	B	HISTORY	8	Who shot JFK?
17	S	DESIGN	8	What part did toys play in war?

18	A	SOCIOLOGY	13	Whereabouts in Newcastle should you live if you want to be a successful criminal?
19	T	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be?
20	G	iLEARN	7	What would Britain be like without Tyneside?
21 & 29	F	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be? (SOLE ran across 2 sessions)
22	E	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be?
23 & 28	D	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be? (SOLE ran across 2 sessions)
24 & 30	D	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be? (SOLE ran across 2 sessions)
25	T	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be?
26	T	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be?
27	U	iLEARN	7	What was here that isn't now?
28	D	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be? (2 of 2 - Obs 23)
29	F	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be? (2 of 2 - Obs 21)
30	D	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be? (2 of 2 - Obs 24)

31	F	GEOGRAPHY	8	If the UK was a sweet, what sweet would it be?
SOLE Signifier	Teacher	Subject	Participating Year Group	SOLE Question
32	O	iLEARN	7	Session cancelled on the day due to activities the head of department had requested be completed in lessons before the half term holiday.
33	G	MATHS	8	How long would it take to transport the earth's population to Mars?
34	T	GEOGRAPHY	9	Could India be the most powerful country in the world?
35	G	MATHS	7	How are these pictures linked to sequences? (snail shell & sunflower)
36	H	FOOD	7	When is it right to diet?

NB Teachers highlighted in grey were also interviewed as part of this research.

Appendix F. Teacher Consent Form

Adult Participant Consent Form

Hillside School: SOLE in an English secondary school

Name of participant:

Role: (e.g. teacher)

Before signing this consent form please read the information provided about the research project and your potential role in it.

I am over the age of 18.	
I have not been coerced in any way to participate in this study.	
I have been provided with a copy of the participant information sheet. I am satisfied with the information I have been given so far about the research and know I am free to ask any questions at any time before and during the study.	
I expect to be provided with outline findings by the research team once data has been analysed.	
I have been informed that the confidentiality of the data I provide will be safeguarded during storage and that reports or research articles will be written maintaining anonymity of participants.	
I understand that I may terminate my participation in the study at any point should I so wish, and I also understand my rights to withdraw my data without explanation and retrospectively, but only until the point that my data is anonymised.	
I consent to participate in this study.	

Name of participant
(print).....Signed..... Date.....

Name of researcher
(print).....Signed..... Date.....

If you want to know more about the project, or have any questions, please contact:

Sally Rix on [email address] OR call on [mobile phone number]

Appendix G. Example of Data Analysed Using Activity Theory

First Interview, Teacher, T
12th July 2016

So have you used SOLE? [Yes]. And why did you use it, the first time you went in?
 It was part of the scheme of work that was set up to – I'm trying to think what the first one was – it was 'If the UK was a sweet, what sweet would it be?' So they'd been doing the geography of the UK. We'd done a bit of that, and then they'd done the geography of the world. But then I got into the scheme of work to get them to develop their knowledge and use what they'd done in lessons, try and adapt that.

So you used it relatively continuously I think for a year?
 Yeah, towards the end of each unit that we've done. And a couple of times with Year 10 as well. With Year 10 I planned something differently to go in there, so they were looking at tourism and I did it last year as well – 'Does tourism change the nature of place?' – so I used that again this year because it helped them look at examples and see how tourism had changed, like Las Vegas especially they talked about that, so it was really interesting for them to look at that.

How do you find the process? What do you like?
 I like how it's independent and they can work in groups and collaborate on it and I think they're doing down more their way of thinking and how they go about things to do with the question, but I like for themselves and build on what they've done in lessons.

And is there anything you don't like?
 I find it hard to step back sometimes and I don't know how much to intervene, or to and keep the on task, or make sure they're doing what they should be. I find a lot of them just type the question into Google so I think I need to put more scaffolding in there. Especially with Year 8, just to help them – but then that goes against the stepping back.

Do you feel that some extra scaffolding is advantageous?
 Yeah I think it has been, especially with GC4 when I've been in there, I've broken the question down a little bit for them and talked about it before they've set off. Just because sometimes they go off looking at pictures or on a tangent, but it seems to be a bit more focused now. They've got better throughout this year, so that's been good with them especially.

Does that enable you to step back more?
 Probably step back a little bit more as the lesson goes on. I think at the start I'm a bit more hands on than I should be in the SOLE but then start to step back and let them come up with their own arguments or answers to the question.

Do students seem to enjoy it?
 Yeah, they love going down there. I don't know whether it's the novelty of the room or the computer and working together, but they seem to enjoy going down there.

Do you think it offers anything that you couldn't do in the classroom anyway?
 I've done a couple of SOLE lessons with iPads in the classroom, but I think you couldn't do it in a computer room. It's nice to have that big screen so they can all see what they're doing and focus on that, so that's good.

5.Rk
 Values the opportunity for student independence and collaboration.

5.Rk
 Division of labour is challenging, especially as students don't necessarily use that as the works their way of thinking and how they go about things, so I need how to support them within the framework – feels restrained by the SOLE rules.

5.Rk
 Scaffolds the learning a bit, but doesn't discuss that process with them. Feels this has improved – closer to the NKS now? More likely to fit the dominant object?

5.Rk
 Feels the idea of the novices there, which leads to her maintaining more control than she thinks she should.

5.Rk
 Perception is that students love the room / SOLE.

Does the whole SOLE thing – big question, let them get on with it, group work – does that fit with the kinds of things you do as a teacher anyway?
 Yeah I think it does because we have a lot of discussion about things, especially going from a local scale to a global scale, sometimes you don't have time to do it as in depth with the links, I think that's quite good in terms of geography so you can see how it applies to different places, different processes and how it impacts on different countries and people.

Is there anything that would stop you going and using SOLE?
 With some groups, I don't know if they get as much out of it as they could, either because of the novelty of the room or they use it as an excuse to maybe misbehave a little bit. But I think they get better, the more they're in there. I think the more they're in there, the more they're engaged, the more they're doing, or if they're struggling to find something then they start to drift off a bit from the task, or if they're struggling with the question, so that's normally when I step in.

And would you use it with all year groups?
 Yes, I've used it with all of them. I haven't had 6th form this year but I'll be quite interested to use it with them and see the difference and what the impact with them will be in comparison because some of them have used it quite a lot I think in Year 11 and 10.

Is there any time of year that you would avoid using it?
 No I think it's quite flexible, I've used it throughout the year. We try to use it at the end of topics but it might be quite interesting to do it at the start, especially with hazards so I think they've been using it a lot in the last couple of weeks. They'll look at examples and start to pull them together and finding out a bit more to improve the big question. So it'll be quite interesting to see how they get on with that one.

So you tend to use it at the end to consolidate everything – does that feel like its natural place?
 Well with China we did it in the middle and that worked quite well because then there's more of a discussion afterwards where they brought back what we'd done in the SOLE Room. It was about the one child policy, so they get a lot from that and that was in the middle, but it was more where it fitted in the scheme of work.

How do you decide where to use it as a department?
 I think it's just about the consolidation at the end, that's what we talk about as the focus towards the end. But with Year 10 I've used it in between, in the middle of topics, just depending, it hasn't always been at the end of topics. It's quite flexible at that.

Given that the teacher is meant to stand back, what is the teacher's role? What do you see yourself as being there to do?

5.Rk
 Students can take advantage of the division of labour to do things that they wouldn't do otherwise and they might prefer to do it. Clash with the dominant object might mean the doesn't use SOLE.

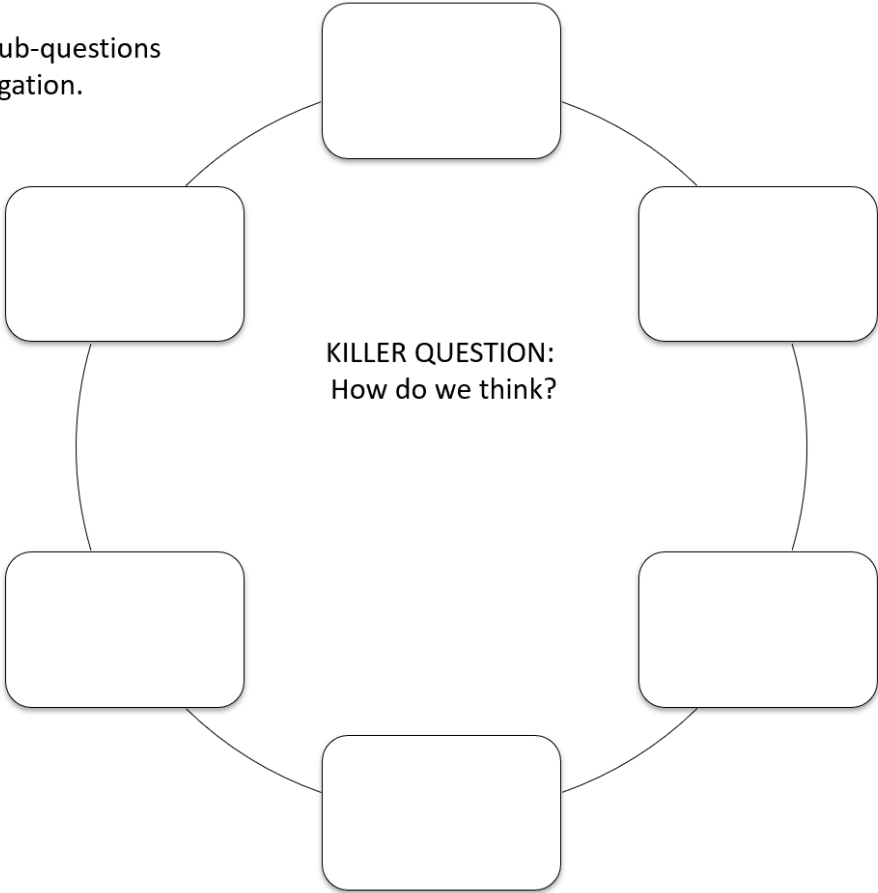
5.Rk
 Adaptation, intervention, recognises that they struggle rather than that they are poorly behaved and they're not doing it. They're not doing it on track, involves a negotiation of the division of labour.

5.Rk
 Has made it fit her context, Contractual agency?

Different colours represent different Activity Theory nodes and notes in the margin reflect development of coding, including nuance within AT nodes. Data 'lumping' and data 'splitting' (Saldana, 2009).

Appendix I. Teacher H's Question Template

Creating sub-questions for investigation.



Appendix J. Common characteristics of effective SOLEs

Preparation, planning and posing the question / task:

- The SOLE is planned carefully, including typing the question into a search engine and preparing questions that might be useful during the debrief.
- The SOLE question does not have a widely agreed upon answer. It requires students to create an answer, using factual information to construct a response.
- The SOLE is part of a wider learning experience. An opportunity for wider application of the information learned in the SOLE is planned in advance.
- The question is made sufficiently stimulating to the majority of students either through the way it is framed or the story told when it is introduced.

During the research phase:

- Students collaborate meaningfully to create new information, as evidenced by discussion, sharing and debate. Teachers prompt students to contribute.
- Students drive learning. They aim to find the best answer available and are not simply satisfied with 'an answer'. Teachers expect answers that students believe in and can justify.
- Teacher language is chosen to suggest, guide and encourage. It does not instruct students or insist: ownership remains with the students. All teacher questions and comments should arise from what the students are finding and thinking.
- Teachers facilitate the SOLE to ensure students are continually challenged to progress, for example by provoking discussion, setting up debates around different viewpoints, asking for evidence to justify assertions, expecting students to reconsider their answers in the light of new information and asking for an evaluation of the reliability of the information found.
- Teachers observe groups and are aware of the basic arc of students' learning and they use this information to make the debrief more effective, for example by informing the order in which students will share their findings.
- Opportunities for metacognitive conversations with groups or individuals may be taken during the session.

Maximising understanding during the debrief:

- Students share answers in the form of a discussion or debate, facilitated by the teacher, where knowledge is built upon and understanding is developed. This should not take the form of consecutive presentations where the same information is repeated.

The teacher should be explicit about what they want each group to do, for example 'Can you offer an alternative perspective to that?'

- Teacher includes some level of metacognitive reflection based on their observations during the session, such as a discussion about why one group was particularly effective. Not every group debriefs the process every time, rather the teacher uses specific incidents observed to introduce an opportunity for metacognition that might be pertinent to all, encouraging reflection on effective processes and impressive outcomes.

Appendix K. Mitra's Response to Thesis Findings July 2019

Finding 1: the wider education system is too dominant in English secondary schools to support authentic SOLE use. The pressure to get results is felt by teachers who consequently struggle to accommodate the unpredictable nature of SOLE. This is not because they don't think SOLE works or because they don't like it, it is just that the national education system is very dominant and very insistent that high stakes tests results are the most important element of a student's education.

I understand and agree with this finding entirely. In fact, the problem is worldwide. However, I get the feeling that governments, including here, are increasingly aware of the problems of 'standardised testing' (as it is called in the USA). Its just that they don't know what exactly to do about it and are nervous about the Internet. We need new assessment systems. Governments can't make those. We, academics, have to do this. As for SOLEs, they will not reach mainstream until the assessment system includes the Internet. This will happen eventually. At the moment, we need a definition for an 'adequate SOLE' that can make peace between the existing system and the freedom of SOLEs. I think most teachers agree that SOLEs work well and are useful in primary schools. There are even OfSted reports that say so! SOLEs in primary education should be advocated and encouraged.

Finding 2: due to the pressure described above, teachers are very reluctant to use SOLE if they cannot control the outcome. Thus where it is used regularly, teachers tend to adapt it in some way. This obviously impacts on the extent to which students can truly learn independently as their freedom is curtailed, but it does still shift the power dynamic in their favour more than most other teaching strategies. It is unlikely to be revolutionary when used in this way, but it does become sustainable. Where the wider education system is so stifling, this type of hybridised SOLE is probably the most successful outcome possible.

Spot on! I think SOLEs can be used as an effective tool for exam prep! Mediation is OK for such a 'hybrid' SOLE. Choosing groups is probably still not a good idea. It is best to explain to students that they can use the SOLE method for directed questions that are exam oriented. 'Solving' an exam paper could be made into an energising SOLE task.

Finding 3: many teachers do not understand the epistemology behind SOLE. They see the guidance, eg allowing students to move around, as rules of student behaviour, with little understanding of how learning might be impacted upon and developed as a result. This means they tend not to appreciate the point of co-authoring information / learning collaboratively etc. Some teachers do seem to recognise the value of the SOLE rules and the impact they can have on learning and are able to conduct SOLE sessions which are genuinely self-organised.

Good observation. Once again, I would add, this is a global problem. Indeed, it may be a little less in the UK than in other countries. I think SOLEs need to be incorporated into teacher training curricula along with practice sessions. The teachers who conduct SOLEs well should be made into evangelists for others. Some schools do so.