METALEARNING:

A CONTRIBUTION TO THEORY AND EMPIRICAL INVESTIGATION OF YEAR 4 PUPILS' REFLECTIONS ON THEIR CLASSROOM LEARNING

Paraskevi Mylona

UCL Institute of Education

University of London

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ABSTRACT

This thesis constitutes an original theoretical and empirical approach to metalearning (also known as learning about learning). Metalearning is defined as the learner making sense of their own experience of learning, with a view to improving their future learning. Making sense implies being aware of situational features (affordances and constraints) of one's context of learning, and accordingly regulating one's own cognitive, motivational, and affective attitudes towards learning in that context. The overarching aim of this sense-making through regulating these aspects is the construction of a metalearning strategy, understood as a set of attitudes and dispositions towards learning and the application of oneself to this learning. Strategies are open-ended, flexible personal constructions for personal improvement and effectiveness in particular contexts.

Lack of any existing empirical studies on how metalearning manifests itself in Primary pupils' learning in their classroom makes this research the first systematised effort towards understanding how a classroom cultivates its particular version of metalearning. This research addresses this issue in two ways: firstly, through a re-conceptualisation of metalearning with added emphasis on situativity; and secondly, through an empirical, interpretative, qualitative case study focusing on whether and how the pupils of a Year 4 Primary classroom make sense of their experiences of learning and use them to improve future learning. In this empirical project, emphasis is fully placed on pupils' voice as expressed in their qualitative interviewing, and in priority over validating theoretical constructions.

Central among the findings of this research is the evidence that pupils' metalearning strategies do indeed develop as a result of their interacting with their context; that they manifest as a range of qualitatively different perceptions and attitudes about what learning is, how it happens, and how it can be improved. These perceptions and attitudes form an intertemporal connection between who the learner is and how they apply themselves to learning in the classroom: reflecting on the past and present, and envisaging doing so in the future. Finally, issues of classroom language and learner agency emerge as seminal for pupils' construction of their learning self and their metalearning strategies.

I hereby declare that, except where explicit attribution is made, the work presented in this thesis is entirely my own.

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Chapter 1: INTRODUCTION

A. Personal Interest

My research interests and motivations are inextricably linked to my own learning journey of constant development: from pupil to student, and then on to academic researcher. My consistent understanding of myself as a learner has steered my research interests towards theories and praxes of learning, and my professional training as a Primary School teacher has bequeathed me with a particular yet consistent focus on this critically formative level of formal education.

This thesis essentially started during my BA studies at the National and Kapodistrian University of Athens with my choice of dissertation topic being on the provision of opportunities for learning in classrooms and pupils' utilisation of them. That small, quantitative study which indicated towards a particular class of pupils making the most and best use of classroom resources and practices, spurred my interest towards researching 'able/achieving' pupils' learning in classrooms.

My MA dissertation was completed in the IoE, and focused on a London school's Year 6 'gifted pupils' experiences of the Primary classroom' (Mylona, 2012). In this qualitative research, 'gifted' and non-'gifted' pupils described their experience of learning as differing in little else except in their understanding of learning and the way in which that understanding impacted the way in which they applied themselves to learning in the classroom. Pupils suggested that the way in which they perceived learning and being a learner were linked to their understanding of intelligence as fixed or malleable, and to the effort they deemed they should exert in order to achieve effectiveness. Additionally, they suggested that these understandings were linked to classroom conceptions of learning and being a learner, and resulted in different approaches to effective learning in the classroom. An insight on that finding which motivated further interest in research was the potential link between the teacher's nomination of a pupil as either 'gifted' or 'hard-working' and the degree of congruence between a pupil's understanding of learning with the teacher's own. In the end, does 'gifted' mean well acclimatized, aptly perceptive and effectively responsive to the demands of a specific milieu?

Fascinated by the idea that learners' perceptions of learning influence the manner in which they apply themselves to learning and, as a consequence, appear effortlessly gifted or perseveringly hard-working instigated a cycle of reflection and re-visitation of all my core readings on Education. Questions like what learning is and how it is understood at all by a learner, even if learning is understood at all by a learner guided my dedicated immersion into the 'basics' of educational theory, and particularly on those perspectives seeking to describe the learner as an active meaning-maker and their process for understanding learning.

During my MA studies, I had the privilege of being introduced to metalearning by Chris Watkins, one of the pioneers in the field and a passionate advocate of making learners' voices heard, whose research resonated with the same questions I had come to ask as a result of research and reflection. Understanding learning as something that people are inherently motivated towards and which can be learned, posited the exact starting point of my thesis on the crucible of education: what is learning, and how is it learned?

I have chosen to open with this brief autobiographical account and to write in the first person because this thesis has required intensively active engagement and deep personal reflection. Open reflexivity demands recognition of my personal learning journey through academia having motivated, shaped, and guided my research from beginning to end, and is continuing to do so. Engaging in an endeavour in which research means understanding how other people construct understanding dispels any notions of objectivist detachment from my material. As an active researcher seeking to understand others' mechanisms of construction, my engagement with my material lies in faithfully representing the essence and intended meaning of it through scientifically accessible accounts.

My motivation to develop my academic understanding has coincided with that of listening to, making sense of, and lending my voice to making heard young pupils' perspectives on learning about learning. My research motivation led to my becoming part of a classroom and entrusted with pupils' accounts of metalearning, the richness, expressiveness, and reflective insight of which have motivated me to make research of this nature my life's work.

B. Metalearning as a field or a continued conversation

The field of metalearning presents an interesting case, since it has had pervasive influence in various domains of theory and research, yet has produced very thin descriptions of how people learn about learning, and no empirical research on metalearning in classrooms. Metalearning appears to develop through instantiated bricolage from developments on learning and understanding as furthered in different epistemic fields. As such, although a number of theorists have and still are demonstrating an active interest in the construct (Watkins, James, Claxton, Moreno, Deakin-Crick to name but a few), there is little sense of a community constituting and defending a field.

Coined as a term in the late 1970s (Maudsley, 1979) and riding the wave of popularity of the more widely recognized concept of metacognition, metalearning became the focus of interest of a number of influential works in the 1980s (e.g. Biggs, 1985; Novak, 1985). Interest waned during the 1990s and metalearning was appropriated or completely incorporated into notions of learning particular to specific disciplines. At that same time, the rise of Bandurian self-regulation constituted a more clearly defined and described field of enquiry, and dominated educational discourse. During the 2000s, metalearning saw a renewed surge of interest especially in the United Kingdom, with Educators aiming at a response to continuous pressures towards pupil testing and performance. Chris Watkins, Mary James and their respective teams suggested metalearning (also named learning about learning/ learning how to learn/ learning to learn) as a viable, implementable, performance-enhancing and lifelong-learning-conducive platform. This agenda of augmented emphasis on learning in schools and classrooms took various forms, predominantly that of school and classroom resources and designed interventions for raising awareness and bringing 'learning' back to school and classroom everyday discourse.

As a consequence of this shift in interest, the field, or rather the conversation, was steered towards the production of instructional designs, resources, materials, and platforms for teaching metalearning in schools and classrooms (the most well-known being Guy Claxton's Building Learning Power (Gornall, S., Chambers, M., & Claxton, G. (2005), with the principles behind it also available through a website under the same name), and created a strand of metalearning widely known as Learning to Learn. Although received with enthusiasm by British schools (Claxton 2006, confirmed by my IoE peer students who taught at schools at the time),

Learning to Learn quickly lost its appeal, due to its fragmentary approach to learning skills for learning.

The problem has since been pinpointed as Learning to Learn having a focus on objectives, rather than on its object (Claxton, 2006); although educational interventions were designed to incite and support metalearning, little to no attention was given to what metalearning is, and how it happens in schools and classrooms. Claxton, Watkins, Stringher, and others have since stressed the need for research-based advances to the strand of metalearning focusing on theoretical description, classroom manifestation, and personal construction. Until this thesis, no empirical research had been done on how people metalearn in classrooms. When considering that the European Union relatively recently set 'learning to learn' as one of its basic competencies present in all educational agendas and long-term planning (Lisbon 2020 agenda), the lack of empirical research on what that construct entails becomes all the more worrisome.

I present a more detailed history of metalearning in Chapter 2, but I deem it worthwhile to problematize metalearning as early as in the Introduction. The variety of notions associated with the construct, the development of two strands (Learning to Learn and metalearning), and the proliferation of cognitive psychological terms pertinent to self-regulation in educational discourse, have made metalearning appear contested and extremely difficult to access.

The express aim of this thesis is to provide a comprehensive account of the theory underpinning metalearning, clarify contested or under-theorized aspects of it, and provide an empirical, grounded overview of how pupils metalearn in classrooms.

C. Existent conceptual bases for continuing the conversation on metalearning

Although I recognize that my aim to reinvigorate interest in metalearning is ambitious, I make no claims towards reinventing the construct. Constructing an original framework for understanding and researching metalearning in classrooms is an undertaking firmly grounded on existent understandings, definitions, and suggestions. Since definitions could be viewed as the spine of conceptual development, I will present the core definitions that reflect the conceptual bases on which the concept emerged and has evolved, and which had, and still do constitute, metalearning as an object.

In his doctoral thesis published in 1979, D.B. Maudsley defined metalearning as 'the process by which learners become aware of and increasingly in control of habits of perception, inquiry, learning, and growth that they have internalized' (in Mezirow, 1981, p. 12). The core components of awareness, control, and learning have since then been inextricably linked to metalearning. Since metalearning was originally conceptualised as a super-theory, its development inevitably depended on advances in the fields of awareness, control, and learning.

One, if not the most significant contributor to metalearning, J. Biggs (1985) expanded Maudsley's definition by specifically presenting the current state of knowledge in regards to learning, control, and awareness. With Flavell's (1976) concept of metacognition inspiring a groundbreaking restructuration of the field of cognitive psychology, Biggs' (1987) modernized definition made clear the close relationship between the two 'meta' processes:

> The term metalearning is proposed here for the rather specialized application of metacognition to the area of student learning. Metalearning, then is, like metamemory or metamotivation, one of the subprocesses of metacognition; it refers to particular metacognitive processes involved in learning and studying in institutional settings, and more specifically those relating to students' awareness of their motives, and control over their strategy selection and deployment. (p. 84)

Additionally to localizing the field, Biggs also introduced three more core components: situativity (learning in institutional settings), motivations, and strategy. Belying his endorsement of the then increasingly popular interactionist approaches, Biggs suggests that metalearning implies an active, agentic, lifelong approach to learning even in the bounds of formal education.

From 1987, which marks the first translation of Vygotsky into English (Mahn and John-Steiner, 2013) and onwards, notions of learning, awareness, control, motivation, context, and strategy have become completely transformed through the advent and prevalence of Vygotskian, Brunerian, and post-structuralist theories. Learning as/through communication and symbolic interaction within the bounds of a community emphasised the role of metalearning as seminal for knowing oneself within one's world. The departure from theories causally and exclusively linking learning to teaching dissociated both learning and metalearning from formal education, although still highly likely to happen within it. In 2000, Carnell et al. expressed that shift in perception through their definition:

> If learning is the process of creating knowledge by making sense of your experience, metalearning is the process of making sense of your experience of learning. (p 5)

I support this as one of the most elegant and intriguing definitions given to metalearning, with its simplicity belying a myriad underpinnings, and each and every term requiring a definition in itself. I believe that this matrix for understanding metalearning through paradigmatical shifts, discontinuities, and clashes between fields, constructs and terms to be a platform for discussing and debating metalearning.

Before moving on to highlight the state of knowledge in regard to the underpinned constructs included or implied in the above definition, I deem it necessary to include a working definition (mine) that lists those constructs by deriving them from the previously presented definitions:

> Metalearning is the process of directing one's own learning by constructing, assembling, and/or activating learning dispositions or strategies as a response to current learning demands, or as a strategic plan for future learning. This includes an orchestration of cognition, affect, motivation, and elements of the social and physical context. Such a process evolves in a lifelong trajectory, with the ultimate goal of making sense of reality.

D. Metalearning as a process of personal sense-making of socially mediated processes linked to learning

It is my view that it is a consequence of the admitted paucity of empirical enquiries on metalearning that existent frameworks have paid little attention to clearly defining all constructs they include in metalearning. Theorising for the purpose of conducting an empirical enquiry (testing theory against social reality-ies) demands augmented clarity in definitions, since they have significant impact on design construction. In this particular thesis, the focus is placed on a situated understanding of a construct, therefore the need for comprehensively and cohesively defining all constructs and processes involved before moving on to empirical investigations is paramount.

All four core definitions discussed in the previous segment of this Introduction are rather reductive, and require analytic elaboration of each term included. Inherent in that process is also clarifying the relationships between the concepts defined. Chapters 2 and predominantly 3 of this thesis are dedicated towards that aim. However, in order to induct the reader to metalearning, I will at this point provide a brief description of metalearning as a process which involves mechanisms and subprocesses which people employ to learn about learning.

As its meta-prefix suggests, metalearning is a process of abstracting from learning, which remains the core concept. This implies that a 'meta' view of a concept is inextricably linked to existent, current, or trending views of the construct. Metalearning emerged through a particular view of learning, socio-constructivism/socio-culturalism, and therefore was framed through meta-components and meta-processes abstracted from learning.

Socio-constructivist/cultural notions of learning highlight the role of society and context in both the content and the communication dimensions of learning (as Illeris describes them in his 2007 book). People learn through socially designed curricula in socially designed contexts (schools, classrooms, and elsewhere), through socially designed interaction (pedagogy). The crucible of the two theories is that people learn through these media, but not exclusively because of them. Learning is located in a person's construction of the world which happens through their interaction with those contexts which constitute the world for the person. Socio-constructivism/culturalism advocate that the limits of one's world are the limits of one's experiences, and by implication place significant emphasis in enriching learners' range of experiences of interaction with different milieus. These Brunerian and Vygotskian views have in later years dominated conceptions of learning, and have slowly yet surely gained ground in formal educational policies and settings (Scott and Hargreaves, 2015, provide an excellent review of the fundamental principles and influence of these theories).

The emergence of situative perspectives was grounded on these two theories, and, mostly through Lave and Wenger's (1991) groundbreaking contribution, provided a new way of looking at learning in context. Situative perspectives adhere to learning as personal yet socially-mediated, and as an outcome of peoples' active engagement with their context. Carnell et al's (2000) definition encapsulates this understanding of learning as 'the process of creating knowledge by making sense of experience' (p. 5)

Metalearning is described as the process of being/becoming increasingly aware of the way in which one experiences learning, and having strategic control over it. The essence of that process is 'making sense of your experience of learning' (Carnell et al, 2000, p 5). Therefore metalearning requires a person experiencing learning (instead of, for example, just performing rote tasks), being aware of having experienced learning, and having control over applying themselves to learning as a response to current or future learning demands (metalearning strategy). This admittedly complex and multiphase process is orchestrated by the mechanism of regulation, which is charged with aligning personal cognition, affect and motivation, with contextual notions of cognition, affect and motivation.

Although an elegant construct/super-theory, metalearning in the literature presents some noteworthy conceptual gaps. To the end of constructing a comprehensive framework I focused my efforts towards considering available and congruent definitions for the ambivalent or under-theorised concepts I highlight in my review of the literature four ideas. The first of these is experience of learning: a common phrase and notion in current educational writings, experience, and especially that of learning, has not been directly or sufficiently defined or described in metalearning literature. Borrowing from Marton's phenomenography, I propose that the experiencing of learning is multi-faceted and involves cognition (knowing and understanding), affect (emotion), motivation (rationales and personal goals), and an understanding of the context (Marton and Booth, 1997).

The second is learning from and to experience. How do people learn how to experience learning? Metalearning literature has not provided or endorsed a specific view on the matter, but has defended that people can learn to learn. Watkins (2001) calls upon a model credited to R. Dubin (1962), which proposes that awareness of knowledge and knowing has four stages: from unconscious incompetence (don't know that you don't know), to conscious incompetence (know that you don't know), and to conscious competence (know that you know) or unconscious competence (don't know that you know). Although useful for linking two key components of metalearning, knowledge and awareness, it is beyond this framework to explain the mechanism guiding the process described. How does a learner become conscious of their competence or incompetence in order to regulate it?

An answer can be found in Marton's phenomenography and the idea that awareness is underpinned by perception of features of an experience and sense-making. Firstly, learners discern that a learning experience includes certain types of cognition/affect/motivation and

happens in specific situational demands. Then learners make sense of that experience, meaning that they produce and ascribe some understanding/interpretation to it.

Becoming aware, discerning aspects of an experience and making sense of an experience can also be located temporally. Marton (op cit) suggests that simultaneous awareness of aspects of an experience happens on two levels: diachronic, defined as 'the simultaneous experience of different instances at the same time' (Marton, Runesson and Tsui, 2004, p 17), meaning simultaneous consideration of experiences a person has discerned as similar, and synchronic, defined as 'the experience of different co-existing aspects of the same thing at the same time' (op cit, p 18). This is particularly significant for metalearning, as it provides a platform for understanding when metalearning is most likely to become visible to learners.

A third idea is sense, sense-making, and meaning. In common use in the education literature in general, and metalearning literature in particular, these concepts have not been clearly defined and distinguished. Although closely connected, sense and meaning serve different functions in Vygotskian literature, which makes the clearest distinction between them. In order to delimitate the interchangeability or looseness in the use of each term, I re-introduce Vygotsky's views in my own framework for metalearning: Sense is viewed as an aggregate of psychological facts that is grounded in a particular situation/experience; meaning, on the other hand, is understood as comparatively fixed and existent in culture and society, rather than situation. The importance of this distinction for metalearning lies in its impact: making sense of one's experience of learning gradually shapes the meaning they ascribe to learning.

Lastly, strategy has been an essential component of metalearning since Biggs' first description of the construct in 1987, and a rather popular term in education literature, with personal, learning, instructional, and problem-solving tangents. Of all fields using the term, cognitive psychology and self-regulation in particular provide a clear definition of learning-cognitive strategies. In the case of metalearning, despite the epistemological departure from cognitivism into socio-constructivism, no review of the term 'strategy' has been made, although it is associated with a wider, open-ended type of control designed by the learner. The strategy historian, L. Freedman (2013), argues in favour of distinguishing between strategy and plan, with the former including reappraisal and recalibration of the ends, ways, and means included, and the latter being linear and finite. This is rather important for understanding metalearning strategies as a personal construction and executive design that is constantly being shaped by the learner and which includes executive control of several plans for learning. Moreover, adopting such a perspective

of constant change and construction implies that that it is rather unlikely to trace a fixed, set starting point to metalearning, or an equally specific outcome to it, but that the strategic element is in maintaining an effective balance between desired ends, ways of achieving those, and available means.

E. Metalearning in classrooms

Metalearning also presents an interesting case in terms of the set of evidence supporting its theoretical development. Empirical research on applications of the process of metalearning is scarce and limited to adult education due to opportunity sampling, which has resulted in our understanding of younger learners' metalearning being the result of extrapolation. Nevertheless, conceptual advances have been supported by research on learning with younger participants. To this day, no empirical research exists with a focus on young children's metalearning, which can be attributed to two specific reasons. Firstly, the issue of younger learners' facility for complex and clear expression in self-report research has long been deemed problematic, and has discouraged researchers from engaging with samples of young children (Whitebread and Pino-Pasternak, 2013). This also belies the dominant cognitivist view that metalearning is a higher-order cognitive skill that is not inherent or spontaneously activated, but one that should rather be taught. The second reason behind the lack of empirical research with Primary school samples can also be attributed to the latent and residual influence of cognitivism on sample selection. Despite the fact that socio-cultural and socio-constructivist understandings of learning (under whose mantle metalearning was incepted) stress the influence of context on peoples' learning and press for situative designs, most designed research and interventions had an aim of generalisability. This realisation came very early on in my own review of the literature, and acted as a confirmation of Claxton, Watkins' and Stringher's assertions that it has become necessary for the field to revisit if and how young learners metalearn before designing any intervention for support.

The aim of this thesis is to research if and how metalearning happens in a Primary classroom. What I discuss in my literature review and methodology chapters is that a project on situated metalearning requires equal measures of attention to conceptualising and researching the situation. I recognise that establishing congruence, continuity and coherence between a research problem and a research design is not an endeavour that is entirely technical, but rather

interpretivist and creative. I therefore make no claims to establishing a conceptual or methodological orthodoxy through this project.

Researching metalearning in classrooms requires a creative synthesis of understandings and methodologies for accessing both metalearning and classrooms. The theoretical understanding of the classroom as a community or milieu with a specific and unique understanding of learning led me to choose researching situated metalearning through a single, constructivist case study. The most crucial decision that influenced my research design was to solely rely on learners' own accounts collected through qualitative interviewing, instead of teacher, or even researcher accounts based on observation or any other measure. This choice of immersion in others' experience and sense-making was crucial for researching metalearning in particular, but also as an overall standpoint in researcher-participant relationship of respect, which I generally adhere to.

This sequence of choices led to a research framework based on a general research problem which reflects the state of theory and empirical evidence in the field:

> Metalearning is, to a great extent, situative. What kind of metalearning happens in a specific learning environment?

In line with Watkins' (2001) and Kloosterman's (2014) suggestions for qualitative access to metalearning, I selected three research questions that would guide my locating metalearning in pupils' accounts in the rationale and the connections each participant or cluster of participants makes when linking all components of metalearning important to them. These questions were used as vectors of access to understanding and analysing my two main datasets-units of analysis: pupils' diachronic and synchronic reflective accounts.

- What accounts do pupils construct of their metalearning as it happens in the context of their classroom?
- Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do?
- Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning?

F. Extending theory and thesis limitations

The design of this project is abductive throughout: in its theoretical construction, methodological design, and empirical investigation. As such, it privileges participants' views on their experience, which it reconstructs into scientific descriptions. Establishing an original theoretical framework and heuristically seeking points of convergence or confirmation through empirical enquiry ultimately serves the aim of extending theory, by either providing richer descriptions of an empirically validated construct, or adding complementary concepts to the framework constructed.

This particular thesis has an overall aim of extending and enriching existent theory, by corroborating existent theorisations with pupil experience and views, corroborating my own contributions to theorisation with pupil experience and views, and seeking emergent aspects of pupils' experience and views that could inform future theorisations.

The choice to research metalearning in (primary school) classrooms imposes certain limitations on this thesis. Firstly and most importantly, researching situated metalearning means limiting my research interest to sense-making of learning that pupils have done in and through the classroom. This means sense-making achieved in extra-curricular activities, like private tutoring or special interest clubs, is beyond the scope of this research. Also excluded are wider social and family understandings of learning, and so are school-wide understandings of learning. Although the latter are expected to influence those of the case classroom, they cannot be expected to describe what that particular community of people has made sense of learning as.

G. Structure of the thesis

Chapter 2 is a critical review of literature on metalearning and its component subprocesses. Structured as a history in the Foucaultian sense of the word, my presentation of the literature comprising the field of metalearning includes a discussion on the conceptual underpinnings and their evolution over time, but also the politics and interests that led to the development of two strands of metalearning, learning to learn (teaching metalearning) and learning about learning or metalearning (personal process). Lastly, I discuss the main theoretical and methodological

connections the field of metalearning has with fields whose research objects are similar to it, and whose developments could inform it.

Chapter 3 is a discussion on the theoretical components I construct a synthesis of in order to produce an original framework for metalearning. Issues of experience, awareness, learning and strategy are combined into a platform for understanding and researching metalearning.

Chapter 4 describes my methodology for this study, including a detailed presentation of my theoretical approach to designing an empirical enquiry, details on the empirical setting and sample, a discussion of the methods and tools used, and a framework for analysis.

Chapters 5 and 6 include a thematic presentation of my fieldwork data. In Chapter 5, I present pupils' diachronic metalearning, located in accounts produced through pupils reflecting on accumulated metalearning that they base on multiple past experiences of learning. In Chapter 6, I present pupils' synchronic metalearning, located in accounts produced through pupils reflecting on specific experiences of classroom learning.

Chapter 7 is a discussion of my finding from the two previous chapters. Links are established with previously existing theory, and with my own theoretical framework. Consideration is given to describing metalearning strategies through categorical or dimensional typologies.

Chapter 8 consists of my concluding remarks on this project as an effort to advance knowledge in the field of metalearning, as well as reflections on the achievements, limitations and implications of this study for learners' and teachers' approaches to classroom learning. Particular recommendations are made for raising the awareness of schools and teachers on the issue, and for supporting metalearning through encouraging learners to openly reflect on learning.

Chapter 2: HISTORY OF METALEARNING

A. History of an idea

In this chapter, I aim to provide a history of the construct of metalearning. Choosing to regard metalearning as a construct denotes my intent to unravel a discussion of metalearning not as a real object that has forever existed beyond context, but as a product of a fragmented and often non-linear conceptual line of thought. I will therefore attempt to present my history of metalearning as a Foucaultian account: providing a history of those concepts belonging in the sciences concerned with the examination and development of ideas means that the rationality for piecing together the history of a discipline is through the displacements and transformations of concepts.

Beneath the level of history concerned with continuities of thoughts, genres and epistemic legacies lies the level of 'epistemological acts' and 'thresholds' (Foucault, 1969, p. 5) which derail and reroute the rationalities moving disciplines forward back to their beginnings. What Kuhn described as revolutions, Foucault posits as the point of restarting writing the theory of a discipline. This act of recurrent redistributions means that 'historical descriptions are necessarily ordered by the current state of knowledge' (p. 5). Displacements and transformations lead to a re-articulation of a discipline while cleansing it of unfruitful dead-ends or superfluous extrapolations. It is not, however, only a process of deconstruction; writing a history is also a process of systematic and meticulous construction. Foucault uses and recommends the analyses found in the oeuvres of G. Canguilhem (a,b) and M. Guéroult (c) as a model (references not provided by Foucault, who discusses the essence of their overall oeuvre), since they provide three main areas of focus:

> a. ...[these analyses] show that the history of a concept is not wholly and entirely that of its progressive refinement, its continuously increasing rationality, its abstraction gradient, but that of its various fields of constitution and validity, that of its successive rules of use, that of many theoretical contexts in which it developed and matured.
> b. ...A distinction between the microscopic and the macroscopic scales of the history of the sciences, in which events and their consequences are not arranged in the same way, ergo discoveries or failures have a different significance for each level.

> c. There are architectonic unities of systems ... concerned not with the description of cultural influences, traditions and continuities [author's note: that is the domain of recurrent redistributions] but with internal coherences, axioms, deductive connexions compatibilities. (Foucault, 1969, p. 5)

Lastly, Foucault directs attention to those texts, books, or oeuvres, the specific influence of which has forwarded theoretical transformation (discontinuities, breaks).

My history of the construct of metalearning will therefore be a discussion of the recurrent redistributions and of the architectonic unities of systems which bound metalearning. A chronological history of the construct of metalearning will be presented, necessarily ordered in the current state of knowledge. This history will provide an account for the conceptual development of the construct of metalearning, by addressing the developments, discontinuities, achievements and failures in the microscopic level. This implies attention to both progressive refinement in the theoretical fields in which metalearning developed and matured, and to radical breaks in others. Complementarily, I will also address the status metalearning occupied after each discontinuity or new network of determination on the macroscopic scale of the history of the learning sciences. Since metalearning is a relatively new and underexplored discipline, claims as to the macroscopic can only be limited. However, historical linearity denoted through the temporally placed production of influential texts and oeuvres in the field can contribute to considerations of the macroscopic through critical judgements on the influence of the text to the politics establishing metalearning as a domain of the learning sciences.

The following presentation of the history of metalearning interweaves the chronological and conceptual development of the construct achieved in different fields. This history also includes a consideration of developed conceptualisations and their definitions for metalearning, and critically reviews the theoretical and research approaches that have emerged though each such conceptualisation. In my opinion, the significance and value of such a history lies in showcasing metalearning as a distinct epistemic object that is worthwhile of further conceptualisation and research.

Lastly, some mention ought to be made of how Foucault's social view of knowledge, knowledge-development and of his epistemological concerns are reflected in my actual account of metalearning. My re-examination of the state of knowledge in the field of metalearning implies

an intention to re-present existent theory that has been developed through social practices (scientific dialogue and research within the field); furthermore, to develop knowledge by bridging discontinuities by entering the social field and connecting with those social actors who directly experience metalearning (see Methodology Chapter). This move to the empirical domain (which is the essence of my research on metalearning) for the purpose of accessing relevant social practices also reflects Foucault's epistemological concerns over the politics that regulate the construction of histories: constructing a history and designing research specifically for the discontinuities highlighted in the former makes clear the epistemological stance of the historian-researcher, and as such helps make transparent the politics which guide them. As such, this thesis constitutes an effort to not only showcase those politics in the field that predate my involvement, but to also highlight how this work can contribute to the field.

B. History of the idea of metalearning

B.1 Theoretical and epistemological progression from metacognition to metalearning

The term 'metalearning' emerged soon after Flavell's (1976) seminal chapter on metacognition. Although discussion on higher order cognitive processes was ongoing for the better part of the decade that followed that publication in several epistemic fields, the differentiated concept and term metalearning did not emerge as such until Donald B. Maudsley's (1979) doctoral thesis on learning in organisations. Maudsley built on Flavell's higher-order thinking principles and defined metalearning as 'the process by which learners become aware of and increasingly in control of habits of perception, inquiry, learning, and growth that they have internalized' (in Mezirow, 1981, p 12). Maudsley (1979) proposed five principles that facilitate metalearning in organisations. Learners must: ‘a. Have a theory [of learning], however primitive; b. Work in a safe supportive social and physical environment; c. Discover their rules and assumptions; d. Reconnect with reality-information from the environment, and e. Reorganize themselves by changing their rules/assumptions’.

Metalearning with a focus on learning rather than organisational structures did not emerge in the research literature until J. Biggs (1985) used it to describe the state of 'being aware of and

taking control over one's learning' (p 186). Biggs' interest in metalearning stemmed from his taking a side regarding the debate on the prevalence of 'personality and situational factors in determining observed approaches to learning' (1987, p 11), which was popular at the time. Biggs identified with theory and research which argued that 'learners react in a way typical for them across situations, as well as in a way dictated by a particular situation' (p 12). This position tends to highlight interactions between the learner (person) and the learning environment (context). In his 1987 monograph, Biggs provides the following definition of metalearning:

> The term metalearning is proposed here for the rather specialized application of metacognition to the area of student learning [also vis Novak and Gowin, 1984]. Metalearning, then is, like metamemory or metamotivation, one of the subprocesses of metacognition; it refers to particular metacognitive processes involved in learning and studying in institutional settings, and more specifically those relating to students' awareness of their motives, and control over their strategy selection and deployment'. (Biggs, 1987, p. 84)

This conception of metalearning includes the implicit ideas that learners a. need to have knowledge and understanding of how they learn, b. are motivated to regulate themselves in this way, and c. have the capacity to regulate their actions and behaviours in this way. (Jackson, 2004 p. 391)

Soon after Biggs' first theoretical framing of metalearning, significant contributions were made by two expansive fields: science learning, and computational learning. These two disciplines promoted very different theorisations: science learning followed Biggs' principles and provided a particular subject context in which to apply them, whereas computational learning applied those principles to machine learning. J.D. Novak, Professor of Education and Biology, produced several publications (Novak, Gowin and Johansen, 1983; Novak, 1985 and Novak and Gowin, 1984) with a focus on using metalearning in the classroom to reduce misconceptions, which in science learning are considered the biggest and most resistant obstacle to constructing concepts. Misconceptions are ontological, epistemological, and/or analytic fallacies derived from empirical observation (e.g. all edible fruit grows on trees, so all trees produce edible fruit). The concept of metalearning in computational models of the mind still features quite prominently and prolifically in research. Metalearning in that particular field has become associated with predicting outcomes and inductive reasoning biases (e.g. Schmidhuber, Zhao and Wiering, 1996) by conceptualizing actions of learning as 'learning algorithms'.

The prevalence of subject-independent, interdisciplinary, general educational theory and research, allowed for metalearning to be viewed as an object of the learning sciences, and predominantly follow the theoretical and epistemological shifts in that field. In education, the departure from cognitivism (Cognitivism in psychology and philosophy is roughly the position that intelligent behaviour can only be explained by appeal to internal cognitive processes, that is, rational thought in a very broad sense) and a shift towards critical theories which posited context as central to learning also shifted interest from metacognition to metalearning. This theorisation of meta-processes gradually led to the reframing of Biggs' (1985) definition by proposing that metalearning is not a subprocess of metacognition, but is rather superordinate (vis Hager, 2000). The permeating influence of the social and physical environment on learning inverted the previously established taxonomy. For educators, metalearning 'covers a much wider range of issues than metacognition'' (Watkins, 2001, p 1; Moreno, 2005). Whereas metacognition is used when emphasizing awareness of cognitive processes and executive control over them, metalearning tends to be used as a wide term, with a focus on making sense of one's experiences of learning, through the cognitive, motivational and affective aspects that that process includes.

Interest in developing the construct of metalearning did not, however, emerge just as a counterproposal to cognitivist metacognition that would help establish constructivist educational studies, but rather conformed to pre-existing theories involving awareness and executive control over learning. The idea of control over one's own learning predates metacognition, and had somewhat earlier been delineated by theories of self-directed learning (vis works by Tough, Knowles and Hiemstra during the 1970s; Guglielmino and Paul, 1977). Self-directed learning had a wider, more learner-oriented rather than cognition-focused perspective on control over one's own learning, evident in its definition of the self-directed learner as:

> ...one who exhibits initiative, independence and persistence in learning; one who accepts responsibility for his or her own learning and views problems as challenges, not obstacles; one who is capable of self-discipline and has a high degree of curiosity; one who has a strong desire to learn, or change and is self confident; one who is able to use basic study skills , organise his or her time, set an appropriate pace for learning, and develop a plan for completing work; one who enjoys learning and has a tendency to be goal-oriented. (Guglielmino and Paul, 1977 p 73)

As such, the endorsement and development of metalearning in educational studies rather than cognitive psychology was based on already existent, congruent views of the learner as in control not only of their cognitive faculties, but of other components and processes of learning as well. Several theories have emerged which consider this principle of control and self-direction as seminal, and have ultimately fed back into educational understanding of the learner; along with metalearning, examples include Dweck's learning orientations, research on learning to learn, lifelong learning, learning preferences.

Nonetheless, the development of the construct of metalearning did not end with its endorsement by educational studies, but followed the same shifts and developments the construct of learning did in that same field. Metalearning was initially conceptualised during the rise of popularity of Vygotskian, sociocultural views of learning in the English-speaking educational tradition (from the late 1970 and onwards). A rise in questioning the rigidness of instruction and individual learning led to several new approaches being incorporated into socioculturalism and, a little later on, Brunerian socioconstructivism. Approaches like G. H. Mead's Symbolic Interactionism, or Latour's Actor-Network theory and all their extant strands (e.g. Lave and Wenger's concept of Community) greatly enriched learning and metalearning, by stressing the importance of milieu and interaction. The latest theoretical influence on learning, and subsequently metalearning which motivates further research seems to be the element of situativity, which is the temporal and social boundedness of learning and metalearning, which becomes product and property of specific groups or communities, and is transferable, but not identically replicable.

Even within the field of education, however, it is interesting to remark that metalearning has followed the epistemological and theoretical trends that prevail in the English-speaking world particularly, and does not yet have a strong presence in any other educational tradition (the notion of meta-apprentissage does not exist in French educational literature, for example). In tandem with the concept of metalearning itself and most of the research on it being developed in American or Australian educational contexts, a surge of interest in the concept has arisen in the UK since 2001 (research and theory by James, Claxton, Watkins). Since then, international perspectives on metalearning have developed to fit cultural and institutional views of learning and education on various countries (Deakin Crick, 2014).

B.1.A The development of two strands of metalearning

At this point it is important to stress that, in the course of all the previously described shifts and changes metalearning underwent, two major understandings and approaches emerged. Illeris (2007) suggests that metalearning is used to denote either 'what more popularly has been termed 'learning to learn', i.e. an idea that today learning is so important that one must also learn how to tackle it', or 'accustoming oneself to thinking critically and analytically about one's own learning in a personally and societally general perspective' (p 67).

The implication of Illeris' distinction between these two understandings is the highlighting of different underpinnings each represents. While learning to learn is based on the premise that learning is a process that can, or should be taught, a personal capacity for metalearning is more closely tied to the constructivist idea that all people have an innate ability to learn.

Early in the development of the construct of metalearning most approaches were more strongly oriented towards the first approach, and as such were rather didactic, and learning-skills oriented, as Claxton (2006) asserts. He notes, however, that more recent conceptualisations of metalearning have a stronger focus on people's personal metalearning and its didactic management (what Claxton calls 'fourth-generation' metalearning).

The predominance of metalearning understood as an outcome of direct instruction (mostly training to learn and to acquire skills relevant to learning) is evident in the bulk of literature on metalearning/learning to learn/learning how to learn. Although most works endorsing this understanding of metalearning do pay some attention to personal metalearning, they mostly view that as a desired outcome that should ideally follow the instructional intervention each author and researcher proposes. More recently, Claxton (2006), who is one such theorist involved in the design of interventions for metalearning, has for some time strongly advocated a shift away from such training-based approaches, towards their integration to classroom learning in support of learners' personal metalearning.

The majority of publications on metalearning (learning to learn/learning how to learn/learning about learning) do not explicitly adopt one understanding of metalearning over the other. Moreover, the interchangeable use of terms like metalearning, learning to learn, etc to denote either one understanding or the other, or, quite often both, is still highly problematic for the field, strands of which develop independently of each other in terms of terminology, conceptual

development, and methodology. Lastly, the definition proposed by each research team, theorist, or corpus of theory includes different components, processes, and more or less direct affiliation to one of the two understandings of metalearning. Given that metalearning as an autonomous specialism within the field of education is relatively new and has very little grounding in the empirical sphere, an ongoing dialogue on definitions is understandable. Nonetheless, higher specificity regarding definitions would significantly help further this dialogue by establishing a common basis of conceptual reference.

My own choice, in terms of naming the construct is that of metalearning or learning about learning, which I will hereby use in my text. This choice is to denote my affiliation with Biggs' original terminology and distinct understanding, and to stress my focus on the process of metalearning rather than teaching for metalearning.

So far, the development of theory on metalearning (either strand) has been furthered through a number of initiatives and theorisations, with most being UK-based. The first initiative to date on Learning how to Learn was led by Mary James from 2001 to 2005, and was part of the ESRC Teaching and Learning Research Programme. This research-led initiative raised awareness in both academia and schools, and produced two very influential books: Learning How to Learn: tools for schools (2006) and Improving Learning How to Learn: Classrooms, Schools and Networks, (2007). James and her team were the first project team to showcase the value of metalearning (or Learning how to Learn) through the recommendation of particular approaches to teaching.

Also in 2001, a review of 100 research articles on metalearning (not always named as such) was published by the Institute of Education and the National School Improvement Network (NSIN). This review was led by Chris Watkins, an independent researcher with a passionate interest in the field, and aimed at establishing learning about learning as a field by regrouping and reinterpreting pre-existing empirical evidence. Watkins' et al's review was the first conceptualisation to highlight metalearning as a personal capacity.

Since then, metalearning as 'learning to learn' (teaching for metalearning) has been strongly linked to lifelong learning, as a subprocess of it. The development of the Effective Lifelong Learning Inventory (Deakin Crick, Broadfoot, and Claxton, 2004) by the University of Bristol emphasizes the value of learning to learn for building learning power, through defining and measuring a person's orientation towards effective lifelong learning.

The Campaign for Learning (Higgins et al., 2007) posited that learning is essentially learnable, and that it involves a set of skills and principles that can offer a learner awareness of their preferences and learning strengths, how they can motivate themselves and be confident, the importance of good living conditions and a positive environment for learning, specific strategies like memory enhancement, or of helpful habits they should develop, such as reflection on learning for future improvement.

This emphasis on the relationship between metalearning and lifelong learning led to its recommendation as a key competency of lifelong learning included in the Lisbon and 2020 strategies (Education Council, 2006), and the creation of the European Network of Learning to Learn (Hoskins and Fredriksson, 2008). As an outcome, research was since furthered at a level of policy and international comparison and collaboration by the World Bank, Unesco, and the European Union through collaborative publications (Deakin Crick, Stringher and Ren, 2014).

In that same 2014 publication, editors Deakin Crick, Stringher and Ren stress the need for the widening of current narrow conceptual frameworks with no evidence of success (OECD), and for 'a research validated foundation for learning to learn and what constitutes it'. They, like Watkins (2015), highlight the crucible of theory and research on metalearning: absence of any empirical research on what constitutes metalearning as a personal ability, especially as one that is or can be actualised in classrooms.

However, literature on 'what constitutes' metalearning does exist, but not under 'learning to learn' (which could lead to viewing Deakin Crick, Stringher and Ren's assertion as quite political, and as an indirect demonstration of an intention to colonize the field with their preferred terminology). Work on learning about learning or metalearning as showcased and reviewed by Watkins (cited above as one of the first in the UK) provides deeper insights into the components and processes of metalearning as a naturally occurring process that can and should be further assisted. It is to that sum of works that I will predominantly base my discussion on components and processes of metalearning, although a number of insights are also derived from those works on learning to learn that also consider and theorise metalearning as personalised.

B.2 Components, sub-processes, and the process of metalearning

The emergence and consideration of higher-order or meta-processes is prevalent in contemporary educational research, regardless of their epistemological consideration as phenomena or epiphenomena (a secondary phenomenon accompanying another and caused by it). This plethora of meta- components which flourished after educational interest in taxonomies of thinking (Moseley, 2005) was expressed through interest in metacognition and metalearning, but also through a number of more specific approaches to thinking and learning that range from metacognition (1,2,3) to metalearning (4,5,6) according to Watkins (2001): Thinking about Thinking; Learning to Think; Learning to Study; Learning How to Learn; Learning to Learn; and Learning about Learning. (p. 1).

Educational research on metacognition (1,2,3) focuses on measuring learners' awareness of their metacognitive processes, which is researched mostly quantitatively (JoLs- Judgements of Learning/ JoKs- Judgements of Knowing) and how that awareness affects their dedication to focusing on tasks and allocating time to studying (vis all works published in the Journal of Metacognition and Learning, Springer). The fundamental processes of planning, monitoring and reviewing that individuals activate in order to control and direct their cognition remain the basic focus of all studies on metacognition.

Thus far, empirical research on metalearning has mostly focused on the socially mediated processes of teaching and learning metacognitive strategies in specific social and physical environments (Learning to Learn), with learning how to learn and learning about learning being mostly theory-driven conceptualisations. All three approaches take account of the interest areas Biggs (1985) originally associated with the concept: deep/surface strategies and performance; patterns of processing ability (simultaneous/successive); locus of control (internal/external); motivation (congruence/incongruence with strategy), and situation-specific approaches to learning/teaching.

Subsequent theoretical advances in fields touching upon each of these areas (theories of personality, motivation, effective learning and communication) have fed back into Biggs' original understanding, and have established more specific links as to how these areas become interconnected in regard to learning. This basic understanding, (presented in Carnell et al, 2000) is shared by all conceptualisations of metalearning:

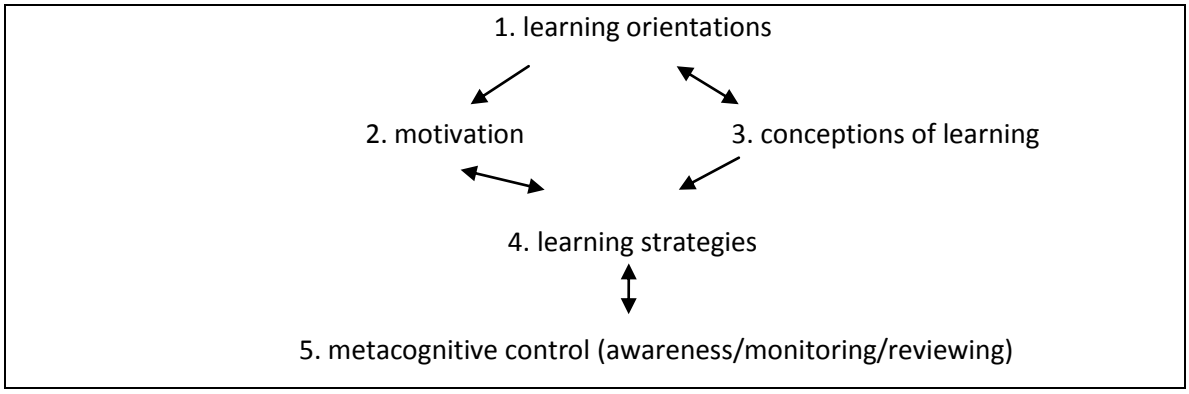


Figure 1. Components and flow of the process of metalearning

Watkins (2001) suggests that a person's learning orientation, meaning their approach towards achievement-related tasks, constitutes in itself a basic process that underpins metalearning. Learning orientations (Dweck, 2000) describe the tendency of learners to approach learning tasks either for improving their competence (learning orientation), or proving their competence (performance orientation). This Achievement Goal Theory construct aims at describing two opposing learner profiles of success in relation to motivation to learn and response to challenging tasks: learning-oriented individuals typically keen to engage in challenging tasks in pursuit of growth, and performance-oriented individuals who tend to shirk challenges in order to avoid failure. Research (vis Watkins, 2001 for a review) has indicated that a learner's orientation (used interchangeably with attitudes towards learning, or learning dispositions) is strongly indicative of the learning strategies they employ. Learning oriented individuals tend to have richer 'conceptions of learning' (op cit, p 2), meaning a wider range of learning strategies and augmented awareness of them. The link between awareness and control suggested in metacognition literature also applies in this conceptualisation, and serves to link the basic premise of metalearning that enhancing a learner's awareness of their learning can allow them to take control of it.

This basic conceptualisation of metalearning as a personal capacity is based on a secondary consideration of the context in which learning happens, mostly derived through learning orientations and their dependence on the quality of the context as a motivational structure. My understanding is that this rather de-contextualised approach is a heritage of metacognition and its preoccupation with 'objects', and not with 'subjects-in-context'. This further supports my overall argument that metalearning has not yet been wholly updated to concord with the paradigmatic shift from cognitivism to socioconstructivism/culturalism.

More recent understandings of learning have led to the expansion of metalearning to include more aspects of learning in context, and to consider what metalearning in context means. Situative, or learning-in-context perspectives (Lave and Wenger, 1991; Järvelä and Volet, 2001; Volet and Vauras, 2013) have, additionally to highlighting the influence of the context of learning (be that a classroom, a school or an educational system), stressed the importance of experience. Metalearning theory in general, and Carnell et al (2000) in particular endorsed this perspective, and constructed the simple, yet elegant definition for metalearning already cited above: 'If learning is the process of creating knowledge by making sense of your experience, metalearning is the process of making sense of your experience of learning.' (Carnell et al., 2000, p.5)

Metalearning is here conceptualised as a process of making sense of one's experience, denoting a personal construction and understanding of events As such, all experiences are situated, meaning temporally and locally bound to specific social and physical environments in which a person learns. This introduces the idea that metalearning is a process of utilising the elements of awareness and control derived from metacognition, and instead of focusing them only on cognition, using them on all elements that constitute an experience.

Metalearning literature endorses the pre-existing constructionist view that people experience contexts, situations, and phenomena through cognition (knowledge and knowing), affect (feelings), and conation (motivations for engaging), all of which are relevant to the context (social and physical environment) in which the experience occurs. This view of experience is also evident in Stringher's 2014 review of metalearning (learning to learn) literature, in which she suggests that a holistic overview of metalearning includes four dimensions: cognitive, metacognitive, affective-motivational, and social. Although these aspects of an experience are usually researched by the field of cognitive psychology, literature on metalearning aligns with the field of education instead, due to its implicit understanding that cognition, affect and motivation are socially mediated (Volet et al, 2001, Volet et al, 2013). This constitutes it as different from the field of self-regulation, which still upholds a more cognitive psychological view on experience and its components. Since existent metalearning theory has not elaborated further on the issue of the experience of learning, I will pursue a more detailed description of experience and interpretation of Carnell et al.'s (2000) definition in Chapter 3.

As far as the locus of experience is concerned, literature on metalearning has demonstrated a consistent focus on institutional education, and particularly communities, like schools and classrooms (especially in Learning to Learn interventions). Interactionist and post-structuralist understandings of learning in such communities suggest learning to be located in the interaction between person and context (Scott & Hargreaves, 2015). One possible and frequent reading of the literature is that metalearning is actualised by the two direct contributors to learning: the teacher and the learner engaged in dialogue. That is not to imply that both contributors stand on an equilibrium of power, and therefore co-construct learning, or metalearning. Nevertheless, a dialogic, reciprocal relationship between the two alternates the flow of power. Teachers stimulate and learners respond, and then learners demand and teachers supply. As such, teachers are likely to stimulate metalearning in learners, who then initiate or continue to use processes of personal construction of metalearning.

In the literature, this dialogic relationship can be summarised as involving: a. Teachers teaching for development of awareness and control of processes activated during learning (knowing, thinking, feeling, producing); b. The learner's effort towards effectively developing his/her learning including responding to the teacher's stimulation. Learning about learning is, however, constrained by specific aims. One can easily think of teacher-learner interaction framed as it is above as IRE (initiation-response-evaluation) cycles or CDR (conventional-direct-recitation, (Gage, 2009)) methods. However, there are specific aims in the core of metalearning, which suggest a different approach. The aims of metalearning are that learners focus on learning as opposed to performance, promote a rich conception of learning and a rich range of strategies, and lastly, that they develop strategies to monitor and review (Watkins, 2001, p. 2)

A move towards a collaborative ethos in Education in keeping with Vygotskian and Brunerian pedagogies (Puntambekar and Hubscher, 2005) have promoted peer dialogue and peer support in classrooms. However, the claim of co-construction as involving identical processes and outcomes for all pupils is untenable, with different pupils being in command of different aspects of metalearning with different levels of success. Notwithstanding, it is still necessary that the teacher supports pupils in their exchange and development of metalearning by providing a learning environment conducive towards metalearning (its components and subprocesses), and that they guide pupils' communication and exchange of metalearning strategies towards success.

To summarize my view of metalearning presented thus far: metalearning can be conceptualised as partly cognitive (monitoring, planning, reviewing), partly affective (emotions linked to learning experiences and expectations) and partly motivational (engagement with learning). Since all components of an experience of learning (cognition, affect, motivation) are viewed as socially mediated (Volet et al, 2001, Volet et al, 2013), intense emphasis is placed on the social context and the process of mediation. The movement which originally motivated Biggs to define metalearning, interactionism, gained a strong following after the West became familiar with Vygotskian and post-Vygotskian sociocultural/constructivist theory. Mead's (1936) symbolic interactionism, already popular in pedagogic discourse, and the later prevalence of post-structuralist perspectives which view learners as actors operating within (social) networks (Latour, 2005) have also strongly influenced metalearning. In more recent years, it has become a normalised framework of reference for the field of metalearning to view the learner no longer as an entity of fixed traits, but as a product and producer of their social reality (metalearning) which they actualise through interaction.

It is, however, insufficient to describe metalearning as a sum of components and aspects of experience, which could imply that any individual who is aware, or in command of those is metalearning. Metalearning is essentially the process that connects all these components, and has a double aim: allowing the learner to make sense of their experience of learning, and to help them strategise for future learning by taking command of their own learning.

In metalearning literature, the mechanism charged with activating, controlling, making judgements and pulling together components/resources is regulation (the learner regulates his/her learning through activating, controlling, making judgments and pulling together resources). Regulation is also charged with enabling the learner to decide on effective ways (strategies) for navigating future personal learning, and then to actualise them in opportune moments/experiences/contexts. This essentially constructivist understanding of regulation can be viewed as encompassing the orchestration of all previously described components of metalearning:

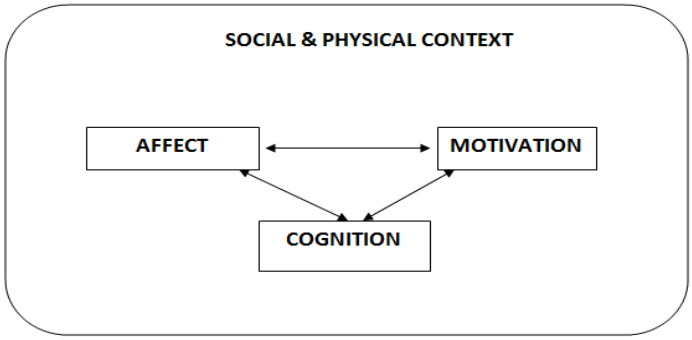


Figure 2. The components of metalearning linked by regulation.

At this point, and before moving on to a more detailed discussion on regulation and situated metalearning, I believe it is useful to present a summary reading of the discussed components and processes involved in metalearning, which covers all theorisations of the construct developed thus far:

> Metalearning is the process of directing one's own learning by constructing, assembling, and/or activating learning dispositions or strategies as a response to current learning demands, or as a strategic plan for future learning. This includes an orchestration of cognition, affect, motivation, and elements of the social and physical context. Such a process evolves in a lifelong trajectory, with the ultimate goal of making sense of reality.

B.2.a Regulation

The concept of regulation, which originated in biology, was later appropriated by educational psychology in order to label learners' capability to 'mobilize, direct, and sustain one's instructional efforts' (Zimmerman, 1995, p 217). Albert Bandura's social cognitivist theory of self-efficacy (1986) as well as Ryan and Deci's self-determination theory (2000) call that capability self-regulation. The most prominent theorist on self-regulated learning, B.J. Zimmerman, makes a clear distinction between metacognition and self-regulation, since the latter involves 'a sense of personal agency to regulate other sources of personal influence (e.g. emotional processes and behavioral and social - environmental sources of influence)' (Zimmerman, 1995, p 218). However categorical Zimmerman is in his distancing from

metacognition, Dinsmore et al's (2008) review of research in the field of regulation has indicated that there is significant overlap, and indeed confusion, in the use of terms and methodologies in theoretical and empirical research, as many other researchers have also indicated (e.g. Chan, 2012; Kaplan, 2008). A possible resolution is underlined by McCormick et al. (2013), who highlight that recent developments show a 'growing consensus that metacognition is most easily understood as an essential component of self-regulated learning' (p 71).

Research on metalearning has been but minimally involved in the debate on regulation between self-regulation and metacognition. Although it borrows conceptual elements from these two fields, its distinct interest in formalised learning in schools has allowed for flexibility of definitions, depending on the classroom learning it is used to describe. There is, however, a closer affinity to the broader concept of regulation as provided by Self-determination theory. Regulation in metalearning is therefore the learner's internal mechanism for 'systematically adapt[ing] strategies to changes in personal and situational conditions' (Bandura, 1986). The differentiating element here is that regulation is inextricably and causally linked to reciprocal interactions within that learner's social environment (i.e. teachers, peers), and does not exist independently of those. Although successful constant self- and interpersonal regulation can ideally lead to automaticity, it always maintains its interactionist angle, since 'learners react in a way typical for them across situations, as well as in a way dictated by a particular situation'. (Biggs, 1987 p 12).

In a synthesis of theorisations, regulation can be therefore described as a complex mechanism for smoothing experience-generated discrepancies in both internal aspects of learning (self-regulatory) as well as the external interface between the self and the context in which pupils learn. Regulation also constantly bridges and harmonises the internal and the external sub-mechanisms of regulation, allowing the learner to efficiently adjust and apply themselves to learning in a specific context, or across contexts.

Effective learners are highly competent at regulating the three aspects of metalearning (cognitive, affective, conative), and past research has indeed asserted that ‘people with metacognitive awareness are more likely to recognise the applicability of a strategy in a different-looking context’ (Watkins, 2001, p 7). Metacognitively-aware learners are therefore more likely to effectively recall successful past learning strategies and motivational patterns. A learner's ability to transfer and make use of these patterns beyond the context of their

inception is what promotes them from being competent in metacognition to being competent in metalearning. Metacognition leads to successful self-regulation which translates into learners having a confident belief in their metacognitive awareness. Being self-regulated, the learner can then look to the social and physical environment for instructions or cues about the task at hand, and regulate themselves through those. Ultimately, the learner aims at success at navigating across contexts and situations by activating an array of metalearning strategies.

B.3 Situating metalearning in the classroom

It is an assumption of the socio-cultural paradigm that all individuals are motivated to understand themselves and others, and therefore construct conceptions about their own learning. Learning about learning in the social and physical environment of a classroom can be viewed as a blueprint for understanding and navigating all subsequent learning contexts in a learner's life (Deakin-Crick , 2014). That means that the mechanisms of regulation are iteratively reinforced in a particular way. This direct relationship poses questions for the quality of metalearning promoted by each classroom and school, 'because sometimes [the context] promotes [metalearning], and other times because it does not (e.g. when rich conceptions of learning are not encouraged in schools)' (Watkins, 2001, p 2).

This notion of social contexts directing regulation in particular ways, alludes to the notion of knowledge as shared meaning-making, and learning as the act of sharing. Provided that the social context of a school actively promotes metalearning (metaknowledge, metamotivation etc) metalearning itself can also be construed as shared meaning making, but of a higher order than knowledge (Volet et al, 2009 ; 2013). Knowledge is constructed through a learner's interaction with their social and physical environment (peers, teachers, but also material resources). Brown, Collins and Duguid (1989) assert: 'understanding is a shared phenomenon, [...] learning can be usefully viewed as joining a knowledge community, and [...] much learning remains very specific to the social situation in which it was originally learned' (in Watkins, 2001 p1). These situative assumptions are also theorised as relevant to metalearning: metalearning strategies are experienced in a particular way afforded by a particular social and physical context (Volet et al, 2013, Vauras et al, 2013).

Recent emphasis on situative factors has, however, created new debates on the extent of the influence of social and socially-produced context on metalearning. It is useful to clearly state

my position here; however helpful it might be for a learner to see helpful things in their learning environment, sharing negotiated meanings with peers or adults is altogether different. The former alludes mostly to perceiving and interpreting, whereas the latter to active engagement and participation. Although one presupposes the other, both are necessary types of knowing and thinking when considering sociocultural/constructivist learning.

B.3.a Classroom metalearning

Thus far, although situated notions of metalearning have gained prominence in metalearning literature (in both teaching for metalearning and personal metalearning strands), lack of empirical research on metalearning in classrooms imposes strong limitations on detailed understanding of how and if learners metalearn in a classroom. Nevertheless, theory on metalearning has addressed some aspects of metalearning in a classroom.

Schools and classrooms which support learning by upholding learning how to learn have certain characteristics which either reinforce or decrease learners' dispositions towards aspects of their metalearning process (as seen on Figure 1). According to Watkins' 2001 review, past research in schools has established that: a. A focus on learning can enhance performance, whereas a focus on performance can depress performance (performance here means success in academic assessment); therefore, interventions towards 'learning orientations' should be promoted in schools. Attitudes aimed at improving a learning orientation also enhance metalearning, which is reflected in both learning and performance; b. Promoting learners as active and collaborative constructors of meaning with autonomy and self direction can enhance performance. This implies how learning how to learn can be achieved, and it precludes views of teaching as direct transmission (James, 2007 p 28). A focus on metalearning requires a teacher in the role of 'facilitator', who provides strategic support in autonomy-rich classroom structures (Puntambekar and Hubscher, 2010 p 2).

More specifically, Watkins (2001) recommends that building learning about learning in a school requires a process view of learning, recognition of the need for explicit talk about learning, every day practices in [and of] the classroom (frequent opportunities- metalearning routines), supportive school vision and management, and resilience to keep at bay the pressures and simplifications (p. 7).

As discussed previously, each school and classroom might wholly or partially subscribe to these principles. Since, however, schools and classrooms are in themselves set up by individuals with a specific view of learning and a sum of learning and metalearning experiences, it is to be expected that metalearning in two classrooms can never be supported in exactly the same way. Learning how to learn, as delineated by the above principles, cannot become standardised. Although this is not an argument against the emergence of regularities when researching or teaching for metalearning, I strongly support the view that successful metalearning is so completely situative that it, or, more accurately, a version of it, can only be viewed as a property of specific people, in a specific learning space, in a specific time and place.

Allowing, therefore, for adherence to general principles of metalearning, an effective metalearner should be able to recontextualize skills and strategies across situations while working autonomously to improve his or her own learning. For a learner, applied metalearning could be a synthesis of a. being/becoming aware of one's own knowledge about learning (knowing what you know and don't know about your own learning, and relating what you are learning to what you already know about learning, realising when you understand how you learn, or not), and b. regulating internal components of metalearning (cognition, affect, motivation) in order to make sense of them. This synthesis of a and b is also supported by a process of regulating with the social context in which learning happens, by using contextual cues (teacher or peer feedback on their learning and metalearning, as well as stimuli from the physical environment of the classroom e.g. using data from displays to compensate for lack of knowledge).

A harmonious orchestration of deciding what to learn about one's own learning and how to learn it would translate into the following sequence for action:

> (a) having/acquiring requisite skills
> (b) choosing to use the skills
> (c) recognising when a particular skill is appropriate in new situations, and
> (d) metacognitive awareness, monitoring and checking progress. (Watkins, 2001, p. 7)

Watkins has schematised this sequence into a cycle in order to showcase the iterative course of metalearning, and the way in which sub-processes of regulation of aspects of experience and components of metalearning are incorporated into that process:

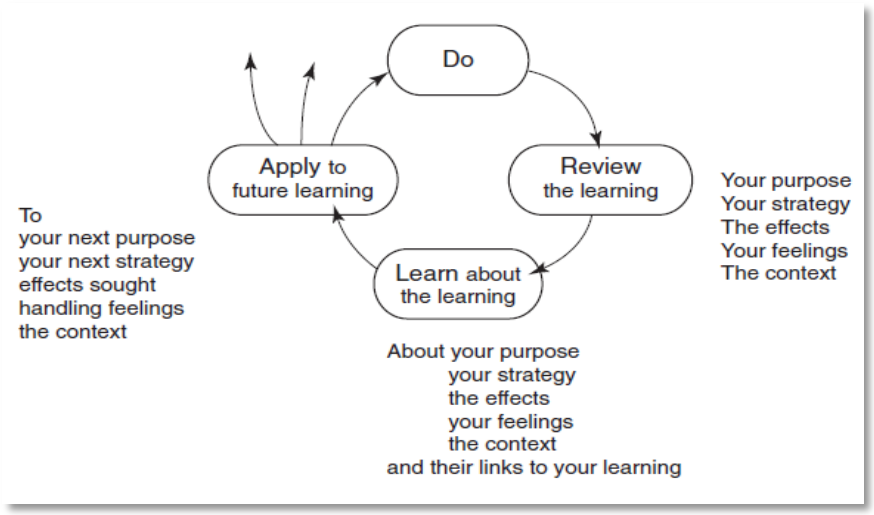


Figure 3. The process of metalearning (mine, based on Carnell et al, 2000, p. 33)

In a few words, each step of the above process could be read as: i) Do (learn): The process of metalearning starts with learning. Doing learning is the first step towards making sense of the experience of learning; ii) Review the learning: Reflection on the experience of learning facilitates locating those aspects of the experience which have affected the learner the most; iii) Learn about learning: The crux of the process of meta-learning. At this stage, the learner uses the products of his/her reflection to create knowledge. Making sense of the experience of learning is added to a knowledge/strategy inventory with the aim of informing and directing future learning; and iv) Apply to future learning: The learner can now activate specific learning dispositions and strategies to influence future learning.

These principles for conceptualising and applying metalearning are not arbitrary. There is a wealth of theory and empirical research on taxonomies of principles of thinking, thinking about applying and ultimately moving into executive action (vis Moseley, 2005 for a review). Jackson (2004), concluding his comprehensive discussion on the concept of metalearning asks a critical question: Does metalearning add anything useful to metacognition? His own answer to that question is that metalearning is more about the personal experience of learning, rather than general principles on how thought and cognition is formed and managed. Metalearning builds on the premise that patterns of development of understanding follow general principles. What metalearning adds to metacognition and self-regulation is the emphasis on experience and personal meaning making.

C. Researching metalearning

Conceptualizing metalearning is the first step towards establishing it as a valid domain in educational research. The consummate step towards that goal is, however, linking the construct to the empirical world through research. Based on a theory that draws from several epistemic fields, and is thus broad and accommodating in definitions, research done on metalearning has mostly been grounded on research on its constituent epistemic research traditions, or on its components, regardless of discipline (Watkins 2001, 2009, 2010; Claxton 2006, Deakin Crick, Stringher and Ren, 2014; Stringher, 2014). Metalearning has therefore been accessed (even conceptually developed) through research on higher-order thinking strategies, metacognition including situative elements, and strands of cognitive psychology concerning multiple factors of learning in situation. It has therefore not been carried out into metalearning specifically. Once more, I find it important to repeat Stringher (2014) and Watkins' (2015) ascertainment of complete lack of empirical studies on metalearning specifically, especially in classrooms.

With each field conceptualizing or interpreting metalearning within the bounds of diverse research philosophies and methods, research is vastly varied. Metalearning seen as method, product, or factor of learning or productivity has been pursued by different disciplines. The one research perspective closest to education is that of metalearning as a form of thinking, due to its qualitative nature, explanatory aim, and balanced theoretical and empirical approach to research. Most other research, which is mostly psychological and cognitivist, is concerned with describing metalearning or shaping it into a factor within much more complex theoretical schemes of learning (one prominent example being the field of Lifelong Learning).

Although the relationship between metalearning and similar constructs and fields has been presented to a degree in this history of the construct, I deem it necessary to provide a wider overview of each discipline that is conceptually similar to metalearning. These disciplines either have already contributed to the conceptual development of metalearning, or have ample potential to influence further conceptual development through parallel advances. In this section, focus is placed on the epistemological and methodological underpinnings of these disciplines or constructs, since these have led to, or produced the advances guiding the history of metalearning, or they have a potential of doing so in the future.

C. 1 Metalearning and learning strategies

Metalearning values the internal voice that directs self-development, and volitional, personality-dependent rationales that learners activate and build into their process of understanding learning. In order to highlight the importance of personal voice and self-direction, a strand of educational research contributed to by Biggs (1985) (who first grounded metalearning on learning rather than organisation), is concerned with presenting general patterns of how pupils make meaning. Aimed at constructing taxonomies of thinking and learning, this strand of research is mostly theoretical and builds on models of the mind and paradigms of learning and thinking (Hattie and Yates, 2014; Biggs and Collis, 1982). It is related to metalearning through considering higher order thinking to support and contribute to awareness of learning and thinking and to competence towards planning for further learning. Recontextualisation, also called transfer of learning in such models and taxonomies, is often hailed as the culmination of learning efforts, since it constitutes the actualization of learning through the medium of strategy.

The relationship between metalearning and thinking taxonomies is evident in that Biggs had already conceptualised a taxonomy of thinking and understanding (Biggs and Collis, 1982) before developing that into the unified construct of metalearning. In that taxonomy, which is strongly based on developmental (Piagetian) and outcome-based conceptions of competence of understanding, Biggs and Collis (op cit) propose that relational and extended abstract levels of understanding allow the individual to integrate new understandings into a structure, and reflect in order to generalize (these new understandings) into new domains. The way in which metalearning was then developed by Biggs on the basis of this taxonomy is clearly reflected here.

All such taxonomies of thinking and understanding are eloquently summarised in D. Ausubel's claim that 'if I had to reduce all of educational psychology to just one principle, I would say this; 'The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly' (Hattie and Yates, p 114). This premise is a point of convergence for cognitivist and constructivist perspectives, conciliating computational models of the mind and social models of the mind. Building on previous models can be achieved by strategic learning. Misconceptions in prior knowledge lead to interference, which means revising previous structures in the basis of new learning. Building on new learning is led by

meaningfulness and relatedness (Hattie and Yates, 2014), connecting new patterns to prior knowledge. Therefore, the constituent parts of learning strategies (techniques) can be seen as directly related to accommodating new, correct/more stable knowledge.

Metalearning strategies could be viewed as organisers, strategies supporting and directing the acquisition, retention and handling of knowledge about learning. From simplest to more complex, learners direct learning by using techniques, learning strategies and metalearning strategies, and use them from simplest to more complex (learning how to learn leads to knowing how to learn) as well as the other way around (metalearning directs acquisition and accommodation of new knowledge about learning).

I have not up to now come across empirical research on learner rationales for constructing or adopting particular clusters of metalearning strategies. Research on metalearning has mostly focused on making interventions to promote awareness of the concept or to devise instruments to help incorporate it into teaching routines. Our understanding of learners' developing their understanding is still in progress.

Top-down approaches translating theory on learning into tools for researching higher-order learning (metalearning) have contributed to empirical educational research by constructing research methods for identifying, measuring and, to a lesser extent understanding metalearning in learning situations. Such approaches consider competency in recontextualization as an indication of higher-order learning, and propose interventions to direct the facilitation and support of metalearning. The most iconic approach to supporting strategy building and directing, which is still applied, is that of Novak and Gowin (1983, 1984), who introduced concept mapping and the heuristic vee.

In 'Learning about Learning', one of the earliest works on metalearning, Novak and Gowin (1984) stated their interest in learning and knowing. Both of these are processes of constructing concepts and sets of concepts, labels and label regularities, and most importantly, 'methods for organizing events or objects in ways that enable them [students] to see new regularities and in turn to recognize the labels that represent those regularities' (p 5) (an event is anything that happens or can be made to happen, an object anything that exists and can be observed, and concept is a perceived regularity in events or objects). Learning strategies are therefore logical, abstract tools for understanding and acquiring knowledge and/or skills (epistemological). Their application to learning can be viewed as a process of symbolic interactionism: thinking patterns

and symbols (i.e. schemata) within the individual become externalised in the form of language and symbols (action). Social negotiation of these concepts, labels, and regularities occurs, and its products may become re- internalised by the negotiating individuals or groups.

This conceptualization of strategy led Novak and Gowin to propose two tools for supporting strategy construction (they call this 'meaningful learning') by learners, through the provision of schematization. Concept mapping, nowadays a commonly used practice in educational settings, is the construction of a network of relevant concepts and propositions, aiming to facilitate schematisation through establishing relationships between them. Metalearning is here located in the rationale behind recognising patterns in the links connecting concepts. The second tool Novak and Gowin introduced is Gowin's Heuristic Vee, aiming to schematize the structure of knowledge (Gowin, 1970). This vee delineates learning as within the framework of epistemology, linking previous knowledge to strategizing for further learning, and producing at its point the 'focus for knowledge creation' (Novak and Gowin, 1984 p 627), ergo what needs to be learned.

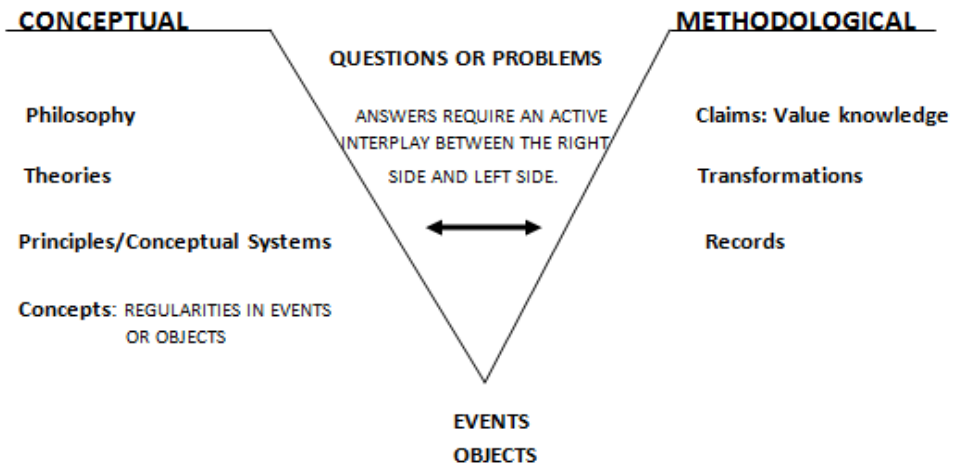


Figure 4. Gowin's Heuristic Vee (Novak and Gowin, 1984 p. 628)

In her systematic review, Stringher (2014) presents some other models of what she calls 'learning to learn' (here viewed as a strand of metalearning): the Alberta Project (Collett, 1990), Gibbon's Cube (Gibbons, 1990), the Learning to Learn framework of the University of Helsinki (Hautamäki et al, 2002), and the ELLI project (Deakin-Crick et al, 2004) (for an extensive presentation vis Stringher, C., 2014). All these models share a common conception of learning

to learn which includes regulation of cognition, affect and motivation and emphasis on situated learning and the importance of the social environment. These models list characteristics of 'learning to learn' with the ultimate aim of a. evaluating, producing, or furthering interventions and of developing policy (Helsinki), b. lifelong personal development (ELLI) or c. strategic strengthening of individuals. With the exception of ELLI, which produced an instrument of self-assessment metalearner profiles, all other models have remained theoretical, and thus can only be used as top-down methodological approaches testing theory against the empirical domain (e.g. case study).

Approaches to researching metalearning strategies are greatly influenced by the scope and the sample used. A vivid example is research focusing on metalearning as a lifelong property of learners, researched through adult participants (Kloosterman, 2014; Collett, 1990, etc). Although the basic components of metalearning remain the same as with young learners, strategies can be expected to be much more solidified and comprehensive, awareness of the self much augmented and the language of description much more elaborate.

The learning interview (Kloosterman, 2014) is a method in which participants interview each other with the help of an interview protocol. Using the protocol as a guide, the learning interview can be seen as a conversational interview in which issues of 'planning learning', 'seeing yourself as a learner', 'learning moments', 'learning with others', 'ways of learning' and 'the impact of learning' are reflected upon. Metalearning strategies are expected to emerge in the rationale and the connections each participant or cluster of participants makes when linking all components of metalearning important to them. This method is in stark contrast to ticking-box inventories, identifying as well as promoting awareness and communication amongst learners, a recent trend in researching metalearning qualitatively.

Two more recent innovative approaches to researching and supporting metalearning suggest a sustained interest in gaining understanding of metalearning, particularly in younger ages. Wall (2008) has developed a series of templates for facilitating Primary school pupils to express their metalearning (more specifically their thinking about learning) through depiction and discussion. In a very imaginative approach, Nixon (2013) has suggested the use of metaphors by teachers in order to make more transparent the ways in which pupils understand their learning and direct themselves to learn.

C.2 Metalearning and metacognition

Metalearning, being still firmly based on metacognition, uses the same starting point: metacognitive knowledge. Wenden (1998), describes this knowledge as 'the facts that learners acquire about their own cognitive processes as they are applied and used to gain knowledge and acquire skills in learning situations' (p. 34). Metalearning also adds to this baseline of knowledge the affect patterns that accompany control and meaning-making, as well as cues derived from interacting with social and physical surroundings. The basic metacognitive strategies are:

a. Connecting new information to existing (personal) knowledge.
b. Selecting thinking strategies intentionally.
c. Planning, monitoring and evaluating thinking processes. (Dirkes, 1985)

These general processes, despite having emerged from the cognitivist tradition, can be modified into metalearning strategies. This modification requires taking account of those meta-processes concerning affect and social and physical environment as well as metacognitive aspects. These processes also adhere to the metacognition-derived scheme of planning, monitoring and evaluating (Schraw, 1998). Regulating cognition, affect and contextual cues, is consequently connected to constructing complex and detailed strategies for awareness and control of all the aspects mentioned. Actively using cognition, affect and context in a strategic manner to ensure a goal is met can be achieved through:

- Planning—deciding what to do and how to do it (pre-planning) and modifying plans while you are doing it (planning in action).
- Directed attention—deciding in advance to work on the general aspects of a task (as opposed to focusing on random aspects, like partitioning, without thinking of it as part of an overall strategic plan)
- Selective attention—deciding in advance to concentrate on certain things.
- Self-monitoring—checking one's performance when engaging in a task.
- Self-evaluation—appraising one's own performance in relation to self or external criteria or standards.
- Self-reinforcement—rewarding oneself for success. (Jackson, 2004, p. 394)

However, metacognition has often been criticised for being a highly prescriptive field, and one replete with conceptual proliferation. Multiple level models make unclear associations between

cognitive and metacognitive measures, and produce major conceptual overlaps with self-regulation theory (Zimmerman, in Jackson, 2004). This lack of conceptual and methodological clarity suggests a need to frame metalearning in a particular empirical domain and thus away from full endorsement of contesting umbrella theories. For example, my choice to focus on metalearning as developed by primary-aged pupils has required adopting specific and clearly presented epistemological positions on knowing, learning and acting, directly relevant to my choice of empirical domain.

C.3 Metalearning and developments in cognitive psychology

In recent years, processes of affect and interaction with the social and physical environment of learning have been integrated in structured models. Such a comprehensive model is the latest one structured by Efklides (2011) in the field of cognitive psychology, the metacognitive and affective model of self-regulated learning (MASRL). This model treats metacognition and metacognitive knowledge as traits manifested by self-regulated learning individuals in a 'Task x Person' level of interaction. Individual learners exhibit traits such as 'cognitive ability, metacognitive knowledge and skills, self-concept, perceptions of control, attitudes, emotions, and motivation in the form of expectancy-value beliefs and achievement goal orientations' (p. 1). The premise is that individuals self-regulate when faced with tasks. This leads to framing situated learning as a combination of 'metacognitive experiences, such as feeling of difficulty, and online affective states (synchronous learning) play a major role in task motivation and bottom-up self-regulation' (p. 1).

Metalearning is still lacking such a comprehensive model to explain meta-cognition, affect, self-direction and interaction with social and physical environments of learning. Efforts for establishing such a one rather than resorting to bricolage are fairly recent, and in a constant process of review due to the unclear boundaries between processes characteristic of learning and metalearning.

An emerging field seeking to further the understanding of metalearning processes is that of Interpersonal Regulation of Learning and Motivation. Theoretical and methodological advances of the more socio-constructivist and situative epistemologies have started participating in a dialogue focussed on updating previously exclusive cognitive models and research findings into socially sensitive paradigms which are predominant in education. Dialogue in this field has been

furthered and made public through two collective books; one on on theoretical advances (Volet and Järvelä, 2001) and one on methodological advances (Volet and Vauras, 2013). This dialogue, although led by advances in motivation, has introduced several explanatory frameworks (description to follow) that could and have been used to theorize aspects of learning and metalearning in education. Still, conceptual consistency is lacking, with the term 'metacognitive regulation' dominating frameworks, despite having all the characteristics of metalearning (+affect +motivation).

A significant proposed term approximating metalearning is that of Socially Shared Metacognitive Regulation (SSMR) (Hadwin et al, 2011; Rogat and Linnenbrink-Garcia, 2011, Volet et al, 2013). 'Socially shared' denotes all 'instances of non-individual, joint regulation of content-processing or task completion' (Volet et al, 2013 p. 70) and 'metacognitive regulation' is used to avoid power relationship implications between agents. Experimental studies using SSMR (Vauras et al, 2003; Iiskala et al, 2004; Iiskala et al, 2011) aimed at identifying the function and focus of SSMR in collaborative problem-solving situations between pupils. The latest study by Iskala et al (2011) produced the following model for coding categories of focus and function.

Function	Description	Examples
Facilitate	The direction of the activity continues the same as previously and strengthens during the episode	
Activate	Activating a new construct in line with previous direction	Drawing the understanding of the problem on paper to inspect and to progress towards the goal
Confirm	Confirming that the previous direction is correct	Deciding to check the correctness of what is previously done
Inhibit	The direction of the previous activity is interrupted during the episode	
Slow	Slowing down a continuation of the previous direction	Questioning reasoning, e.g. what's been done previously and hesitantly continuing
Change	Changing the direction of previous activity	Rejecting on-going activity and taking another course of action
Stop	Stopping the direction of previous activity but a new direction does not appear	Reaching a dead-end and not deciding how to continue
Focus		
Situation model	Attempt to regulate a situation model, cognitive representation of the events, actions, persons, or an analysis of the problem or different circumstances of the problem	Discussion on a real or fictitious word situation outside the problem, drawing the givens of the problem, combining different conditions to represent the whole problem
Operation	Attempt to regulate merely strategies or a local matter (e.g. of that moment) without considering the whole problem	Discussion merely on the mathematical operations without considering the situation model, e.g. decision to check calculations
Incidental matter	Attempt to regulate incidental/detail issues	Discussion on details, e.g. should whole numbers of decimals be used

Table 1. Coding categories of function and focus of socially shared metacognitive regulation (Volet et al, 2013, p. 75)

The principles of metalearning are clearly apparent in this model. Self-direction in making decisions about individual cognition and affect are clearly bound by the context with the aim of producing results. Having focused on control groups of high achieving pupils and turn-taking in the process of problem-solving, the study by Iskala et al (2011) has moved on from the planning-monitoring-evaluating scheme of metacognition to address the type of interaction through which that process is communicated between learners. It does, however, represent a limited aspect of the social and physical context of metalearning.

The second major kind of studies conducted on socially mediated metacognitive regulation (which I understand as metalearning) focuses on externalised, behavioural indicators of self-direction. David Whitebread, a pioneer in researching learning through video, has developed a more comprehensive framework of categories and codes for recognizing and classifying incidences of metacognitive regulation. These non-verbal indicators complement and/or make plain 'internal mental plans' (Whitebread and Pino-Pasternak 2013, p 21) of self-direction (which Whitebread calls self-regulation): carrying out internal plans, working towards solving a problem, perseverance in the face of difficulty and sustaining attention on task (p 21). Internal self-direction can be externalised thus:

Code	Sub-code	Example
Planning	Making a decision on task	Child compares two objects before deciding which to use
	Seeking and collecting necessary resources	Gathering and setting out markers, paper, and stencil before commencing task
Monitoring	Noticing an error	Child stops mid-way through an action (placing puzzle piece), pauses and re-directs action to place it somewhere else
	Checking own performance through gaze, pause or gesture	Child stops in middle of a sentence, pauses, nods her head as a sign of confirmation, and continues with her speech
	Checking and/or correcting the performance of another child	Child observes closely the actions of another child while instructing him on planting bulbs, and uses gesture to demonstrate how to do it
Control/ Regulation	Using non-verbal gesture as a strategy to support own cognitive activity	Enumerating listed points of a verbalised list using fingers
	Applying a previously learnt strategy to a new situation	Child stretches string out taut so as to cut it, having previously tried to cut it when it was hanging loose and then successfully cutting string held taut wound round a pillar
	Repeating a non-verbal strategy in order to check the accuracy of the outcome	Child repeats dice counting task using finger pointing after realising that she is not sure whether she has counted correctly
	Seeking help	Child looks to teacher for confirmation that a verbalised guess in a counting exercise is correct
	Copying from, or imitating a model	Child looks at a physical model (example: word on whiteboard, previously constructed craft) repeatedly while completing a task
	Changing from one strategy to another on task	Abandoning second pair of scissors to stabilize paper while cutting
	Helping or guiding another child using gesture	Child points at computer screen or interactive whiteboard to indicate where another child should click the mouse
Reflection/evaluation	Careful observation of progress of task performance or component of task	Child rotates scissors in hands while opening and closing them before initiating cutting activity
	Explaining task	Child uses gestures to demonstrate to adult/child how task was accomplished or how activity was conducted
	Testing the outcome or effectiveness of a strategy in achieving a goal	While filling a dump truck with blocks using a number of strategies, child carefully wheels the truck back and forth to be sure that the blocks will not fall out/the truck will not tip over.

Table 2. Non-verbal indicators of metacognitive regulation (D. Whitebread and S. Pino-Pasternak, 2013)

Both Iskala et al's (2011) and Whitebread and Pino-Pasternak's (2013) explanatory frameworks can and have been used to identify episodes of decision making regarding a learner's personal control of learning or the subsequent interaction with their physical and social environment.

Now, whether these processes are labelled mental modelling and procedural action (Hattie and Yates, 2014), or metacognitive regulation (Iskala et al, 2011; Whitebread and Pino-Pasternak, 2013), or Socially Shared Metacognitive Regulation (Vauras et al, 2013) or metalearning (Watkins, 2001; James et al, 2007; Jackson, 2004) the focus remains the same. There is a common interest in how learners orchestrate and activate internal or external resources in order to direct themselves toward producing artefacts or further learning. Psychology has approached this from the perspective of the learner and the processes they employ, and education has made more advances in the area of contextual influences framing and encouraging metalearning.

D. Continuing the conversation on metalearning

My reading of the history of metalearning from its inception as a construct, to its theoretical development and research approaches, and finally to its association and cross-fertilization with other fields of inquiry, highlights one major underdeveloped area both in terms of theory and of research: learners' metalearning as a personal capacity for awareness and control over their own learning. Although this was the original concept associated with the term, understanding of how/if learners metalearn, especially in classrooms and systematic education is still lacking.

As seen in the review of the literature on metalearning, theoretical understandings do exist, albeit fragmented and interspersed in theorisations of different strands of metalearning, or constructs that overlap with metalearning in terms of object and/or epistemology. Existent theoretical elements include a social-constructivist epistemology, which includes augmented emphasis on situativity. Learners are understood as motivated to construct an understanding of their learning, especially through experiences and interaction with their social context. In formal education, experiences of learning mostly occur in classrooms. Therefore metalearning can be situated in the sense-making of learning experiences pupils have in classrooms. A second element is making sense of an experience and using that sense to envisage and direct oneself towards further learning is a process wider than metacognition. Interacting with one's context and experiencing it happens through cognition, affect, motivation, and an understanding of that context. Therefore metalearning involves awareness, and control over multiple processes. A third element is awareness and control over cognition, affect, motivation and understanding of the context is achieved through the mechanism of regulation. Regulation allows a learner to make sense of their experience of learning as unified but multifaceted, since it is charged with

maintaining a balance between all internal sources of influence (cognition, affect, motivation) and external sources of influence (context ideas about and demands on individual cognition, affect, and motivation). The aim of metalearning is to allow learners to use their sense-making to not only understand how they learn in a classroom, but also to envisage how to best apply themselves to learn in the future. Metalearning for directing oneself towards effective learning in the future is actualised through metalearning strategies (personalised, unique plans of action for making sense of their learning and use that to improve future learning).

This conceptualisation of metalearning can serve as the theoretical basis for further theoretical development and empirical investigation. At this very early stage in empirical research on metalearning, my own research focus lies on researching to what extent these theoretically derived principles of metalearning are part of learners' everyday experience of learning in the classroom. In other words, understanding classroom metalearning firstly requires establishing whether classroom pupils do experience metalearning: What are the learning experiences they make sense of? What sense do they make of them? Do they use their sense-making to construct strategies for better future learning?

These questions challenge the fundamental principles existent theory has included in the construct of metalearning. My perspective on continuing the conversation on metalearning is that it can be achieved through a process of constructing or selecting appropriate definitions for the components and process comprising metalearning. Such augmented specificity can allow both for fellow theorists to ascertain the aspects in which their own conceptualisation is congruent to others, and for researchers to construct designs for researching specific understandings of metalearning. The chapter that follows constitutes my own effort towards defining the components and processes of metalearning and thus towards constructing an original framework for metalearning.

Chapter 3: EXPERIENCING LEARNING, MAKING SENSE OF THAT EXPERIENCE, AND CONSTRUCTING METALEARNING STRATEGIES.

This Chapter builds on the previous Chapter and the discussion on the theoretical tangents of metalearning as a personal capability which have been developed either as metalearning or in other fields, but with significant relatedness in regard to their theoretical and research object. My endeavour towards a continuation of the history of metalearning includes the construction of a theoretical framework for metalearning that is more cohesive, with each construct comprising it being specifically defined, each relationship between constructs being theoretically described, and epistemological/paradigmatical (socio-constructivist/situative) congruence established between all components of the framework. A careful definition of each construct and relationship entails a description of its epistemological paradigmatical underpinnings within existent-dominant metalearning theory. This can in turn facilitate discerning between those constructs which have already been updated epistemologically to reflect most recent socioconstructivist/situativist views, and those that still rather adhere to more positivist-cognitivist perspectives; the latter can then be theoretically re-described and updated to match the former in paradigm through consideration of advances in relevant theory and research. Achieving such a cohesive framework for understanding metalearning requires turning to the foundational process of defining those constructs included in existent definitions of metalearning, but which lack conceptual clarity. The concepts of experience, awareness, making sense, and strategy, exist in metalearning literature and in the following fundamental definitions of metalearning, yet either lack definition entirely, or existent definitions are lacking in exactitude, and/or consistency.

Briefly, metalearning in Chapter Two is defined through Carnell et al.'s (2000) basic definition 'making sense of the experience of learning', and through the theoretically wider aggregated definition:

> Metalearning is the process of directing one's own learning by constructing, assembling, and/or activating learning dispositions or strategies as a response to current learning demands, or as a strategic plan for future learning. This includes an

> orchestration of cognition, affect, motivation, and elements of the social and physical context. Such a process evolves in a lifelong trajectory, with the ultimate goal of making sense of reality.

Both definitions rely heavily on the concept of experience, and particularly of situated experience, which puts emphasis on how individuals construct experiences in specific contexts. In the following discussion, I choose to present the latter through theories of learning and awareness specifically, because they are also strongly grounded in the field of educational studies and also because most have strong constructivist underpinnings, and are therefore also epistemologically congruent with the construct of metalearning. Additionally to experience and awareness, some discussion on the theoretical scope of metalearning on sense-making is required, since most writings on it omit defining sense making or subsume it in their epistemological discussions due to its being an assumption in all strands of constructionist theory. Last but not least, the issue of strategy is also in need of a specific definition because of the multiplicity of definitions of it in education and in other fields, and also for adding emphasis to the 'constructing future learning' aspect of metalearning.

A. Experience

In the OED, experience is defined as 'the state of having been occupied in any department of study or practice, in affairs generally, or in the intercourse of life; the extent to which, or the length of time during which, one has been so occupied; the aptitudes, skill, judgement, etc. thereby acquired' (definition No.8 in 'experience, n.' OED Online. Oxford University Press, September 2015. Web. 10 October 2015). This rather wide definition of experience as the knowledge or mastery of an event or subject gained through involvement in or exposure to it, requires further specification as to its constituents.

Ference Marton's work on learners' perspectives on learning, and especially his 1997 book with S. Booth, provides interesting insights on the role of experience in learning and being a learner in a context. Marton and Booth (op cit) suggest that the possible ways of experiencing the world are knowing it, sensing it, and being in it. This conceptualisation of experience suggests that relating to the World happens through cognition, affect, and an understanding of one's context. Indeed, Marton's work on phenomenography, or the study of people's understanding of their

context-bounded experience, is strongly based on these three constituents of experience. Situative perspectives also stress the tenet of understanding one's context, but also posit motivation as a basic constituent of experience (vis collective works by Volet, Boekaerts, et al).

The same group of constituents of experience are also used for framing it in other theories relating experience to learning and metalearning. Illeris' (2007) holistic view of learning includes a person having situated interaction with a social context in order to acquire knowledge from it by relating to it through cognition, affect and conation (motivation). As far as metalearning is concerned, the same group of components of experience have been set as the foundation of the concept since its inception by Biggs (1985, vis Chapter 2) and have informed all conceptualisations of metalearning ever since.

Nevertheless, Biggs' original conceptualisation and all subsequent theory have not been based on empirical research of metalearning in classrooms, but rather of metalearning as a phenomenon linked to learning, which implies a context-independent, universal perspective. My own interest in researching metalearning in a specific classroom does adopt the fundamental understanding of personal metalearning to include cognitive, affective, and motivational components, but seeks to further establish the range and manner of influence of the context on personal metalearning.

B. Theories of learning and awareness

My review of the literature has led me to believe that metalearning theorists and researchers (e.g. Watkins, 2001, 2009; Alberici and Di Rienzo, 2014; Claxton, 2006) pay particular attention to the experience of learning, which inspires and sustains learning to learn/metalearning. A prominent theorist and researcher of experience of learning and learning through experience in the field of education, Marton, suggests in his works (Marton and Booth, 1997; Marton and Tsui, 2004) that experiencing a context involves perceiving being in that context and discerning each of its constituent features and its role in the function of the context. In other words, experiencing presupposes being aware of the context in particular ways. This premise has been associated with learning for quite a long while, and has been approached through an extended number of theories and models. I will briefly present those theories and models that I view as more pertinent to (meta)learning in classrooms, as they are closely affiliated to education, and uphold constructivist/sociocultural/situativist perspectives that match my overall framework.

B.1 Phenomenography

It would be remiss to not expand on the perspective that 'Learning and Awareness' (Marton and Booth, 1997) provides on the link between experience and context awareness, since my own conceptual framework and interpretation of empirical data on metalearning in classrooms is so firmly based on this perspective.

The authors argue that experience is generated by awareness of a context, and that experiences are particular to contexts. A conceptual pillar of their discussion on how people derive understanding from their experiences of learning is the argument of Pramling, Klerfelt, and Williams Graneld (1995) that 'the very idea of learning presupposes a simultaneous awareness of something both staying the same and changing' (in Marton and Booth, 1997, p 104). This idea supersedes the useful, yet reductionist understanding of focal understanding on one aspect of an experience at a time, and rather points towards learners having simultaneous awareness of multiple aspects of a situation, which comprise the experience. Moreover, the seemingly paradoxical idea of a learner being simultaneously aware of something as changing and remaining the same is explained as founded on the Piagetian notion of a 'child, for example, see[ing] instances of improving a certain skill distributed temporally and spatially as being instances of improving the very same skill, and thus, by belonging together, constitut[ing] learning' (op cit).

By extension, learning can happen through learning to experience. This involves

> the learner ha[ving] developed a capability to experience a certain phenomenon [learning] when it appears in novel situations in a particular way (which goes beyond the other ways in which she has been capable of experiencing that phenomenon), which in turn means that the relationship between the learner and the phenomenon [learning] has changed. (op cit, p 142)

In simpler words, learning to experience happens as qualitative changes in learners' awareness of experiencing learning, which resonates with Illeris' (2007) capacity change. Metalearning, therefore, can be viewed as a learner's developed capability of experiencing learning in a particular way, beyond those ways she had been capable of experiencing it before.

Although each person might have their own particular way of experiencing a situation, Marton and Booth (op cit) suggest the existence of a relevance structure, understood as a person's experience of what the situation calls for, or in other words, which aspects of their experience are most relevant to the situation being experienced. As far as metalearning is concerned, although theoretical emphasis on the context or the social situation of learning (most often understood as classroom learning) has been there since its inception, no empirical data exist on how learners learn through developing their capability of experiencing classroom learning in particular ways, nor does any conceptualisation exist of the impact of the relevant structure of a classroom on pupils' development of ways of experiencing learning. Although Marton and Booth (op cit) argue that there are ways of experiencing learning that are closer to the educational norm, they are no more specific as to what that norm entails and how exactly it is experienced by learners.

My own framework takes account of this relevant theorisation of learning as capacity development for experiencing classroom learning, and seeks empirical clarification on multiple aspects of metalearning: what the norm of experience is in a specific classroom, how pupils become aware of that norm, and how they develop their metalearning (learning to experience learning) in relation to that. The most significant contribution of this phenomenographic approach to understanding classroom metalearning in my research is its understanding of the collective experience as a range of individual ways of experiencing that is particular to the context. 'In phenomenography', Marton and Booth (op.cit.) write, 'individuals are seen as bearers of fragments of different ways of experiencing a phenomenon, and as the bearers of fragments of differing ways of experiencing that phenomenon' (p 114).

Rewriting this claim for metalearning produces the following addition to existent conceptualisations: Individual learners are seen as bearers of fragments of different ways of conceptualising/making sense of classroom learning, and as the bearers of fragments of differing ways of experiencing (understanding and applying themselves) to classroom learning.

A particularly interesting contribution to understanding experience is the relationship between simultaneity and awareness discussed by Marton, Runesson and Tsui (2004). It is a fundamental premise of phenomenography that the simultaneous discernment of different aspects of an experience is what constitutes that sum of aspects as an experience. Marton, Runesson and Tsui (op cit) suggest that awareness of an experience entails being aware of how one is experiencing something at the moment, and how one has experienced the same thing in other instances in

the past. This simultaneous awareness allows a person to discern variation in the aspects of experience they associate with that which is experienced, and thus learn from experience. Two types of simultaneity emerge as seminal: diachronic simultaneity, described as 'the simultaneous experience of different instances at the same time' (op cit, p 17), and synchronic simultaneity, described as 'the experience of different co-existing aspects of the same thing at the same time' (op cit, p 18).

The importance of this distinction for researching experience (in the case of this research, metalearning), lies in the type of reflection a person can engage in, in order to make sense of their experience of learning. Reflection for diachronic simultaneity can allow for simultaneous awareness of past experiences of the same object (making sense of experiences of classroom learning), and reflection for synchronic simultaneity can allow for simultaneous awareness of aspects of metalearning encapsulated in a single experience of classroom learning. Simply put, a person's metalearning can be accessed through reflective accounts of learners' sense they have made of their sum of experiences on classroom learning, and also through reflective accounts on making sense of specific experiences of classroom learning.

B.2 Situation Awareness

A constructivist model associated less with classrooms and 'designed' contexts, but rather with individuals' understanding and reaction to military environments is that of Situation Awareness. The need for individuals to make accurate sense of a context in order to navigate it quickly and efficiently has been described through a number of models, with most of them, however, having a cognitivist perspective on the individual as reacting to the context. Interestingly, a shift towards constructivism is also evident in this field, with Endsley's (2015) model proposing that awareness is constructed through 'an iterative process, with understanding driving the search for new data and new data coming together to feed understanding' (Endsley, 2004, p. 319).

Endsley's (op cit) understanding of the individual's drive to understand a situation/context is that it is a drive to relate and interact with the situation/context, and that it depends both on individual factors (goals and objectives, expectations, memory, information processing mechanisms, automaticity) and task system factors (system capability, interface design, stress and workload, complexity, automation). In her 1995 model, Endsley schematises abilities,

experience and training (all products of previous learning) as determining a person's three stages of dynamic decision-making: 1. perception of elements in current situation, 2. comprehension of current situation, 3. projection on future status. Endsley's elegant and detailed flow charts (included in her 2015 review of her own work on Situation Awareness) highlight individuals' selective awareness of specific features of situations being processed through already existent (constructed in/through previous experiences) mental models and resulting in goals, plans, and scripts that are translated into actions and, most importantly, feed back onto individuals' perceptions of situations.

This model is quite important for conceptualising an individual's process towards metalearning, and particularly the stages of a learner's sense-making of classroom learning. Moreover, Endsley's understanding of navigating situations/contexts as driven by one's capabilities, sense-making and goals provides an interesting platform for regarding metalearning as a strategy (discussed further along in this Chapter).

B.3 Knowledge about knowing

The range of theories mostly associated with metalearning are those focusing on the development of an individual's awareness of knowing. A learner's journey starts from not knowing what they don't know, progresses onto knowing what they don't know, then on to knowing that they know, or not knowing that they know.

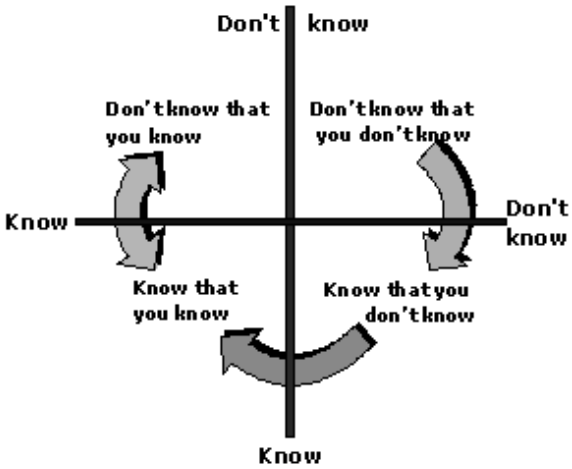


Figure 5. Model of awareness of knowledge and competence

The origin of this model, often credited to Dubin (1962), is unknown, with Atherton's (2013) review suggesting that it has considerable provenance since it can be traced back to an Arabic proverb (cited in Neighbour, 1992). This model has been used to describe awareness of knowledge, as well as the development of competence (Noel Burch for Gordon Training International 1970s, not published), and also as a heuristic exercise allowing people to develop awareness of how they relate to others and themselves, commonly known as the Johari window (Luft and Ingham, 1955).

In metalearning theory, this model has been used by Watkins (2001) to describe a learner's state when approaching any new knowledge, which may reflect their current sense of competence and view of the need to learn. More specifically, Watkins (op cit) suggests that this model applies more to metalearning than learning when used to describe a learner's conscious/unconscious need to learn a skill or knowledge, as related to their competence on that skill/knowledge. In that sense, becoming aware of the need to learn something is directly related to how much one already knows about it. By extension, ascertaining the need to develop one's metalearning further and in specific ways, depends on the metalearning knowledge they have constructed until the point at which this ascertainment was made.

This view on developing metalearning is subject to two very interesting conundrums: the Dunning-Kruger cognitive bias, and its inverse, the impostor syndrome. The Dunning-Kruger bias, or effect (1999) manifests when incompetent individuals are unable to accurately assess their level of competence, due to their being unaware of it (they can't know what they don't know). In metalearning terms, this would translate into learners with low skill/knowledge about learning competence being unable to accurately assess the degree of their incompetence and thus bridge it. The impostor syndrome, on the other hand, suggests the idea that a learner might be highly competent in terms of knowledge and skill about learning, but be unaware of it or dubious. Both these states appear insuperable, and appear to require some sort of awakening, or light bulb moment that will alert individuals to better understanding of metalearning. Mezirow's (1990) concept of transformative learning being supported or initiated through critical reflection is one theory that addresses this issue. This view is also relevant to the Vygotskian one that change in mental functioning can be seen not as the result of a linear process (or indeed flow as seen in Atherton's chart), but rather as the result of quantitative changes leading to qualitative transformation (Mahn and John-Steiner, 2013). This proposition is also congruent with Marton's phenomenographic approach presented above, since both

suggest that acquiring knowledge and experience leads to further knowledge about experiencing and the occurrence of qualitative change/transformation.

However, the lack of empirical studies on metalearning in classrooms does not allow for an in-depth view on the impact the problematic states under discussion might have on learners developing metalearning in a specific context, nor on the process which allows learners to overcome those states.

C. Sense, sense-making and meaning

All definitions of metalearning I have encountered and presented in my review of the Literature both in this Chapter and the previous one, posit that making sense of an experience is seminal for metalearning, without, however, specifically defining sense. This I believe is partly due to sense-making being axiomatic to all constructionist theories to such an extent that a definition might be deemed superfluous, and partly due to its alternating use with meaning and understanding, but also with reflection, widely regarded as the process underpinning people's constructing understanding.

Of all works on metalearning, Carnell et al.'s accessible 2000 publication on Learning about Learning is the one that addresses making sense more directly. Learning as sense-making is viewed as 'an active process of relating new meaning to existing meaning, involving the accommodation and assimilation of ideas, skills, thoughts and so on' (p 4). Even here, however, the word 'meaning' is used to define and describe 'sense', which hardly helps readers distinguish between the two.

The clearest distinction between sense and meaning is, in my view, the one made by Vygotsky in his seminal work *Thinking and Speech* (1987). In this book, Vygotsky proposes that sense and meaning are two distinct, yet interdependent aspects of verbal thinking, and both are related to the use of language. This constitutes a departure from Piagetian constructivism, which uses sense and meaning interchangeably to denote the two subprocesses of construction, accommodation and assimilation. Vygotsky links sense and meaning to concept formation through placing higher emphasis on cultural mediation, as seen in the role of the context, or in his words, the milieu.

In the elucidating Mahn and John-Steiner (2013) review of Vygotskian theory, the relationship between sense and meaning comprises a system of meaning:

> A word's sense is the aggregate of all the psychological facts that arise in our consciousness as a result of the word. Sense as a dynamic, fluid, and complex formation has several zones that vary in their stability. Meaning is only one of these zones of the sense that the word acquires in the context of speech. It is the most stable, unified, and precise of these zones. In different contexts, a word's sense changes. In contrast, meaning is a comparatively fixed and stable point, one that remains constant with all the changes of the word's sense that are associated with its use in various contexts). (p. 132)

Another interesting contribution by Vygotsky (1987) is the notion that sense that is derived from particular experiences in specific contexts is incorporated into existent systems of meaning that are unique to each individual. This view suggests that 'to some extent, sense is unique to each consciousness and for a single consciousness in varied circumstances' (p 276), yet both sense and meaning develop through the internalisation of sociocultural meanings.

What this perspective could add to metalearning is an emphasis on language and milieu, and a very cautious research approach in regards to what people talking about their own metalearning talk about. Descriptions of making sense of a classroom are also likely to be intertwined with incomplete, yet more fixed meanings they have ascribed to the classroom, learning, and themselves as learners.

D. Strategy

The use of the word strategy in educational theory and praxis is as unclear as that of sense and meaning I presented above. Learning strategies are cognitive plans oriented toward successful task performance (Schunk and Zimmerman, 2013; Pressley et al., 1990; Weinstein and Mayer, 1986), and can address learning in general (i.e. verbalization, Schunk and Zimmerman, 2013; rehearsal, Nelson and Narens, 1994), specific processes necessary for learning (i.e. mnemonics, Hattie and Yates 2014), or subject-specific learning (i.e. argument architecture, Chiang et al, 2015). The term strategy is also closely linked to metacognition since Flavell's original work (1979), with planning and evaluating considered to be both metacognitive strategies and skills (Efklides, 2008). Use of the term strategy in relation to metalearning can be traced back to the

1980s, not long after the emergence of the construct, and has since appeared in a number of publication titles including the terms metalearning and strategy (Novak, 1984; Adey and Shayer, 1988; Chan and Stolfo, 1993; Sanchez, 1993; Lei, Hitt, and Bettis, 1996). An important issue in all these publications is the lack of definition of the term strategy¸ and its interchangeable use with the term plan in all three fields of learning, metacognition, and metalearning.

The ubiquitousness of the term strategy and theorists' preference toward it rather than the term plan is attributed by Freedman (2013) to 'strategy remain[ing] the best word we have for expressing attempts to think about actions in advance, in the light of our goals and our capacities' (p x). In his 2013 'History' of the term strategy, Freedman reviews a vast number of definitions of the term and proposes that researchers and theorists consider the concept of strategy as defined in its original field, military studies (strategy was incepted as a product of a need to advance warfare beyond direct matching of forces through the introduction of better management of resources, Freedman suggests). Lykke Jr.'s 1989 definition is helpfully clear:

> One common contemporary definition describes it as being about maintaining a balance between ends, ways, and means; about identifying objectives; and about the resources and methods available for meeting such objectives. (p. 3)

Although not every aspect of human life requires strategic thinking, strategy is required when circumstances or individuals oppose or hinder opposing interests or concerns. This means that strategy is more than a plan, according to Freedman (2013), who defines a plan as a sequence of events that allows one to move with confidence from one state of affairs to another. Factoring conflict of interest and the dramatic unpredictability of human affairs it encourages, results in describing strategy quite differently. Summarily, strategy

> is often expected to start with a description of a desired end state, but in practice there is rarely an orderly movement to goals set in advance. Instead, the process evolves through a series of states, each not quite what was anticipated and hoped for, requiring a reappraisal and modification of the original strategy, including ultimate objectives. (p. xi)

Contemporary views of strategy stress its fluid and flexible nature, which is governed by its starting point rather than the end point. The most relevant developments to learning and metalearning in the systematic study of strategy have been produced in organisational and business psychology. After the decades of 1950 and 1960, US and global social circumstances

led companies and organisations to reframe and address the use of strategy in its classic military sense, while in sociology the influence of postmodernism encouraged lateral consideration of human affairs, and the consideration of organisations as social systems. This meant that organisations started being viewed as institutions each with its own strategy for production and management of resources and workforce, and individual workers or groups of workers in those institutions as having their own strategies for actualising their particular goals within the organisation.

An important connection between strategy and constructivism was established at that stage of the development of strategy by organizational psychologist Karl Weick (1969), who drew on a range of disciplines and introduced into the lexicon of organisation psychology the term sense-making (the process by which people ascribe particular understanding to experiences). Weick deems sense-making necessary, because individuals must operate in inherently uncertain and unpredictable environments. A second connection between strategy and constructivism was made by Mintzberg and Waters (1985), who propose the reconsideration of strategy beyond that as a single product handed to others for implementation, but rather as a 'pattern in a stream of decisions' (Freedman, 2013, p 554). On this basis, if the strategy is realized as intended then the strategy is deliberate, but patterns that were realized despite of, or in absence of intentions were emergent.

Mintzberg and Waters' distinction between intended and unintended strategies provides valuable insight for considering metalearning in classrooms, due to its establishing a link between the intentions of individuals and their ability to actualise those intentions in specific contexts. According to Freedman (2013), 'a deliberate strategy depends on the intentions disseminated in an organization being precise, so there could be no doubt about what was desired, and realizable' (p. 554). It is rather difficult to imagine a classroom structured and transparent enough for every problem requiring strategic resolution to be anticipated and controlled. It is equally difficult to conceptualise a classroom in which only emergent strategies are actualised and yet some structure remains, due to a complete absence of intention. A decidedly constructivist perspective on strategy and intentionality is Minzberg and Waters'

> idea of the environment imposing a pattern of decision, as if notional decision-takers could not help themselves in the face of structural constraints and imperatives they faced. Innumerable small decisions taken throughout the organization [in this case, the

> classroom] could move it an unanticipated place, to the surprise and possible consternation of senior management [teachers, etc]. (Freedman, 2013, p. 555)

Understanding strategy through this brief review has two important conceptual implications for metalearning: strategy being a term appropriate for discussing metalearning rather than metacognition, due to its open-ended nature, and also highlighting that people's use of strategies in specific contexts are dependent on the balance each context allows between the actualisation of intended strategies or emergent ones.

As far as the distinction between metacognitive plans and metalearning strategies is concerned, metacognition is widely considered to be a process which the learner activates to address specific content-related and knowledge-related demands and resolve those through cognition alone. As such, metacognition is actualised through plans which are comprised of the linearly sequenced stages of planning, monitoring, and evaluating, and have a predicted, predesigned outcome. On the other hand, metalearning is a process activated when a learner experiences learning through cognition, affect, motivation and understanding of a context, and constructs their understanding of themselves as a learner by making sense of that experience, and using it to evolve as a learner. As such, metalearning is actualised through strategies, due to its open-ended and flexible self-development outcome.

The second implication of strategy theory on metalearning impacts researching metalearning in classrooms, by providing an interesting perspective on the relationship between context and strategy design and use. As discussed, it is rather impossible to conceptualise classrooms which encourage either imposed patterns (metalearning strategies), or only unanticipated ones. Understanding a classroom as a context allowing a balance that is unique to it between the two types of strategy raises questions of agency and intentionality in metalearning strategy design and use by pupils: on the degree to which the classroom imposes metalearning strategies on them, and also on the degree to which they actualise their own or classroom strategies intentionally.

E. The basic premises of an original framework for metalearning

As discussed in Chapter 2 in relation to the history of metalearning, although the term itself has been used since 1979, little progress has been made in regard to understanding metalearning as a personal process. The need for a comprehensive and cohesive theoretical framework for describing personal metalearning is directly connected to the need for clearly listing the theoretical and epistemological principles commonly accepted as comprising metalearning. I view my own effort toward constructing an original theoretical framework for metalearning as an effort to a. clarify the principles associated with personal metalearning in existent theory (vis conclusion of previous Chapter), and b. clarify and add to the theoretical underpinnings of the concepts comprising metalearning, in order to achieve better theoretical cohesion and overall conceptual advance.

The first premise on which my own framework is constituted is epistemological consistency. Specifically, situativity, and the importance of context on metalearning have already emerged and are gaining prevalence in the field. Although this focus on context has long been valued in theories and studies on learning through the wide endorsement of socio-constructivist perspectives, it is rather new to the field of metalearning and especially to the strand exploring metalearning as a personal process. My own framework regards metalearning as a fundamentally situated activity, and proposes that it can be understood as a learner's sense-making of learning as framed in a particular context.

This present Chapter built on that conceptual foundation by presenting a consideration of terms and constructs that would further and strengthen conceptual consistency and cohesion. In brief, my original framework is constituted by a specific definition and description of the form and function of: experience, learning from experience/sense making, awareness, and strategy, all concepts already affiliated with metalearning.

My own contribution is a systematic interpretation of Carnell et al.'s (2000) fundamental definition of metalearning as making sense of your experience of learning. An individual experiences learning in a specific context, meaning they experience in a manner that is temporally, locally, and culturally bound and unique. Experiencing learning involves becoming aware of what learning involves in that specific context, and making personal sense of how those experiences can be interpreted and used to improve further experiences (of learning).

Sense-making is a personal process which involves being aware of and orchestrating (regulating) one's cognition, affect, and motivations (about learning and being a learner), which are socially mediated, meaning influenced and moderated by the context. The overall way in which a learner has and/or plans for executive control over their awareness, sense-making, regulation (intrapersonal and with their context) is unique and idiosyncratic, and constitutes a metalearning strategy.

Chapter 4: METHODOLOGY

Part 1- A THEORETICAL APPROACH TO EMPIRICAL ENQUIRY

Dowling and Brown (2010) define research as 'an enquiry that seeks to make known something about a field of practice or activity that is currently unknown to the researcher' (p 6). In his Approaches to Social Enquiry, Blaikie (2007) presents and discusses the choices a researcher makes while building her qualitative inquiry. Each decision informs the next and is laterally informed by it, to build a coherent, sound research framework.

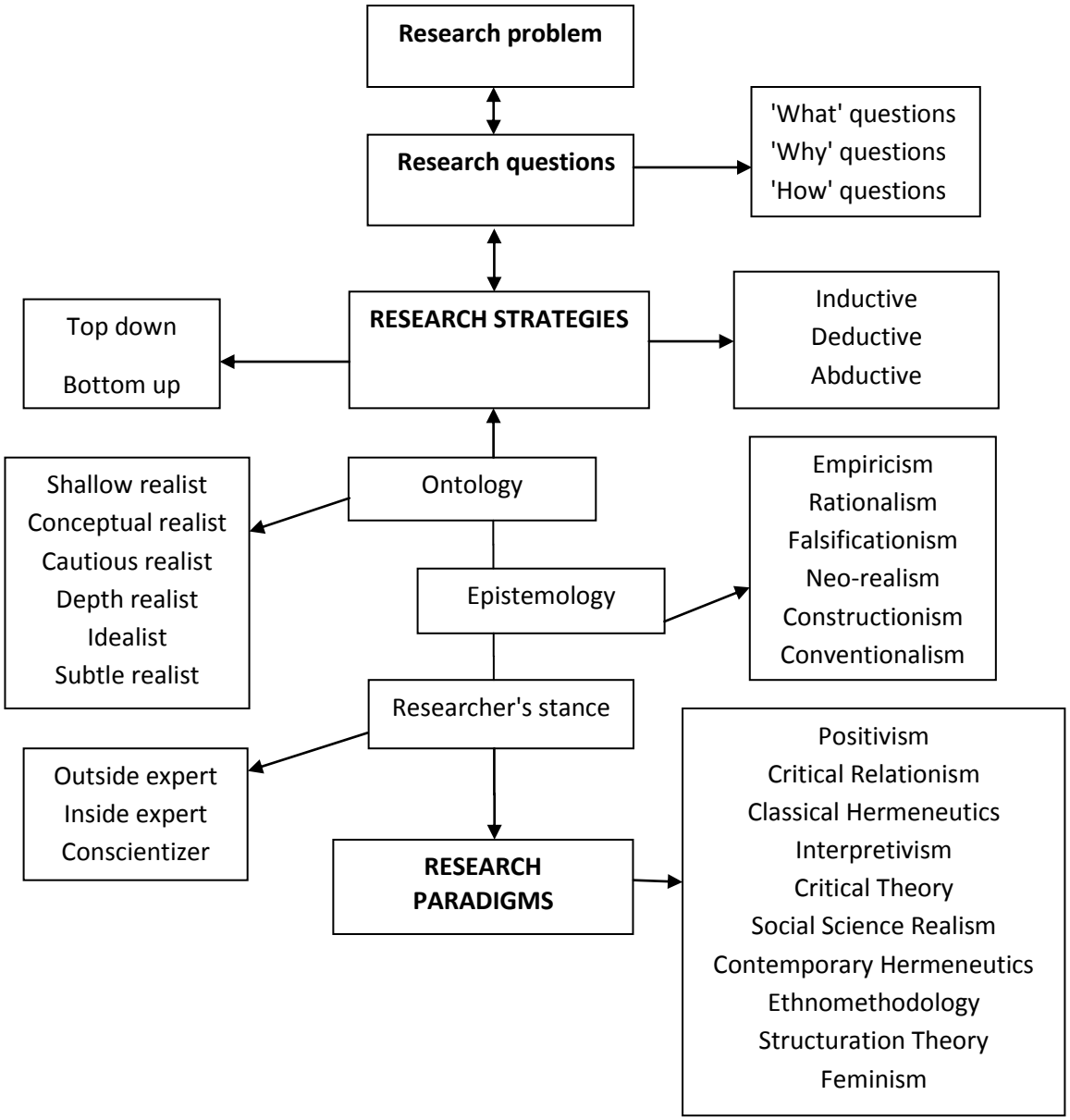


Figure 6. Choices available for designing enquiries (Blaikie, 2007 p. 27)

Although there are a number of valuable perspectives on structuring approaches to social enquiry, I choose to follow Blaikie's (op cit) to delineate my own. This choice is informed by my consistent intention to approach this research as an effort to make clear the underpinning rationales and rationalities of the construct of metalearning.

I hereupon adhere to Blaikie's framework in order to: a. elucidate the philosophical underpinnings of metalearning, b. design my own enquiry as aligned to and congruent with those underpinnings, and c. identify conceptual gaps or discontinuities in the conceptual framework of metalearning in which to situate an original enquiry. In his comprehensive flow-chart, Blaikie (op cit) suggests that certain decisions are interrelated (signified by double-headed arrows). Decisions regarding the research problem, research questions, and the choice of research strategies and research paradigms constitute the basic framework, and are interrelated. There are also secondary, or satellite decisions to be made. The interrelation between research strategies and research paradigms relies on decisions to be made on ontology, epistemology, and the researcher's stance. Blaikie (op cit) underscores that this ordering indicates a need for moving back and forth before solidifying a coherent framework. Since such a depiction is quite accessible for the presentation of a research framework, I will begin by delineating my research using Blaikie's (op cit) model.

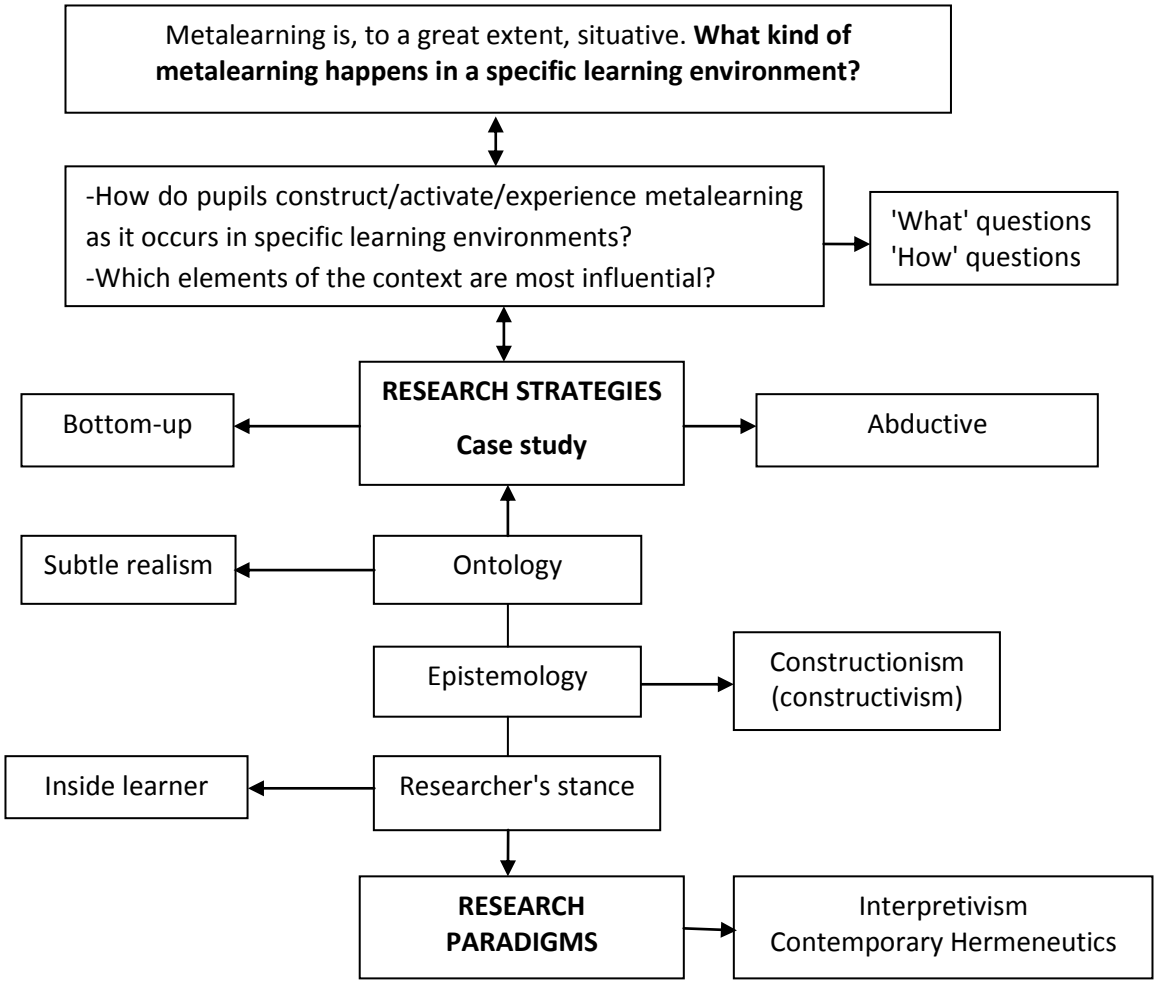


Figure 7. Conceptual map of theoretical elements in my research

Following this flow-chart, I will elaborate on the theoretical principles underpinning metalearning by grouping them into spheres of influence (A, B, C). Firstly, I will state my rationale for choosing my research problem, and will construct questions that will be used to address it (Segment A). Secondly, I will expand on the research logic congruent with my choice of research strategy (Segment B). Lastly, I will discuss my choice of research paradigm through a discussion of the ontological and epistemological perspectives underpinning my conceptualisation of metalearning, and my approach to enquiry on that conceptualisation (researcher's stance) (Segment C)**.** Figure 1.2 will be recurrently used for schematization and clarification.

The aim of this discussion is to showcase the congruence of my own original conceptualisation of metalearning with existent ones, and to highlight its development from them. Moreover, since this is the first empirical research on metalearning in classrooms, the value of considering

how an entirely theoretically delineated construct can be explored methodologically sets a basis for further dialogue and research-based development in the field.

A. Research problem: Research Questions.

A.1 Research Problem

All social enquiry needs to address a research problem (Blaikie, 2007, p 6). The process of identifying a situation as a research problem is 'the act of declaring an interest' (Dowling and Brown, 2010 p 6). As seen in the previous two chapters of this thesis, this work is focused on understanding how metalearning manifests in the specific learning environment of a classroom.

To briefly review how literature on metalearning has come to encompass the idea of situativity, it is necessary to make reference to the influence of particular environments on a person's sense-making of their learning and themselves as learners (for an extensive review, vis Chapter 2). Understanding metalearning as a personal process of sense-making has significant socio-constructivist underpinnings: it supposes a personal engagement with understanding the world through making sense of it. A specific focus on learning, instead of reality or world, requires indentifying where a person experiences learning in the world. Although learning can potentially occur in a variety of environments, literature on metalearning has a consistent focus on formal educational environments, due to their providing learning experiences in a systematic, consistent, long-term manner.

It is important to reassert that the development of metalearning has mostly been furthered by theorisations and studies on how schools and classrooms can teach, or teach for metalearning. As a consequence, theoretical understanding of metalearning as a personal understanding of classroom learning has been indirect, and extremely limited. In order to privilege a person's capability for making sense of their experience of specific learning environments, or classrooms, my research problem does not address teaching for metalearning.

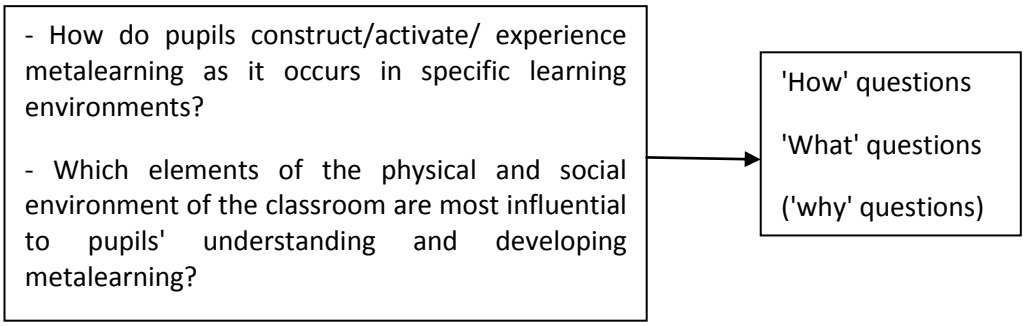
Nevertheless, the strong situativist perspective evident in metalearning literature suggests that learners can indirectly be taught how to do metalearning, by value of them experiencing

learning in classrooms having, communicating, and perhaps imposing specific ideas about how learning is to be done and understood. My own interest lies in the extent of the influence a specific learning environment has on learners' metalearning, and is expressed in the following research problem:

> Metalearning is, to a great extent, situative. What kind of metalearning happens in specific learning environments?

A.2 Research Questions

Choosing to focus on the problem of how metalearning can be constructed and seen in real-world empirical settings leads to specific research questions aiming to point empirical enquiry into more specific areas of interest. My interest lies in understanding what metalearning is for pupils, and how their experience of it can become accessible to the researcher. Since my goal is understanding, and not simply providing an account of metalearning events, I choose to use 'what' and 'how' questions:



Blaikie (2007) provides a typology of questions, on which I will elaborate to justify my choice of questions.

- RQ1: - How do pupils construct/activate/ experience metalearning as it occurs in specific learning environments?

RQ1, is a 'how' question, and therefore concerned with bringing about change, with intervention and practical outcomes (Blaikie, op cit, p7). Such a definition seems incompatible with my research goals, since the only practical outcome of this research is the overarching aim of understanding the type and influence of metalearning that happens in a classroom. To ameliorate the precision of my research questions, I now need to unpick the nuances included in RQ1, and develop two sub questions:

- RQ1a: What accounts do pupils construct of their metalearning as it happens in the context of their classroom?
- RQ1b: Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do?

Now having two sub questions phrased as 'what' and 'why' questions, I can list all my research questions as 'what' and 'why' and ‘which’ questions:

- RQ1a: What accounts do pupils construct of their metalearning as it happens in the context of their classroom?
- RQ1b: Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do?
- RQ2: Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning?

According to Blaikie (2007), 'what questions require a descriptive answer; they are directed towards discovering and describing the characteristics of, and patterns in, some social phenomenon (p7). In this research, I aim to first and foremost describe the parameters under which metalearning is understood, constructed, and developed by learners. I need to know what awareness and understanding of metalearning pupils have, what previous knowledge about learning they build new metalearning on (RQ1a), which learning experiences pupils mostly make sense of, and which situational demands help them further/recontextualize/reconstruct their metalearning strategies (RQ2).

Also, by asking what accounts learners construct (RQ1a), I am stating my intention to not only focus on the content of pupils' accounts, but also on how they structure their accounts of metalearning. This could potentially provide insights into the personal and internal process of metalearning. Blaikie also states that 'why questions ask for either the causes of, or the reasons for, the existence of characteristics and regularities in a particular phenomenon. They seek an understanding or explanation of the relationships between events, or within social activities and processes' (p 7). The aim of this research, which extends to providing an explanation to what happens in the classroom in regard to metalearning, means seeking the links between what students experience and describe and the subjective rationales or non-subjective parameters that underpin that experience. By seeking to explain why pupils construct and activate metalearning strategies when and as they do in the classroom, I aim to explain the relationship

between the affordances and constraints that the social and physical environment of learning places on pupils, and how the latter adjust and respond to the context in terms of metalearning. In other words, my research also asks why pupils choose to use (or to not use) certain cues and situations in their in context in order to orchestrate their metalearning strategies.

Thus, a sequence of 'what' and 'why' questions is formed to answer the research problem. According to Blaikie (2007), special emphasis needs to be placed on sequence, since 'what' questions normally precede 'why' questions', and 'we need to know what is going on before we can explain it' (p 7). This sequential framing of an enquiry based on 'what' and 'why' questions seems to carry particular implications regarding the status of overall research in the whole field. Usually, 'what' questions are used in applied research projects with limited or no previous research, in order to provide an adequate description and establish a domain for research problems. In Blaikie's view, research in which 'why' questions follow 'what' questions already has an adequate description available to it, and the researcher can proceed to providing explanations for it. Research on metalearning presents an interesting case, because several theoretical frameworks have been constructed to describe the phenomenon, yet no adequate links to the empirical sphere have been established. There exists, therefore, a bricolage of descriptions, but efforts to linking their components to specific empirical domains, and in particular early primary education, are insufficient to say the least.

Since, however, research on constructs that are viewed as situative is potentially inexhaustible due to the plurality of cases representative of an equally plural and diverse social reality, the research questions, my vectors of access into the research problem, need to be translated into a specific plan for action. Specificity inevitably constrains all research to a particular strategy, a logic that underpins the researcher's view on theory, the empirical world, and gaining balanced access to both by virtue of empirical research.

B. Type of logic: Research strategy.

What is required in order to answer the research questions chosen is a logical procedure for generating new knowledge. Choosing such a research strategy means having a starting point and a set of sequenced steps by which research questions can be addressed. The choice of research logic being the primary concern, decisions also have to be made regarding the chosen logic's explanatory grounding, as well as the overall methodological framework/strategy which best serves both logic and grounding for generating explanations.

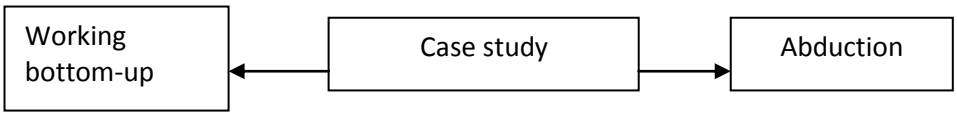


Figure 7a. Research logic and strategy

B.1. Type of Logic

My approach to researching being understanding how learners metalearn in the classroom includes the choice of using the research strategy of abduction. Abduction stands as an alternative to pure inductive, and deductive research logic, and is concerned with 'constructing theories that are derived from social actors' language, meanings and accounts in the context of everyday activities' (Blaikie, 2007, p 89). Scott and Morrison (2005) frame abduction as a research strategy aiming to provide an insider's perspective into the beliefs and practices of individuals constituting the subject matter of research. Blaikie (2007) posits its starting point at the social world of the social actors being investigated. Using abduction aims at discovering such social actors' constructions of reality, conceptualizations, meaning-making mechanisms and tacit knowledge of the social systems they navigate.

Accessing this social reality is a multi-layered process, and, to Scott and Morrison (2005), includes consideration of 'the way educational researchers go beyond the accounts given by social actors about their plans, intentions and actions in the real world' (p. 1). The first layer consists of collecting data on social actors' perceptions of their social reality through self-report measures, with the ultimate aim of constructing a transparent representative delineation of the social reality under investigation. The second layer of abduction consists of transcribing the previously collected lay accounts into theorised nexus of relationships. Redescribing

participants' accounts produces systems of scientific typifications leading to understanding the motives and actions and provides a basis for further explanatory actions.

This second layer of producing representations has been subject to debate from opposing interpretivist theorists, disagreeing on the degree to which re-descriptions of social reality are an invasion to it, and a colonisation of participants' views of reality by way of social scientific constructs. Most theorists, and particularly educational researchers subscribe to Giddens'(1984) view of representation in interpretivism, counter proposing that 'all social actors, no matter how lowly, have some degree of penetration of the social forms which oppress them' (in Scott and Morrison, 2005 p 2), and therefore address social scientific explanations in terms of their own degree of access to social reality.

Blaikie (2007) summarizes the process of abduction in research as follows: ‘Everyday concepts and meanings provide the basis for social action/interaction about which social actors can give accounts from which social scientific description can be made from which social theories can be generated or which can be understood in terms of existing social theories or perspectives’ (p. 90). Abduction is therefore a research logic aimed at accessing and relaying re-described accounts of social reality to the maximum extent possible of fidelity to participants' understanding and experience. Educational research on metalearning can be well served by abduction, since its starting point and final goal is accessing participants' understanding of social reality. In my research, I aim to understand which elements of their social reality of the classroom pupils combine into constructs/strategies in order to access and further their understanding and learning.

B.2 Explanatory Grounding

Among the distinct differences between abduction and its alternatives (induction, deduction) is, as I previously stated, the approach they take to grounding explanations that they produce. The most common approaches are the top-down approach and the bottom-up approach, which translate into testing existing or postulated theories by trying to establish their existence in the empirical sphere (deduction-abduction: top-down), or, alternately, deriving theory and concepts from real-world research situations (induction-abduction: bottom-up).

My research, being based on abduction, belongs with the bottom-up approaches. That is due to both the importance placed on accounts of social reality produced by participants and the state of knowledge in the field. Metalearning as a personal process is insufficiently theorized and what theorization has been proposed has been based on empirical findings of studies in different research objects. It is therefore my view that at this stage in the development of the construct, the field would benefit mostly from a better understanding of what metalearning is and how it happens.

This bottom-up stance to producing explanations is highly relevant to the researcher's stance towards research, presented further down in segment C3.

B.3 Research strategy

So far, I have followed a rationale of progressive specificity in setting research parameters addressing my research problem. To summarize my approach: Metalearning is to a great extent situative, and I am interested in finding out about the relationship between the context of a primary classroom and the type of metalearning constructed by pupils experiencing it. More specifically, I want to enquire into the accounts of metalearning pupils produce, the rationale for producing them, the way in which they act them out in the classroom, and the elements of the context that prompt them to do so. I choose to access that experience by mainly relying on participants' accounts of their lived experience, and through that to inform theory using a bottom-up approach.

Blaikie's framework does not match or recommend matching a research strategy with a single research design or framework, I will therefore match my strategy with my design through a process of exploring seminal theoretical issues that are linked to the research problem and accessing metalearning in general (vis Chapter 4 Part 2, Operationalisation). The choice to follow an abductive approach/strategy highlights a number of research designs compatible with accessing my (meta)theorization of metalearning. Designing research on situated metalearning requires placing special emphasis on enquiring after aspects of metalearning that become visible as affordances or constraints placed on pupils by/in particular contexts.

C. Ontology, Epistemology, Researcher's Stance, Research Paradigm.

The second major cluster of theorisations necessary for constructing an enquiry is relevant to the choice of research paradigm. Research strategies are part of the wider frameworks of research paradigms, and are influenced by assumptions about the nature of social reality (ontology), and about the type and extent of access to knowledge of such a reality that can be grasped (epistemology). Ramazanoglu and Holland (2002), emphasize that this process of establishing a coherent line of thought requires making connections between ideas, social experience, and social reality:

- Ideas refer to the ways of conceptualizing and making sense of experience and reality - such as concepts, theories, knowledge and other interpretations.
- Social experience refers to individual conduct, social relationships and cultural practices in everyday life, and to the everyday interpretations and meanings associated with these.
- Social reality refers to the material and socially constructed world within which everyday life occurs, which can have an impact on people's lives, in terms of both providing opportunities and imposing restrictions. (p 9)

For this research, my framework is as follows:

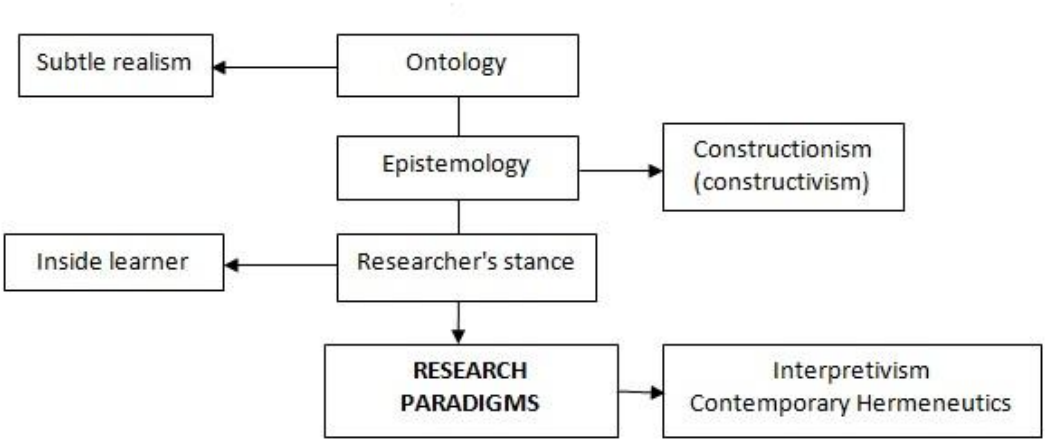


Figure 7b. Research framework

C.1 Ontology

Ontology 'is a branch of philosophy that is concerned with the nature of what exists' (Blaikie, op cit, p. 13), and in the case of social sciences it is concerned with the nature of social reality. Each paradigm applied in a specific domain of interest makes claims about 'what kinds of things do or can exist, the conditions of their existence, and the way in which they are related' (op cit).

Metalearning as a construct belonging to the domain of education, and my own theoretical framework in regard to ontology is, in Blaikie's terms, a constrained/subtle realist ontology. Subtle realism is expressed through 'views which accept that the existence of an external world places both constraints and opportunities on the reality-constructing activities of social actors' (Blaikie, 2007 p. 17), or views 'that although we always perceive the world from a particular viewpoint, the world acts back on us to constrain the points of view that are possible' (Seale, 1999 p. 470). This view chimes with the socioconstructivist views underpinning the construct of metalearning, and also reflects Giddens' (1984) view that social actors access structures that oppress them. In Seale's (1999) view, a conundrum exists between subtle realism and pure constructivism, with the former subscribing to a reality existing beyond language, and the latter stating that there is no possibility of knowing a real world that exists beyond language. I remain partial to subtle realism by subscribing to 'truths' corresponding to reality as fallibilistic and provisional, until research demonstrating better correspondence between 'truths' and reality emerges.

Summarily, my point of access to social reality is Blaikie's (op cit) following view on social action and actors, with an added element that constraints (imposed by our social world) exist that limit the points of view that are possible:

> Humans, unlike things in nature, have culture and live in a world of lived interpretations. Social action is not mere behaviour but, instead, involves a process of meaning making. It is the meanings and interpretations created and maintained by social actors that constitute social reality for them. Social reality consists of the shared interpretations that social actors produce and reproduce as they go about their everyday lives (p. 17).

It is useful to conclude my statement of ontology with Blaikie's assertion that researcher/theorists' ontologies do not need to identify with those of lay people/participants, and while the former usually belong in the idealist spectrum, the latter are most likely to be

'shallow' or 'naive' realist. This inconsistency is attributed to lay people's view of reality as a consequence of reification, and what the theorist views as a construction the layperson views as having an independent existence. In terms of my own research, it is therefore highly likely to include realist ontologies in participants' answers and attitudes, whereas my own remains a subtle realist, that is, I recognize that ideas and language mediate a reality that is externally there.

C.2 Epistemology

An epistemology is a theory of knowledge, according to Blaikie (2007), which provides a philosophical grounding for establishing what can be known out of the things that exist, already decided on in ontology. Such a theory has pervasive implications for research practice, with the main question being 'what is the relationship between the researcher and that being researched?', the main characteristic being 'the researcher attempts to lessen distance between himself or herself and that being researched' (Cresswell, 2007, p. 17).

My research identifies with a constructionist epistemology, as it has a subtle realist ontology and places emphasis on how individuals interpret their own reality. Knowledge, in this view, is not discovered or emergent outside this reality, but is instead 'the outcome of people having to make sense of their encounters with the physical world and other people' (Blaikie, 2007 p 22). More specifically, research on how pupils construct their metalearning is based on the social-constructivist branch of constructionism. Social constructivism has an intersubjective view of meaning-making with an emphasis on processes of social mediation of meanings (Schwandt, 1994; Blaikie, 2007; Crotty, 1998).

Seale (1999), and more recently Scott and Hargreaves (2015) amongst others, have described constructivism as an ontological theory as it relates to learning, and it is only for the sake of following Blaikie's taxonomic diagram that I discuss constructivism in this segment, for purposes of facilitating the reader. In Scott and Hargreaves (op cit), constructivism is discussed as both a theory of mind and a theory of learning, with 'learning constructed in relation to and as a necessary element of the theory of mind that underpins it' (p 10). As such, a researcher's adherence to purist or moderate views on constructivism represent their belief in the existence of a 'reality' beyond language-social construction (moderate-subtle views), or, in more extreme cases, that social subjects, their accounts of their social world, as well as the referents included

in those accounts are socially constructed, and have therefore no reality outside being representations.

In the case of metalearning, whilst sense-making (a subject's way of accessing the social reality of learning in the classroom) is a personal process, the object of sense-making (learning) is conceptualised as a social process, and the sense pupils can make of it as socially mediated. This means that my constructivist take on metalearning suggests that a. pupils do access their social reality, albeit through their personal, limited perspective, and b. I, as a researcher can process their accounts as representative of a reality that can exist beyond those accounts.

What constructionism brings to research is the pervasive emphasis on interpretation, and its relation to making claims to knowledge as truth. Since both participants and researchers interpret, construct and negotiate the meaning of their own actions, those of others, and of social reality, the levels of interpretation make it impossible to claim any such view as a true or certain representation of the truth. Meaning cannot be made outside systems of meaning-making, which implies that ideas, concepts, and past experiences are the ad hoc basis for further meaning making. For research, that means that 'there can be no theory-free observation of knowledge. All research 'occur[s] within our historical, cultural and gendered ways of being' (Blaikie, 2007 p 23), and therefore cannot be viewed but as reflective of the standpoint of the researcher (Denzin and Lincoln, 2000).

A philosophy of intersubjectivity in making meanings is also important for this present research in regard to its relation to conventionalism. Truth as a sum of negotiated meanings is conventional, and agreed upon by communities holding interest to it, at a certain time, in a certain place, and under certain conditions. This view gives rise to situativity, and looking at meanings as products constructed by social actors in bounded systems of constraints and affordances. It seems, therefore, that situating the construct of metalearning and situating conceptualizations of research on metalearning bring together under the same epistemology of constructionism congruent elements of actor-network theory, situative approaches, cognitive constructivism, social constructivism, and symbolic interactionism. While general constructionist research potentially draws from all it theoretical branches, my own research privileges social constructivism due to the value it places on the relation between personal construction of experience and context-mediated meaning ascribed to that experience.

Socio-constructivist research on metalearning can therefore mean an attempt at accessing individuals' personal constructions (products of sense-making) of learning and of effectively applying oneself to learn. The experiences of learning that pupils make sense of in order to construct systems of sense-making are seen as being bounded in a specific time, place, community, culture, and type of communication (ergo, a specific classroom).

C.3 Researcher's Stance

The researcher's stance is closely related to the explanatory grounding of abductive logic, as well as to the ontological and epistemological premises regarding the extent of access to knowledge and the claims that can be made in relation to that knowledge. In my research, I am required to occupy a position of an 'insider-learner' (Blaikie, 2007): insider, due to a need for immersion and use of personal experience for understanding, being accepted into a community and allowing it to influence my views; learner, due to my accessing my research problem through 'set[ting] aside existing knowledge and help[ing] research participants reveal how they conceptualize and understand that part of their social world' (Blaikie, 2007, p. 11).

Abduction values social actors' accounts of their understanding and construction of reality, suggesting a logic of valuing the examination of reality through the eyes of those who experience it, and not through the skewed view of an external, 'objective' researcher. The researcher need therefore immerse herself into the world of her participants and bring as little of her own theoretical preconceptions into reading that world as possible. The bottom-up approach for grounding her explanations of relationships manifesting in the participants' world directs the researcher into deriving theory from real-world situations.

Complementary to this premise is the one found in constructionist epistemology, supporting that additionally to placing the highest value on to social actors' accounts, the researcher needs to accept and make transparent their own preconceptions, thoughts and attitudes to the research being conducted. Such a demand on the researcher is grounded in the view that the researcher herself cannot but experience the social reality of the participants through her own eyes, and therefore through the ideas, constructs, theories that make her who she is, and are usually distinct from those of her participants. I recognize that this is an extremely delicate balance for a researcher to advocate and maintain, and also that some research paradigms (see following section C4) help make the differences between participants' and researchers' views

more transparent. It is therefore my view that research focusing on others' constructions of reality must abide to that simile of being both a mirror and a window: allowing simultaneously a look into a situation, while also reflecting the beholder.

The researcher's role, therefore, is to immerse herself into the social world of the participants, become explicitly informed of their social reality through their accounts of it, and to translate those accounts into social scientific typifications explaining the relationships between elements of such social realities. Constructionist demands are also placed on the boundedness of social actors' and the researchers' produced accounts in terms of situativity (time, location, culture, language, etc).

C.4 Research Paradigms

C4a. Hermeneutics

Hermeneutics is concerned with the study and interpretation of texts. Having evolved from antiquity and re-emerging through efforts towards biblical interpretation in 17th century Germany, hermeneutics came to mean the rational translation of conceptually obscure texts into accessible, logical accounts.

My research is more closely relevant to that branch of Hermeneutics called Contemporary Hermenutics, developed by the philosophical thought of Dilthey and Heiddegger. The biggest transition in Hermeneutics, that from biblical interpretation to understanding expressions of human life and consciousness, can be attributed to Dilthey (1833-1911), who showcased hermeneutics as the method for establishing the human sciences based on the notion of verstehen, or understanding (Blaikie, 2007). A great advancement was made by the realisation that empirical accounts of consciousness produced by means of descriptive psychology had severe limitations, which resulted in Dilthey embracing Husserl's phenomenology. This move produced an emphasis on socially produced systems of meaning, consolidated externalizations of the human mind, namely culture. Understanding then became bounded in culture, and value was placed on lived experience, not mental experience. Residues of our thoughts, or 'objectifications of life' are the constituent parts of a culture, and can be understood through a process of hermeneutic understanding. Such objectifications were no longer restricted to text

form, but included all forms of expression including verbal, artistic, institutional and artefactual. The implication of such a conceptualization for research is that, although access to the artefacts of another culture became much easier conceptually, the possibility remained for the expressions of one social group/culture to be unintelligible to a member of another culture, but for the application of hermeneutics. The move from Classical to Contemporary Hermeneutics was made by Heidegger (1889-1976), who introduced the idea of understanding as being, not just as knowing. In other words, understanding became an ontological privilege rather than an epistemological concern. This meant that research now includes a researcher and a participant, rather than an object to be understood, and understanding means interpreting the fragmented understandings of participants. History and culture, are therefore, in Heidegger's position, viewed from the inside, through a process of interpretation based on presuppositions: all understanding is temporal, bound within a specific social world. 'Objective' knowledge in this view is not also impossible, but also undesirable: reality can only be viewed through the eyes of its participants, and not by a paradoxical, external, objective 'expert'.

The most relevant notion of Hermeneutics to what this research is trying to achieve is that of Giddens' (1984) 'double hermeneutic'. This is rooted in Gadamer's placing understanding (verstehen) not in psychology, but in language. Changing the medium signified a change to research participants being able to access the accounts produced regarding their lives and mental and social constructions. Double hermeneutics therefore is a two-way, dialogic relationship between lay accounts and social scientific accounts. Most importantly, the dialogue in double hermeneutics now serves a purpose transcending understanding. The social sciences are, at this level, inextricably influential to social life by either 'contributing to forms of exploitive domination, or promoting emancipation' (Giddens, 1984, p. 228).

C.4.b Interpretivism

Interpretivism is a research paradigm having originated from Hermeneutics and phenomenology (Blaikie, 2007). Best exemplified by symbolic interactionist approaches, interpretivism posits that individuals are social actors who seek to construct meaning of their actions. Individual meaning is constituted by attempts to interpret, reinterpret, and ultimately reproduce social realities, and ultimately the world. This constant process of interpretation by social actors of other social actors, their actions, as well as social artefacts, is mediated and refined by continuous negotiation of meaning. Voice carries meaning, and it is the

'togetherness' of that voicing process that produces ideas for what is relevant for making sense and continuing to make sense. These attempts at arriving at negotiated meaning are real and they are the world, which reveals the underpinnings of a realist ontology.

The task of the researcher in this tradition is to minimize the distance, or 'objective separateness' (Guba and Lincoln, 1988), between herself and her participants, who construct meaning in particular ways. This distance exists because often the world which the participants of the study occupy, construct, and reproduce exists beyond the researcher's involvement. Researchers, therefore, 'insert themselves into this continual process of meaning construction in order to understand it' (Scott and Morrison, 2005, p. 131). Insertion here constitutes an act of interpreting interpretations. Interpretation is re-describing and reconstructing meaning-making in order to theorize. Engaging in mediation, however, clearly raises issues of adequate representation of social actors' meanings. Interpretivists recognise that the researcher is an artificial, imposed lens on a social group's reality. That artifice becomes apparent in the different language researchers often need to use to systematize and re-describe participants' reality. Quality in applying interpretivism can be likened to interpreting a foreign film: language and text need to be accurately translated as faithfully as possible, and often adapted to serve both original meaning and language of translation. To achieve this congruence, researchers heavily rely on 'the self-reported accounts of lay actors as they engage in various meaning-making activities that constitute their lives' (Scott and Morrison, 2005, p. 132). Applied Interpretivism, in so many words, seeks researcher insertion/immersion in participants' reality and closeness to their experience in order to achieve the collection and interpretation of participants' own accounts of that reality.

Such a defined view of accessing reality cannot but carry several premises, which, depending on field and context, might prove to be either constraints or affordances. Scott and Morrison (2005) list five main premises which delineate the influence of interpretivism on research, which mostly have to do with the limited capacity of interpretivism to 'comprise a full and adequate account of reality and how it can be known' (p 132). Relevant critiques of pure interpretivism also include its inadequacy to account for situations in which social agents either act without understanding how or why they do so, or for situations in which they are communicatively constrained, and therefore unable to express them in an accessible way. All these critiques have been answered differently by different tenets of interpretivism developed in different epistemic fields.

Educational research has been strongly influenced by Interpretivism, particularly in the past 40 years. It has, as indicated above, reciprocally constructed its own view of the paradigm, which treats it as a way of accessing social actors' deliberations and interpretations of their social life, with limited interest for a holistic construction of their entire world (predominantly the domain of phenomenology).

What Contemporary Hermeneutics and Interpretivism mean to my research is that metalearning is a process happening/being constructed in the social system of the school and the classroom outside the sphere of influence or observation of any kind of research. Social actors/pupils and teachers experience, interpret and construct metalearning, and what I as a researcher can do is access that experience in order to interpret it though my own understandings, and ultimately construct an informed, legitimate, representational theory of the relations permeating my participants' experiences. Using verstehen in the form of interpreting makes demands on my being explicit about my own preconceptions which I employ in order to understand, and also on my representing my participants' views into social scientific typifications in the most truthful manner possible.

Part 2- OPERATIONALISATION

D. Designing an empirical enquiry

Having addressed my logical progression of choices from setting a research problem to positioning my stance in the spectrum of research paradigms, I will now move to a more specific articulation of my research, its operationalization. This 'move from the statement of a theoretical proposition to its empirical measurement' (Dowling and Brown, 2010, p 22) is presented as an account of devising a plan for treating research as an act of matching the theoretical premises of the research problem with strategies for understanding and accessing it in the empirical sphere. This endeavour is both convergent and divergent. It is convergent in the sense that occupying a particular position in the spectrum of possible choices for accessing the empirical sphere is a process of distillation and refinement. Reaching, however, such a degree of specificity, automatically creates a need for positioning this theoretical construction on to (existing understandings of) the real world. This process of justifying that positioning is divergent, in that it requires moving in, between, or against perspectives and paradigms to establish its contribution to knowledge production/continuation.

Researching metalearning involves researching pupils' understanding and construction of their own processes of individual and negotiated meaning making. As deliberated in the previous discussion, applying an epistemology (a form of making meaning in order to understand construction and negotiation of meaning) has certain requirements and limitations. In this case, designing a strategic plan for moving into the empirical world became an act which reflected the philosophical underpinnings of the problem and questions. Subsequently necessary consideration was given to the matters of empirical domain, sampling, access strategy, and ethical issues.

D.1 Empirical domain

Having framed the main premises of metalearning, there emerged a need to set my research questions against a specific empirical domain and setting. This choice was particularly significant because the empirical domain and setting also constituted the social and physical environment or context I have been referring to in my questions. Therefore, due to the situative perspective

my research adheres to, selecting the context of research allowed for a degree of a priori knowledge, or knowledge of sensitizing concepts of the affordances and constraints related to metalearning.

This consideration was not unstructured and not without limitations. Situative research could, as I have already stated, be inexhaustible due to the fact that each empirical situation is both unique and of interest as a case pertaining to an overall epistemic regularity or field. However, this is an enquiry situated within social structures, aimed at elucidating how learners construct and negotiate the process of meaning-making. I chose to posit this enquiry within the social practice of formal education, and in particular, within schooling.

There is a need here to make clear my understanding of what schooling can be viewed as when considered as context. Since, in my view, metalearning is idiosyncratic and influenced by the ethos of the school, it is important to locate the levels of context metalearning in the classroom can affect and be affected by. Gurtner, Monnard and Genoud, (2001) build on Bronfenbrenner's (1995) schema and identify levels of context with clarity.

Level of context	Location	Examples
Micro	Lesson or type of work	School subject; type of lesson or learning task
Meso	Classroom or school year	Teacher attitudes; classroom environment; classroom goal structure; classroom norms and practices
Exo	School	Elementary vs. high-school organization and structure; streams or sections; special events
Macro	Outside school	Familial; cultural; economic; political

Table 3. Levels of context and examples of contextual elements at school (Gurtner, Monnard and Genoud, 2001, p. 191)

Although attitudes towards learning, construction of personal epistemologies, and construction of metalearning strategies can happen at all the above levels, my research limited its focus on the ones happening within the school. So my aim became to look for, explore, and explain metalearning as it happens in:

Level of context	Locus	Examples
Micro	Lesson	School subject, type of lesson or work
Meso	Classroom	Teacher attitudes, classroom environment, classroom norms and practices
Exo	School	School organisation and structure, special events

Table 4. Levels of context in formal Education

Macro-contexts were excluded from focus, although certainly not rendered invisible. The influence of the family, culture, society, even the previous educational experiences that have influenced the construction of a learner were expected to always be visible in the way they act. In asking pupils about their metalearning I was also enquiring after those outside school factors they deemed significant enough to recall and attribute metalearning to. However, my primary focus was on the micro- and meso-elements of context: the lesson happening in the classroom.

D2. Sampling

Conducting an investigation into metalearning and the situative parameters that delineate it presents a need for closely examining the empirical domain and the participants through which data will be co-constructed. My interest in Primary Education and above theoretical considerations outweighed in significance empirical findings or considerations of the field (since no empirical research exists on metalearning in classrooms), therefore my sampling was theoretically informed (Dowling and Brown, 2010). My research was done in a Primary school fostering metalearning in a specific, active way, with pupils of a Year 4 classroom.

D2a. The Empirical Setting

'Rosemary' Primary School has seen an unprecedented change in its ethos, pedagogy, reputation and internal structure that have changed its OFSTED rating from 'Special Measures' to 'Outstanding' in just five years. This transformation can be traced to changes implemented by the new Headteacher and her subsequent efforts to modernise practice and efficacy in the school. With a catchment of very low socio-economic status pupils from primarily first generation immigrant families and based in an under-privileged area in south-east London, the

school had long suffered underachievement and stress-induced irritability in both students and staff, according to the Headteacher.

According to both the Head teacher and the teachers, the decision to implement a learning-oriented ethos in the school has resulted in a harder-working, learning-oriented ensemble of teachers and learners. Furthermore, they attribute that success to their implementation of principles (referred to as 'learning attributes' by teachers and learners) of what can be seen as effective learning as standardised practice within the school (self-regulation, perseverance, collaboration, etc.) Starting from as early on as Nursery and throughout Primary school, teachers enrich their practice by using principles that support a consistent view on learning (e.g. puppets for self- and group-regulation, collaborative engagement on tasks, assessment for learning, etc). This particular school constitutes a successful, and encouraging social context, which applies Watkins' (2001) requirements for building learning about learning in a school in a particular way:

a. A process view of learning [the school values formative feedback and a view of learning as growth]
b. Recognition of the need for explicit talk about learning [the existence and implementation of learning attributes in all Years and classrooms]
c. Every day practices in [and of] the classroom (frequent opportunities- metalearning routines) [posters and puppets on learning attributes exist in every classroom, and these principles are also integrated in classroom lessons]
d. Supportive school vision and management [the school's ethos and specific plan for implementation was designed by the school's Head teacher, who supports it school-wide]
e. Resilience to keep at bay the pressures and simplifications [continuous implementation of a specific conceptualisation of learning creates and sustains an ethos particular to this school]

The school's clear and direct vision, which teachers implement in their classrooms proved particularly helpful for my enquiry on metalearning. Having a clear idea of how the classroom conceptualises and presents learning to pupils helped make clear the different ways in which each pupil made sense of a standard, principle-based experience. In other words, knowing the principles integrated into classroom teaching can help understand the type of metalearning the classroom presents and makes available to pupils. In turn, pupils' individual accounts of

metalearning provided insights into how each of them constructs a metalearning strategy as a result of making sense of classroom learning.

Since the primary focus of this empirical project is on (pupils' sense-making of) classroom learning, the choice of a specific case classroom became necessary. The choice of a single classroom (instead of more than one, or even the study of the entire school as a case), allowed for enquiry into a classroom interpretation of school-wide principles, which is the property of a specific learning community. This choice allowed for better conceptual clarity, based on the premise that all pupils experience the same version of learning, and therefore have been making sense of the same unique context.

D2b. Participant Sample

Researching metalearning requires paying special attention to pupils' learning and the sense they make of it. Therefore, firstly, care needed to be taken as to the choice of a group of pupils having representative experience of the ethos particular to the School. Secondly, and most importantly, pupils needed to belong to a group/classroom/Year with a predominant focus on learning. Although the whole ideal goal of education is learning, performance culture evident in Years having to sit Stage or National examinations inevitably skews focus on learning (Amrein and Berliner, 2002). For that reason, Years 1 and 2 were excluded, as well as Years 5 and 6, due to added emphasis on examinations. Between Years 3 and 4, I chose to work with Year 4 pupils, who were likely to have better linguistic skills in regards to communicating their awareness of learning.

My sample consisted of 23 pupils (N=23, 10 boys and 13 girls). Having rather a small sample allowed for dedicating more time to each participant, and for the opportunity to use more than one method for data collection, thus achieving more depth in data collection. Moreover, since metalearning is posited as highly situative, focusing on how the ethos of the school is interpreted, actualized, and how it fosters metalearning in a particular way was very well served by doing research with pupils of a single classroom.

Finally, given that my research topic calls for pupils to think about their own learning and metalearning, which is an endeavour already promoted by the school and is supported by research (e.g. Watkins, 2009), I believe pupils' participation in my research to have suited their

age level of experience and understanding, and to have potentially been beneficial to their further learning journey.

D3. Access strategy: case study

Having discussed my empirical setting (a case classroom), and my sample (Year 4 pupils), I now discuss my specific strategy for accessing metalearning. In accordance to the principles endorsed in my discussion of theoretical approach to enquiry, and to the choice of setting and sample, my access strategy was based on a constructivist, abductive case study. Although most case studies follow a more traditional route (Yin, 2013), my own case study follows Stake's (1995) conceptualisation of case study research, which is particular to qualitative case studies and is favoured in educational research due to its flexibility. According to Stake's (1995) conceptualisation, my case is an 'integrated system' (a classroom in a school), and 'instrumental' (my interest lies in understanding metalearning, not the classroom itself). Moreover, its aim at particularization of the phenomenon of metalearning (as opposed to generalization) is strongly based on interpretation that will preserve the multiple realities of the case (pupils' individual constructions of metalearning). A researcher's direct interpretations and observations aim at highlighting patterns of expected as well as unanticipated/emergent relationships by seeking meanings that emerge from a single instance (pupils' unique personal interpretations of instances of classroom learning/metalearning, which influence their personal constructions).

Understanding metalearning as a personal construction based on sense-making indicates that accessing it means accessing a process that is essentially internal. In accordance with my conceptualisation of qualitative case study, which prioritises researching constructs through the perspectives of those who experience them, I chose to access metalearning through pupils' personal accounts of it. By accounts, I mean personal stories and descriptions of experiences of learning in the classroom, which have been filtered by sense-making, and are products of reflection.

As seen in the segment on learning and awareness (Chapter 3), personal reflective accounts can aim at including two types of awareness: diachronic and synchronic. Pupils were therefore invited to reflect on the sense they had made of their experience of classroom learning thus far, but also on the sense they made presently of specific experiences of classroom learning. I chose to include both diachronic and synchronic reflective accounts in my research in order to acquire

rich descriptions of the sense pupils make of classroom learning and the way in which they use that to strategise for future learning. Moreover, having access to learners' reflections on their sum of past experiences of classroom learning, but also on current, distinct and specific experiences of classroom learning, allowed tracing how pupils' new experiences of learning informed and impacted their existent metalearning knowledge and strategy.

In summary, I chose to research pupils' sense-making of learning in a specific classroom. Research on pupils' personal constructions and ways of constructing metalearning were researched through personal, reflective accounts which focused on a. what pupils know about experiencing learning in the classroom (as an outcome of past sense-making), and b. what sense pupils make of specific learning experiences and how that informs their existent metalearning strategy and how they envisage applying themselves to learning in the future.

E. Research methods/tools

Adhering to a certain methodological framework has had particular implications for the process of choosing particular methods and their use. Methodological tools for accessing pupils' personal metalearning as that happens in the classroom have been theoretically specified as aiming at pupils' rich descriptions of metalearning, in the form of reflective accounts. Moreover, researching metalearning at both diachronic and synchronic level required choosing a methodological tool that could allow participants to reflect on past experiences of metalearning at one instance, and another tool that could allow for reflection on multiple aspects of one, specific experience of metalearning. These choices included in my methodological design led me to choose two main research methods/tools: an initial, semi-structured, conversational interview on diachronic metalearning, and a video-based, stimulated recall interview on synchronic metalearning.

E.1 Initial interview on diachronic metalearning

Providing a platform for pupils to discuss an issue as abstract and alien to their everyday conversational foci as metalearning was a noteworthy challenge. My aim of facilitating pupils to discuss metalearning and provide rich descriptions of it, with potential emergent issues and aspects connected to it led me to choosing informal, conversational, semi-structured interviews as my tool for collecting data. Having some questions was intended to allow pupils to understand my interest in their sense-making of their classroom learning experiences, while the open style of those questions was intended to allow them to steer the conversation towards those aspects of their everyday experience they found conversation-worthy. The use of prompts proved essential in such situations, which arose very frequently, as each pupil was keen to discuss or stress particular aspects of their sense-making and experience.

Regardless of the fact that this was the first empirical project on metalearning in classrooms (to mine and other theorists' knowledge), I chose to structure my interviews by including themes associated with pupils' metalearning in existent literature. Such themed interview routines can be found in Kloosterman's (2014) learning interviews, and in Carnell et al.'s (2000) suggestions for discussing metalearning with learners. My choice to use Carnell et al.'s (op cit) themed-questions was based on their reflecting cognitive, affective, motivational and contextual issues

in a more specific and distinct way than Kloosterman's (op cit) themed-questions. With some adaptations and additions, the interview routine took the following form:

1. Are schools and classrooms places where learning happens? What does the word 'learning' mean to you?

2. What are you trying to achieve by ‘learning’?

3. What is ‘good’ learning?

4. Which is the best way for someone to learn? What steps would you recommend to someone who wants to start learning?

5. What can someone do when they get stuck with their learning?

6. How do you talk yourself through a problem in learning? How might that help you? What does it help you do?

7. Are feelings important for your own learning? Do you feel influenced by them? Do they affect your learning? If so, how?

8. When you are learning, do you choose to work with others, or use things in your classroom to help move your learning forward?

9. Has something happened in your learning journey that made you decide to change how you learn?

In order to facilitate the pupils’ expression of feelings, thoughts and evaluations (Cresswell, 2007), each and every interview was audio-recorded, with the express permission of each participant. As Cresswell (2007) and many other methodologists assert, audio-recording is a valuable alternative to taking notes, as it sustains the conversational flow of an interview by making the participant more comfortable with discussing issues which require focus and the development of personal reasoning in an uninterrupted way.

Nevertheless, doing research in a school dictates respecting their schedule as well as avoiding disrupting the classroom and a pupil's learning by removing them from the classroom for the purpose if interviewing for too long. For that purpose, interviews lasted no longer than 40

minutes, and were done after the express permission of the teacher to remove children from the classroom and into the interview room.

E.2 Stimulated Recall interview on synchronic metalearning

Otherwise known as 'confronting interviews' (Lemos, 2001), stimulated recall interviews (SRIs) are a methodological procedure or tool which involves using video-recordings to elicit context-specific accounts from participants. This increasingly popular tool is gaining ground especially in studies of everyday experience with young participants (Meier and Vogt, 2015; Ahmed, van der Werf, and Minnaert, 2015; Cutter-Mackenzie, Edwards and Quinton, 2015), and is based on the finding that 'when given an opportunity to view and talk about what they had done in intervention sessions, children [...] were able to demonstrate greater metacognitive awareness than they had during the lessons' (Juliebo, 1998, p 31).

Facilitating memory is strongly linked to facilitating reflection, which is the ultimate goal of this research. Allowing pupils to reflect on specific learning experiences by providing a form of access to that experience once more through the medium of video, can facilitate reflection and the production of accounts that are richer in detail and nuance. Since these interviews aim at enquiring into pupils' synchronic metalearning (making sense of multiple aspects of a single experience), providing pupils with a way of refreshing their memory of specific incidents and by asking them to reflect to reconstruct these incidents, is likely to result in rich and specific descriptions.

This process of viewing, reflecting, and commenting constitutes a reflective discussion between researcher and pupils, with the use of visual (video) and verbal (interviewer question) probes and prompts encouraging pupils to discuss their metalearning (awareness, attitudes, strategies), and to identify which aspects of their experience they highlight as meaningful and significant, as well as what insights they derive from those to use in future learning. Indeed, pupils expressed finding the memory-aid of the video really useful, but also enjoyable, which prompted them to reflect on their learning experience and to discuss it more eagerly and extensively.

Another choice made was to not use the video-recordings themselves as a unit of analysis or data-set, but rather to rely on pupils' reflective accounts that were based on those recordings. This decision was made with the purpose of excluding any notions of objectivity the element of

researcher observation would bring to this research. Since this is not a behavioural study, but rather one on internal life and reasoning, I chose to focus only on those aspects of their experience pupils deem significant enough to include in their reflective accounts.

As with the initial, semi-structured interviews, attention to being as little disruptive to classroom and pupils' learning as possible limited the duration of each interview to 30-40 minutes approximately, depending on the richness of pupils' comments and their conversational pace. These interviews were also audio-recorded, with the purpose of facilitating pupils' uninterrupted expression.

My conceptualisation of 'specific learning experience' was translated into a choice of focusing the SRIs around lessons of Literacy and Mathematics, because they are the two core subjects consistently shaping learner experience from Year 1 and onwards. They are also the two subjects taught every day of the week, and therefore the most likely to provide the backdrop for pupils to construct regularities in their making sense of and directing their experience of learning (metalearning). A more specific description of how video data was collected is included in the following segment on data collection.

E.3 Interview with teacher for clarifications on classroom learning

This last data collection tool was selected as a safety measure for ensuring my accurate understanding of pupils' own understanding of classroom learning. Although triangulation for objectivity was not a main issue in this research, I deemed it useful to have the teacher's own perspective on the routines and the structure of classroom learning. Accessing her perspective on the physical and social environment of learning allowed for better understanding of what pupils are invited to experience and make sense of, in order to metalearn.

A short interview with the teacher followed the analysis of pupils' accounts of experiencing learning in classrooms, and was focused at gaining understanding of teaching practices and classroom experiences which pupils described either in fragmented or conflicting ways. Additionally, comments were sought on how learning in the Year 4 classroom is structured and presented to pupils, as well as information on what sense she intends learning in the classroom to have, and how she intends to achieve it.

Although little ambivalence on the classroom experience of learning remained after the analysis of pupils' initial interviews and SRIs, having the teacher's own description of classroom learning was valuable for understanding how and for which aspects pupils' sense-making converge with that of the teacher.

F. Ethical issues

Constructing a research design is an act of epistemology in itself, and includes consideration of limitations to producing knowledge as well as towards participants' contribution to knowledge. Choosing to make a sequence of choices including selecting qualitative research, abduction, constructionism, hermeneutics and interpretivism signifies placing high value to participants' lived and mental experience of their realities, and an attempt towards solving my research problem by entering their social reality through their guidance, as their inductee. Discussed in my segments on Explanatory Grounding and Hermeneutics, my intent throughout is one of respecting and representing with fidelity the realities my participants construct and experience, with the political intent of providing them a voice in social scientific consideration, and promoting their experience as worthy of attention. This research stance also denotes my ethical attitude towards participants as one of respect, and one of reciprocal benefaction, since information and knowledge communicated in either direction can benefit in self-knowledge and development through reflection. Lastly, since research itself is not a neutral tool in search of a truth but a political one, as Schostak and Schostak (2007) assert, I have chosen for my own research to depart from more traditionalist, 'teaching for metalearning' foci, and strongly rely on the lived experience of the pupils, in order to empower them and to showcase their voice.

This research, both in its theoretical design and fieldwork has a strong adherence to the BSA ethical guidelines (2002), whereby researchers

> have a responsibility to ensure that the physical, social and psychological well-being of research participants is not adversely affected by the research. They should strive to protect the rights of those they study, their interests, sensitivities and privacy, while recognizing the difficulty of balancing potentially conflicting interests.

Although this research was strongly based on pupils' participation and view, it did not raise any strong ethical issues, as it did not delve into very private or ethically ambivalent aspects of

pupils' private lives. In the unlikely case in which pupils felt inclined to discuss sensitive matters, my responsibility as a researcher was to stop or move to another question and therefore protect the interviewee. If there had been a revelation of a safeguarding issue, I would have reported this to the school authorities. Thankfully, no such incident happened during any interviews.

Ethical issues pertaining to my accessing the empirical domain involved seeking the consent of gatekeepers (Headteacher, teacher), guardians (parents and adults in loco parentis), and the participants themselves. My doing research in the school was secured through initial meetings with the teacher and Headteacher in which the objective and procedures used in my research were thoroughly explained, and a DBS (Disclosure and Barring service) check was submitted. Opt-in type consent forms were then sent to all pupils' parents informing them of my identity as a researcher, the goals of my research and the methods I would be using, and asking for their signed permission. In that same form, consent was also sought for the interviews to be recorded, and assurances were made in the matter of disclosure and confidentiality.

Having gained the consent of parents/guardians, consent was also sought from each individual pupil before each interview they participated in, and assurances were given as to how their interview would be used, their anonymity, as well as their right to withdraw at any point should they wish to (BERA, 2011; Dowling and Brown, 2010). Additional measures for ensuring pupils' genuine consent to participate or withdraw from this research at any moment they wished to do so included seeking consent on the timing of the interview (day, time and place),and asking for alternative arrangements that the interviewee might prefer, which included not doing the interview at all and withdrawing from the research, or postponing the interview for a different day. Lastly, pupils were told at the beginning of each interview (both thematic and SRI) that they were free to ask for a break or for a termination of the interview should they wish to, or if they felt uncomfortable discussing issues that were sensitive to them. In such cases, they would return to their classroom and continue their lessons as usual. During the course of data collection no pupil availed themselves of such opportunities to withdraw from research or to postpone interviews; as a group, pupils demonstrated enthusiasm at being interviewed on their learning, to the extent of recommending it to other pupils (non-participants and pupils of other classrooms), or even asking for more interviews on their learning.

Cohen, Manion and Morrison (2011) identify two more areas of ethical concern in interviews: informed consent, and consequences of the interviews (p. 442). Care was taken in my process of

theoretical sampling to select an age group (school Year) in which pupils would find it useful and easy to participate in research, and would easily understand the demands and processes involved (e.g. sitting through interviews). Moreover, as already stated, pupils' participation in this study is expected to be conducive to augmented awareness about learning, theoretically shown to help them learn more effectively (Watkins, 2001, 2010). Lastly, participant pupils were allowed to express themselves freely during data collection, as they were interviewed individually, without supervision by any teacher or school staff which might have led them to construct their accounts differently. This same right to free expression was secured by assuring participants that their interview statements would be used and presented to others after being anonymised, as they are in this thesis.

G. Data collection

Following my design, selection of tools, and ethically-controlled process of gaining access to my research setting and sample, I will now discuss the process of data collection. This six-month long process consisted of three stages: initial interviews (3 months), SRIs (3 months), and a teacher interview (single instance). Each stage included data collection and transcription of audio data, with data collected at each stage informing further stages.

The following table depicts the foci (research focus and research sample), methods or tools for addressing each focus, and the aims of each method or tool.

Focus	Method	Aim
1.Diachronic metalearning (PUPILS)	Interviews (audio recorded) Conversational, semi-structured interviews with pupils based on theory-derived themes.	Construction of reflective accounts on the compiled sense pupils have made of experiencing learning in the classroom thus far, the sense they have made of their own learning, their use of sense making to direct and guide future learning, and the influence of the social and physical environment of the classroom on their making sense of their experience of learning.
2.Synchronic metalearning (PUPILS)	Stimulated Recall Interviews (audio recorded) Unstructured reflection supported by video-recordings of pupils doing Literacy and Numeracy tasks, and interviewer prompts.	Construction of reflective accounts on the sense pupils make of recent learning experiences (tasks) in Literacy and Mathematics, and on those aspects of their experience pupils highlight as important for their metalearning.
3.Experience of learning in the classroom (TEACHER)	Interview (audio recorded)	Teacher comments on pupils' descriptions of classroom learning, clarifications, description of the experience of classroom learning, perspectives on the sense she intends pupils to make of classroom learning.

Table 5. Foci, methods and aims of data collection

Further details on the process of data collection include the timeframe of each and all stages, and the choices and procedures involved in each stage of the stages described next.

Stage 1: Initial interviews with pupils on diachronic metalearning (3 months: end of September - December)

These interviews presented a technical complication related to permissions to interview pupils individually. I deemed it more feasible to obtain permission to interview pupils in pairs, until I had gained theirs, and school leadership's trust. Each interview (11 interviews plus one with a single pupil at the end, 12 in total) had an approximate duration of 40 minutes, and followed the theoretically informed interview routine. In those cases in which pupils' answers covered another question or theme, asking that question was foregone. Pupils were very keen to discuss their learning and their understanding and interpretation of classroom learning, which, as a few of them stated, pupils are never asked to do in classrooms. They were also very keen to discuss and debate ideas between them, which provided me with valuable insights into their views as well as into classroom events.

Each interview was transcribed the same day, all interviews were loaded onto NVivo, and codes were ascribed to data through 'inductive incident-to-incident coding' (Charmaz, 2006) in order to facilitate quick search-through data in further analysis. Each pupil's responses were filed separately, and constituted a separate account. This process of coding and analysing had a double aim: firstly, to detect issues of primary concern to pupils to further explore in subsequent phases of data collection, and secondly to set the foundations for further data analysis by creating a distinct dataset on diachronic metalearning.

A chance was provided to all participants to validate that the views they had stated in these interviews were valid (their own opposed to their partner's / superficial agreement with a strong-minded partner, etc) as an introduction to the following stage of SRIs.

Stage 2: Stimulated Recall Interviews with pupils on synchronic metalearning (3 months: January-March)

Video recordings and SRIs on Literacy and Numeracy were done on the same day. That decision was informed by my aim of accessing synchronic metalearning through learners' accounts of

experiencing specific learning tasks. In the case of synchronous metalearning, accounts include the range of the aspects of their experience pupils made sense of in order to complete their tasks and to learn about learning.

Each SRI is a two-step process that includes video-recording and video-projection/reflection/interviewing.

Step 1: Video-recording pupils learning in classroom (Literacy and Mathematics).

A decision needed to be made on what aspect of Literacy and Mathematics to observe and record, and for how long. This was necessary in order to create and follow a standardised routine which would allow all sample pupils to reflect on their learning in the same way.
Since all learning is different due to subject and content taught, I chose to observe and record those activities aiming at 'extending and consolidating learning' (named as such in teachers' plans). I chose to only observe those 'extending and consolidating' activities done individually, in order to keep each pupil's metalearning account distinct to those of others and allow them personal reflection. With such activities ranging in duration from 7 to 40 minutes, I decided to observe and record 5 minutes of an extending and consolidating task in each subject (Literacy and Mathematics) for each pupil, as seen below:

Subject	Type of task	Duration of task	Type of work
Literacy	Extending and consolidating task	5 mins	Individual work
Numeracy	Extending and consolidating task	5 mins	Individual work

Table 6. SRI- Video recording routine

These limitations resulted in major delays, due to the fact that it was highly likely that only one subject would be taught in one day, or other types of tasks other than 'extending and consolidating' could be set, or tasks would be approached collaboratively. In all such occasions, data would be unsuitable, and data collection was further postponed. In order to minimize time losses, I collected data on two pupils each day on which data collection was possible.

Step 2: Stimulated recall interview with one pupil on their experience of learning in Literacy and Numeracy

Before starting the stimulated recall interview, I reviewed the initial interviews with each pupil. This involved re-reading the text, and allowing them to either expand on their previously stated views, or review them, with an aim of making the content representative of their experience and sense-making. This process had a duration of approximately 10 minutes.

Stimulated recall interviews were done directly after having reviewed initial interviews, which had an added effect of reminding pupils of their previous statements and general attitudes towards learning. In SRIs, the video recording of their Literacy lesson was played to the students, and an audio recorder was handed to them. They were asked to watch the video carefully and attempt to remember what it was like being in the classroom and re-experience learning 'in the moment'. This prompt was used to instigate reflection on their part through reassembling and giving meaning to the situation they were now confronted with. If asked, I paused the video at specific moments, or re-wound it to allow pupils to focus on those aspects that they wished to. The same process was followed for videos on Mathematics.

Probes were used to guide further discussion and reflection, all aiming at elucidating the pupils' processes of sense-making and particular rationales for making sense of their experience in their particular way. Probes and prompts included questions on: describing the situation, previous knowledge on how to learn, feelings, making use of the physical and social environment of the classroom, what they learned about learning and how they can improve learning in their future.

Each SRI (Literacy and Mathematics) had an approximate duration of 45 minutes. 46 SRIs were conducted in total (2x23).

Stage 3: Interview with the teacher

After analysing pupils' accounts of metalearning, I conducted a brief interview with the classroom teacher in which I sought comments on pupils' understandings of what learning in their classroom means. More specifically, specific (anonymised) descriptions of classroom learning and practices described in pupils' accounts were sought, especially in cases where pupils' descriptions were fragmented or conflicting. Additionally, the teacher was asked to

describe what sense she expects pupils to make of learning in the classroom, and how she designs or adapts her teaching to achieve that. Lastly, mention was made of those school-wide practices that the teacher believes are conducive to pupils' effective learning and sense-making of classroom and general experiences of learning.

Although conducive to my own understanding, no extended excerpts and quotes from this interview are included in my presentation of results, because the main emphasis lies with pupils' perspective and my own understanding and presentation of them.

H. Analysis

Analysis was an ongoing process, concurrent with that of data collection. As in all research aiming at extending theory and highlighting emergence (Dowling and Brown, 2010; Charmaz, 2006; Dubois and Gadde, 2002; Timmermans and Tavory, 2012, etc.) each stage of data collection guides and informs all following ones. The aim of my research guided my overall analysis, which was to understand how pupils learn about learning from making sense of their classroom learning experiences and what the extent is of the influence of the classroom on the process and outcomes of pupils' sense making.

At the first stage, the dataset on diachronic metalearning was thematically analysed (inductive thematic analysis) following Brown and Clarke's (2006) method of coding statements and grouping codes into themes. This process was partly done on NVivo and partly by hand. Following pupils' reviews of the content of their initial interviews (as an introduction to doing SRIs), codes and themes were revisited to accommodate these (admittedly minute) changes.

The second dataset on synchronic metalearning was also thematically analysed (inductive thematic analysis). Coding of statements on NVivo and by hand was followed by grouping of codes and development into themes.

Although coding on NVivo was valuable for facilitating quick access to data-statements and for storing data in a systematic and safe manner, most of the process of thematic analysis was done conceptually and by hand, since it required an imaginative review and synthesis of data, codes and categories that no qualitative analysis package can offer to inductive analysts at this point in time. As familiar as a social scientist might be with inductive analysis of qualitative data, the

sheer bulk of 46 extensive texts constitutes a considerable challenge, especially when faced with a complete absence of supporting software. Drawing from my experience with inductive analysis in grounded research (Mylona, 2012), I decided to a. analyse datasets separately and do overall analysis later on, and b. print all transcripts on the left half side of landscape A3 paper sheets, put them up a wall side by side (1 interview-1 row of A3 sheets), and carefully read and compare points inside the same interview, as well as between different interviews. I highlighted similar points with coloured pens, and wrote a category code next to both similar quotes or extensive excerpts. I followed this process for half of my transcripts (half of each dataset, 16 interviews), and then searched for the same categories in each of the rest of the transcripts (saturation, in grounded theory terms). Any new categories that emerged in the second half (17) of transcripts was also searched for in the first 16. When saturation of categories was achieved (I could find no new codes), I listed all categories and grouped them into themes. This process required special attention in instances where a code/category fitted under two themes, in which case either revisiting the data was necessary to finalise the theme in which the code should belong, or, should the code be equally important for both themes, notes were made on the role the same code had in different themes. The same process of inductive analysis was followed for both datasets (thematic interviews and SRIs) separately. Joint inductive thematic analysis was done partly during writing results Chapters 5 and 6, and partly before and during writing Chapter 7, Discussion on results. Joint analysis included careful consideration of all themes presented across datasets, and an interpretive synthesis of results in relation to existing metalearning theory, and my own original framework; specifically, this final stage of analysis distinguished between themes already included in existing metalearning theory, themes which move beyond past theory and are more congruent with my own framework, as well as emergent themes which can inform future directions into researching and theorising metalearning.

Before proceeding with presenting the outcome of my analysis, I will reiterate the aims which guided it. My analysis aimed at showcasing how pupils make sense of their classroom learning, both individually, and as a collective community. This means that I perceive metalearning to be personal and idiosyncratic, but as also the property of the community constituting a specific classroom. My aim is to highlight collective and personal sense-making, and to underscore the influence of the social and physical environment of the classroom on pupils' metalearning.

An additional aim is to gain understanding into how pupils learn about learning by making sense of their experiences. New and specific experiences (synchronic metalearning) have the potential

to alert pupils to new or different ways of making sense of their overall metalearning (diachronic metalearning.) One last aim is to establish if and how metalearning supports pupils' learning in the present, as well as their strategising for future learning.

Chapter 5: RESULTS ON DIACHRONIC METALEARNING

A. THE CLASSROOM [Learning about what schooling intends my learning to be like]

This section is a mediated representation of pupils' views on what they perceive learning is meant to be like in the classroom. I will hereby thematically represent pupils' views, with an aim of 'help[ing] research participants reveal how they conceptualize and understand that part of their social world' (Blaikie, 2007, p 11).

Pupils' views and understanding of how their classroom (social and physical context) intends their learning to be experienced will be used hereby to address my main Research Question:

> How do pupils construct/activate/ experience metalearning as it occurs in specific learning environments?

I do this by reconstructing, through pupils' descriptions, the 'specific learning environment' of their classroom. In no way does this mean that this section constitutes an objective description of how the classroom operates and how learning is provided in its context. It is, however, a true description, in the sense that it is a representation of pupils' collective sense-making of their experience of learning in the classroom; it is true in the extent that all collective subjectivities with reference to the same context are true.

This section also addresses all three research sub-questions in specific ways:

- RQ1a: What accounts do pupils construct of their metalearning as it happens in the context of their classroom? Accounts of the process of making sense of the experience of learning (metalearning) are locally and temporally bounded. This section is pupils' description of that boundedness.
- RQ1b: Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do? This section contains pupils' accounts of characteristics and

regularities that emerge in the classroom, which pupils try to make sense of and metalearn.

- RQ2: Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning? In this section, pupils describe which aspects of the physical and social context of the classroom are used in order to convey a particular sense of learning to them.

Introduction: Classroom, the space of learning.

In a research like this, with a focused interest in how children learn about learning in the classroom, investigation starts at the very threshold of the empirical setting. Before entering a classroom and delving into the particulars, it is crucial for both the researcher and their research interest to undergo a rite of acceptance by participants. The main issue is this: Do pupils endorse the view that learning happens in the classroom? A negative answer to this very initial question would steer my research into the field of studies on belonging, or perhaps resistance to enculturation.

Fortunately, and perhaps somewhat surprisingly, pupils seemed to not only endorse the view that learning does happen in the classroom, but to also have constructed rationalisations around why that happens.

> P.M.: I was told that schools and classrooms are the place where learning happens. Is that right?
> Rhonda: Yes.
> P.M.: Really?
> Rhonda: Yes, because when you do learning, it should be quiet and peaceful.

These insights/rationalisations pupils provided seem to be the product of thinking about the ways in which the classroom fosters their being learners. Pupils seem to know about how they learn and the requirements they have in relation to that, and to juxtapose those with what the classroom affords them to satisfy those requirements.

This juxtaposition is informed by knowledge of contexts of learning derived from previous, alternative experiences of learning. Pupils address how this classroom fosters their learning in comparison to other classrooms in other countries, as illustrated by Connie and Hani:

> Connie: Learning makes me happy because when I go to my table I feel happy, because I remind myself in my head 'some children don't have this chance, and you have this chance, and you should be happy about that'. So I think about that and I'm happy after.

Hani: It's an amazing experience for all the children...?

P.M.: How come it's amazing?

Hani: Because you're learning. You get that opportunity. Because some people don't have a chance to learn.

They compare other schools, other classrooms in this school, or even to how their home fosters their learning:

Connie: If you feel one day 'oh, school is boring, I'm not going today' then you'd rather be at school learning rather than being at home. Because I don't think I enjoy so much stuff at home, because your mum needs to cook and you just wait until she's finished. In school you can learn instead of just waiting.

This comparison indicates some attention, on their part, to how different learning environments foster their understanding and experience of learning. Pupils with more varied experience in different contexts like Hani and Connie seem to have developed stronger sensitivity to what learning in the classroom means to them, in comparison to other pupils whose range of experience is limited to different classrooms in the same school and as a result pay little attention to differentiating between contexts.

Overall, pupils confirmed that this classroom is a space for learning to them at the very outset of this investigation with various degrees of enthusiasm. Their stance allowed for continuing on to understanding why this classroom concords with their personal views of what learning means and how it happens.

A.1 Description

Describing the context and the form of a social activity exceeds by far a process of referencing organisational criteria in interpretative studies, meaning that experience of a context is a far richer source of information than the rules or intentions constituting the context. Instead, descriptions are based on participants' perceptions of the norms delineating a collectively performed activity. Participants' descriptions are not expected to be identical, but rather to constitute a spectrum of views and perceptions (Marton and Booth, 1997).

Presenting a spectrum of views usually entails identifying outliers and the most commonly held or popular views. In this research, my choice for faithfully representing participants' descriptions is twofold: firstly, identifying which aspects of experience most participants view as definitive of learning in the classroom, in order to reconstruct 'the scene', the organisational blueprint of learning; and secondly, examining how participants discuss those aspects in order to understand whether they view them as affordances or constraints to their personal learning.

It is valuable to stress here that my decision to 'faithfully represent participant views' means reproducing and commenting on pupils' value judgements on how learning happens in the classroom. A necessary stress on the subjectivity of pupils' views further reinforces the supposition that pupils' views, attitudes and statements are understood here as products of pupils' pre-conducted sense-making.

Description seen as the product of pupils' past sense-making is exactly congruent with the concept of 'diachronic metalearning'. Descriptions therefore can be viewed as a condensed imprint of past metalearning cycles-rationalisations: 'What do I know about what learning in the classroom is meant to be like?'

Pupils discuss what the classroom intends learning to be by underscoring the following: learning in the classroom is a routine with specific steps, learning from mistakes is the starting point of a second attempt towards learning, and feedback in the classroom is important for understanding and making decisions.

A.1.1 Learning in the classroom as a routine with specific steps

Patterns and sequences

Pupils describe experiencing learning in the classroom as routine sequences of events with a routine range of tasks entailed in each event. Routines of 'listening to teacher-comprehending/thinking, writing and checking' were included:

Event	Task - Mode
Listening to teacher	On the carpet At tables
Thinking	Independently Collaboratively
Writing	Copying from the whiteboard Applying methods Completing exercises
Checking	By themselves Comparison with previous feedback Showing to teacher

Table 7. Patterns and sequences of classroom learning

Recurrent and emphatic references to routines and/or actions directly linked to specific routines indicate that the experience of learning in this classroom is fairly standardised in format. Nevertheless, this description of experience is in no way unique to this classroom, since it is a default characteristic of formalised education to rely on structures, and it can be expected for all classrooms to operate through routines. The extent to which this classroom is perceived to adhere to structural rigidity, however, is a defining feature in the pupils' descriptions. Iris and Nasatya's comments illustrate this:

Iris: [...] focusing on what you have to do. And you can understand the task, and you have to comprehend it.

P.M.: And then what do you have to do?

Iris: Listen

P.M.: Ok, listen, comprehend?

Nasatya: You have to

Iris: write it

P.M.: and then?

Nasatya: check it

Iris: You have to check it because after you've written everything you can't just say 'I'm done', you have to reflect on your learning.

Within this experience of process, pupils distinguish two forms of standardisation: Procedural (sequence of routines) and cultural. Cultural standardization is experienced through endorsement and implementation of the learning attributes supported by the School's ethos. In their interviews and comments pupils consistently pair routine actions with specific attributes, and indicate that the culture of the classroom is one of close observance of the attributes in all aspects of classroom and school life. Standardised routines in provision are therefore experienced concurrently with standardised rites in culture. Routine is here being interpreted as a sequence of actions (e.g. sitting on the carpet and facing the board), while rite is interpreted as the sum of meanings a routine holds (e.g. sitting on the carpet, which is a routine, needs to be done in a specific way which entails being attentive, being accommodating to peers, and generally entailing specific expectations as to conduct and mindset).

Although the degree to which pupils identify with classroom routines and rites varies, all pupils discuss their experience as consistent in structure and culture. The most pervasive of routines and rites were those associated with the social configuration of learning (attributes: collaboration and independence) and of the concept-attribute of challenge.

Collaborative and individual learning

Learning tasks are completed individually, in partners, and in groups. Although pupils have no say in the configuration in which they complete their learning tasks, they seem to have a detailed understanding of how collaboration and individual work are to be understood and effectuated in the classroom. Part of that understanding is that the implementation of the classroom's learning attributes should be fulfilled regardless of the mode in which they have to work.

Advancing and furthering knowledge through challenges

Pupils suggest that the standard procedure through which new or more complex knowledge is provided to them is through challenges. One of the leading and most referenced learning attributes, challenge, is provided through tasks of increasing complexity, and the expansion of knowledge can effectuate anything from a better grasp of a method, to the introduction of new relevant concepts. For example, Connie explained:

> Connie: And when I was doing my maths I was doing the number line method, and then I'd done all my number line method good, and then I'd done it in my head so I said 'today I'm going to do maths and I can do it', so I'm going to put my best effort inside it, and then I'd done it. So I did all of those.
>
> P.M.: So you said that in order to learn you want to do a different method?
>
> Connie: Yes because first I was on step one, which was my number line method, and then when I did all my number line method Miss T wrote in my numeracy book 'you have done it good lesson and you've put your effort into it, you're ready for the next step'.

Additionally, challenge is also discussed as an attitude the learners themselves need to endorse and direct themselves towards, in order to achieve improving their knowledge and learning. Madison exemplifies that stance:

> Madison: If you practice the same thing every day, you won't learn that much. Because if you're practising the number line method every single day, you'll get better at the number line method, but you should reflect and challenge yourself on another method and practise it until you get it, and you can do it in your head.

Challenge is therefore associated with a. challenging tasks which the teacher introduces, and b. pupils' own choice to engage in more complex methods and tasks. In the first case, pupils do not express having any control over when the teacher administers challenges. In the second case, however, pupils discuss that it is a norm in the classroom to consider confidence to be an indicator of being able to progress onto challenges. It is an assumption that this is also the rationale the teacher follows to choose when to provide them with challenging tasks. David emphasised this:

David: Put it [learning] in steps. First do one thing and then do everything in one [*unclear*] just thinking that they won't get it all very quick. Think about, help them with their learning with the first part, then move to the second section when they feel like they're confident.

The teacher's central role in providing and/or encouraging pupils' initiative for challenge is underscored by pupils, who feel that having the teacher's confirmation, if not their direct instruction, helps them handle challenging situations. As Madison and Lenora explained:

Madison: You can ask the teacher if you can move on to the next method, and she might say yes.

Lenora: Um, it's sometimes a bit tricky for me, and then I become confident on it. Because now Miss T has said I have become confident on my number line method, so now I moved into another method, which is the grid method. And I find it a bit tricky.

Interestingly, although pupils seem to refer to feeling competent, they use the word confidence to also refer to their ability to demonstrate their competence. This linguistic manoeuvre can be directly attributed to the teacher:

P.M.: It's interesting, this idea of confidence. Where does it come from? Is it your idea or a school concept?

Teacher: To be honest, it's a bad way to say it. When saying less confident... I don't know how to word it. Maybe low achievers? The word confident is more delicate. Gerry is confident, but he's in my less achieving. That's why I got it like that in my mind. Not that these children are any less confident. Some of them, like Elizabeth, she's very timid. But she's in my most confident group. So maybe the most confident in their learning. Most able. So the succeeding group. Exceeding expectations, meeting them, and below, or something like that?

A.1.2 Learning from mistakes

Most pupils discussed the stress placed upon the value of mistakes for learning, a norm they regard as very supportive to their learning. In fact, the connection between making mistakes and learning is so strong, that some pupils verge on associating making mistakes to learning itself. For example, Iris claimed:

> Iris: By saying 'I can do this and I will do this, even if I get this wrong I'm learning something because we can learn from our mistakes' [...] If I get it wrong, I do care, but I'm like 'it's ok, I've just started', it's sometimes good to make mistakes, that's when your mind is learning'

It seems however, that the dominant culture of the classroom is one in which mistakes are viewed as a prompt for more attention to one's own learning, rather than to be considered to be guiding the process of learning. Kena commented:

> Kena: [...] sometimes, if they get it wrong, that's learning as well. Because if you get everything right, then it wouldn't mean you're learning anything. [...] And even if you're wrong, you'll be learning and then getting an answer for yourself but with a lot of help.

A.1.3 Feedback

Locating and understanding mistakes is, however, dependent on the teacher highlighting those mistakes and providing formative feedback. Learning from mistakes seems to be initiated by the teacher, whose feedback alerts pupils to the existence of mistakes and provides examples of the correct application of methods.

However, it is the responsibility of pupils to have carefully perused their work, and only then ask for feedback from the teacher, as Jenifer describes:

> Connie: I go back to the start and then I look at it. If I've made some mistakes. Because sometimes you get a little bit mistakes or you miss out the wrong answer or the units that you have in your number sentence. And when I think it's right, I give it

to my teacher and the teacher writes 'you need to check that' and then I check it and then I know I can't do that next time because it's wrong.

Summative feedback is often provided at the end of task completion, and is in the form of verbal affirmation or encouragement for looking more carefully into why the applied method does not yield the desired outcomes.

Formative feedback is provided through 'green bubbles' (green pen-drawn speech bubbles containing corrections and formative feedback on specific mistakes) which the pupils consult at the end of the lesson, or at some point during the same lesson. Green bubbles are given on the pupils' books, and are available to each and every student after almost each learning task to facilitate thinking and learning from mistakes. Pupils receive this feedback with varied degrees of enthusiasm, because it adds to their workload. For example, Connie explained:

Connie: Hm. And also some children, when they do the wrong answer, sometimes Miss doesn't put it in a green bubble, just does a little circle on the number that is wrong and then she says a comment under there. But some children say 'it's not a green bubble, I can miss it out' and go on the next one.

A.1.4 classroom goals

A recurring understanding of learning in the classroom seems to be about its outcomes. Pupils consistently refer to there being a single, unique answer which they need to reach/find/achieve. This feature of learning in the classroom is identifiable to pupils' consistent references to the answer, independently of subject or task demands. Learning in the classroom therefore becomes manifest through unique-solution type answers to tasks. For example, Arnie says:

Arnie: If you're doing maths or literacy you have to work hard to get the answer.

A.2 Affordances and constraints

Pupils discuss their understanding of the operational norms of the classroom through statements often beginning with 'I/we should' or 'I/we have to'. Such statements are often the response to questions posed to the pupils predominantly by themselves. Classroom norms seem to be regarded as the starting point of generating descriptions, or as the concluding justification for what happens in the classroom.

Invocations of classroom norms indicate that pupils structure their descriptions through a process of signposting, predominantly shaped through outliers. That is to say that pupils describe the collective experience of learning in the classroom by highlighting what they can and cannot do as a collective entity. What they can and cannot do seems to shape pupils' descriptions to reflect that learning in the classroom is viewed as a process of juxtaposition. Although both what they can and what they cannot do is imbued by classroom norms and rules, pupils describe the classroom as a social space which they experience through attitudes of both autonomy and compliance.

Juxtaposing experiences of autonomy and compliance is not tantamount to generating dichotomies. Pupils' understanding of the classroom as a space with its own rules to which they have to adjust generates a range of descriptions of autonomy and constraint, and the outlier (most extreme) attitudes and experiences pupils feel they are allowed to have toward them. While some pupils regard classroom practices as a framework or a context to work within in order to achieve learning, others feel that absolute observance of classroom rules and regulations are tantamount to learning. This 'routine vs. ritual' view seems to indicate a variation in the perception and description of autonomy and compliance, and the significance each has for pupils' experience.

Nevertheless, pupils have a common, unspoken agreement on the limits of their autonomy, which is evident in their descriptions of the procedure of learning in the classroom.

A.2.1 Following processes

An important constraint or 'rule' of the classroom is engendered through the emphasis placed on applying and/or implementing the learning attributes. Pupils rarely discuss process without

references to the added value of these attributes. Implementing attributes in a structured and timely manner constitutes the idea of 'good' learning in the classroom. Although learning and good learning are both experienced as processes enriched with the implementation of learning attributes, good learning is described as a process in which the learning attributes are implemented in a qualitatively better way than with just learning. The pupils explain:

P.M.: Now that we've kind of thought about what learning is, can you tell me what good learning is?

Hani: Good behaviour, good focus, good effort, and that's good learning [...] So, like targets that you have to do.

Connie: Good learning is like when you're going to be sitting down and listening and challenging yourself and never giving up and ... don't distract other people next to you, just write about your own work and just concentrate.

Madison: Good learning is trying your best, don't give up, don't distract people next to you, concentrate on your learning, and... challenging yourself.

P.M.: So what do you think is the best learning you've ever done? Is there any learning you've done you've been proud of?

Connie: In Maths. Because I challenged myself and focused and we were doing word problems, and I was doing green ones and then yellow and then orange ones. So I was really trying, challenging myself and focusing.

Lenora: Um... you look back really hard in your learning and see if you've made any misconceptions, and if you have, you can just correct them. And them all the time you will know how you need to keep on checking your work for misconceptions.

However, applying attributes is not completely open to interpretation, and pupils are further constrained by particular meanings given to each attribute in the classroom. This context-specific operationalization of the attributes is evident in pupils' views through mantras often phrased as 'should' or 'have to' statements. 'Try your best', 'don't give up', 'work hard', 'challenge yourself', and 'achieve your target' are some of the more comprehensible, colloquial reminders for the attributes 'focus', 'perseverance', etc. Rhonda and Arnie discuss:

P.M.: What is the best way for someone to learn?

Arnie: You have to focus.

P.M.: So if I brought to you a child who had never learnt before in their life, and they asked you 'what do you do to learn'? What steps do you have to take? You said focus..

Arnie: Yes...

Rhonda: Challenging yourself

P.M.: Why would you do that?

Rhonda: Because when you challenge yourself, you can understand things. If you are tenths, you need to move to hundreds and thousands.

P.M.: What else do you have to do?

Arnie: Work hard

P.M.: In what sense?

Arnie: If you're doing maths or literacy you have to work hard to get the answer

P.M.: What kind of working hard?

Arnie: Trying your best

P.M.: So what does hard work look like?

Rhonda: You have to uplevel your learning and extend your learning. If you don't extend your learning, you'll be like...

Arnie: Boring.

P.M.: So hard work is not boring

Both: *shake head*

P.M.: No?

Rhonda: It's educational

P.M.: Ok. But what does hard work mean?

Arnie: It means that when you do maths and stuff you're trying your best and you're not giving up.

P.M.: Not giving up

Rhonda: Achieving your levels.

Most of Rhonda and Arnie's answers in the above excerpts are 'standardised' classroom mottos, which is made evident by their brevity and specificity, their being expressed in the imperative (e.g. 'focus', 'work hard'), and by the use of specific, 'classroom-approved' words and phrases, which are either pertinent to learning attributes (i.e. challenge), or are frequently used by the teacher (i.e. extend your learning).

A.2.2 Structuring difficulty

Pupils also discuss their experience of goal setting and goal striving in the classroom as one prescribed by affordances and constraints. In the classroom, pupils are given space to regulate the timing of their progression from confidence in knowing to challenge towards expanding their knowledge. Pupils clearly assert that they are allowed to decide when they are ready, that is, confident enough to progress on to a challenging task. David and Lara show conviction in their approach to this:

> P.M.: What do you do when you want to start learning? What direction do you give yourself?
>
> David: A goal that won't make you be stuck on everything for long, but something that you know that you can do, and then go to something that can challenge you.
>
> P.M.: So first you do something that you can manage, and then you move on to something more...
>
> Lara: ... yeah, you move on to harder stuff. And then once you know how to do it, you can challenge yourself.

However, this process is not unregulated. Pupils are constrained by the method taught or applied for the particular task they are working on at the time, and by the grade level they have most recently been awarded by the teacher, verbally, or in a summative assessment/test. Pupils feel they have to rise to the expectations created by the task and by their grade, and justify their competence, or even extend it to a higher grade by engaging in challenging tasks.

A.2.3 Feedback

Limitations and affordances are also experienced in regard to verbal and written classroom feedback. All the feedback pupils perceive they are allowed to ask for and receive is regulated in terms of type and timing. There are specific types of feedback the teacher provides to pupils and pupils provide to their peers, and at specific times during the process of learning in the classroom.

Arnie: We solve it, and show the teacher the answer, and if it's right, she doesn't say anything. But if it's wrong, she says 'you've got to check it again'.

As Arnie's comment illustrates, there appears to be a structured plan for the provision of feedback, which suggests specific sources of feedback pupils can choose from. These sources, however, remain hierarchically sequenced, and, as Madison suggests, are to be followed thus:

Madison: If the person next to you asks you for help, and you try to help them but you don't know it, even if you're on the same question thinking about it, we can ask the teacher. And if the teacher doesn't know, we can look in the maths dictionary, and look up the word, and if you understand it you can go back to the number sentence or the word problem and solve it a little bit.

Written feedback is provided as an extension of the sequence followed for verbal feedback described above. Madison explains the sequence as follows:

Madison: [...] If they get it wrong and they're really not concentrating and writing the wrong answer, the teacher will write 'please, check again', and they shouldn't have ignored the green bubble that the teacher's given them, and they should do it and check it all over again.

Pupils also consult written feedback as part of the 'learning from mistakes' aspect of learning, described in section A.1.2. 12 pupils stated that written feedback also serves as a detour to following the process of requesting and obtaining verbal feedback once again, and green bubbles are available to revisit at any time, since they are given in the pupils' books. Sara and Lenora explain how they use the green bubbles:

Sara: ... and we need to do our green bubbles, because if we don't do our green bubbles, we won't really see that our learning's wrong.

P.M.: So how do green bubbles help you when you get stuck?

Lenora: Sometimes if you get stuck on a problem Miss T writes the same number sentence, so there's an example of how you could work it out, so if we get stuck again we can use that green bubble to help us.

Sara: And when we get green bubbles they kind of help us with our learning because she writes the same number sentence that we got wrong, and then says 'let's try

together', and then Miss T comes to us and she helps us with it and then it starts to get easier, and we know the answer.

It appears, therefore, that additionally to being a reminder of the correct method that needs to be used or of the correct version of the answer, the green bubbles are also viewed by pupils as an invitation for conversation between the teacher and the learner.

Sustaining motivation and rewarding good learning

The vast majority of pupils stated giving serious consideration to how the process of learning in the classroom is regulated through rewards and punishments. Rewards and punishments are perceived as a form of evaluative feedback given by the teacher, and their provision is also highly regulated in terms of type and timing. Good learning is rewarded by the awarding of specific privileges at a set time, and 'unsuccessful' learning results in the withdrawal of specific privileges, at a set time. Pupils follow the process of classroom learning, with an awareness of a justice system that imbues that process.

Ten pupils specifically discussed expecting positive rewards when they believe they have done learning that satisfies the combination of processes and values of the classroom. This, in turn, reinforces pupils' observance of classroom processes and values. Arnie and Lenora elaborate on their expectations of reward:

Arnie: Sometimes when we do good, focused learning, Miss T might give us treats and we feel proud of ourselves because we did excellent learning.

Lenora: Good learning is like, we always have to try our best, and then achieve our targets. And then Miss T has an inset day to see our handwriting when we do it. Maths, literacy, science or art, if we're writing on any of them, Miss T says she's always looking for neat handwriting, and if the whole class have their handwritings neat, the whole class is going to have ...

Sara: It's called a prize...something.

P.M.: Oh.

Lenora: the prize means we could have pen licence...

P.M.: Mhm. I see. So what are you trying to achieve by learning?

Lenora: Improving our handwritings...

A.2.5 Independence versus Collaboration

All 16 pupils who discuss the attributes of independence and collaboration, also extensively discuss the standardised arrangements made for doing learning in the classroom in terms of what degree of autonomy each arrangement provides them. They say that independent and collaborative learning are standardised in process and in timing, and pupils have to comply as asked by the teacher.

However, pupils described that there is a higher degree of autonomy when pupils come to realisation of needing help. In such instances, they are allowed to pursue either independent thinking or collaborative work to resolve the issue at hand. All the same, the rules that apply to collaborative and individual learning when imposed by the teacher are to be followed when pupils initiate these processes themselves.

As far as individual or collaborative learning as a solution to needing help are concerned, pupils describe modelling their decision-making on the process they surmise is followed by the teacher for choosing individual work or collaboration. An added value judgement, however, is that collaboration in help-seeking is to some extent regarded as dependence upon others, which is unacceptable, and that independent work is to be encouraged, because the autonomy it showcases is a transparent way for the teacher to view and grade their learning favourably.

Managing needing help, therefore, is experienced as requiring delicate execution. Pupils suggest that they know that they should be aware of whether they have past experience of the learning they are working on, and decide whether they need help accordingly. Seeking help if you don't need it appears to be objectionable. Lara and David stress the importance of a learner being honest with themselves, and not resorting to excuses, but rather regulating independence and collaboration on the basis of experience:

P.M.: How do you decide if you want to ask somebody or do it by yourself?

Lara:.....

David: You.... try and ask somebody.... um... for help, but if you know that you can do it and you just don't remember it, you just try harder to get your work done.

Lara: If you want to do it by yourself, then you can...

P.M.: So when do you decide when you want to do it by yourself and when to ask for help?

Lara: If you know you can do it...

P.M.: How do you know you can do it?

Lara:.....

David: Because, maybe once you've done it before, and sometimes you know you can do it and you say 'this is easy', you can do it on your own. If you're really struggling, like, don't know what to do, you ask someone.

Lara: And when it's really hard and you haven't done it before, and then you can't do it, then you should put your hand up and you should ask somebody.

David: Plus, if you're struggling with something, and then you get it because they've told you, you could start to do it on your own, and not ask others to do it, because they won't have time to do their own learning.

A. SYNTHESIS: INTERPRETATION

This section is my own analysis- interpretation of pupils' descriptions of learning as provided to them in the classroom. Although it draws heavily on the pupils' own descriptions, this is a researcher's account of them, and entails scientific description and links to existing theory on metalearning.

i. What do pupils know about what learning is meant to be like in the classroom?

Pupils construct descriptive accounts of learning in the classroom with direct, or indirect references to learning in the classroom as being conveyed and understood as a structured process with specific, sequenced steps, the application of which is meant to also engender certain principles (learning attributes). Beyond pupils' awareness of structures and routines, a significant feature of their descriptive accounts is that of the classroom as a space delimited by constraints and affordances.

As far as the process of communicating a thematic analysis to the reader is concerned, it required little effort on my part. Significant convergence in how pupils referenced key aspects of their experience leads me to assume that the routines and structures are potent to the extent that they have become visible to every pupil in the classroom, who can (in various degrees of clarity) articulate descriptions of them. For this first part of my analysis, I chose to minimize the hermeneutic depth of my interpretation to a thematic representation of pupils' accounts and descriptions of the social, collective, and negotiated experience of learning in the classroom. This entails a nuanced reading of Giddens' (1976) guidelines for social scientific description:

> Generating descriptions of social conduct depends upon the hermeneutic task of penetrating the frames of meaning which lay actors themselves draw upon in constituting and reconstituting the social world (p. 155)

with added emphasis on participants' views, to whom the frames of meaning seem to be quite familiar.

ii. Experiencing the classroom as an artefact of choice architecture

However, sense remains to be made of the overall stance of pupils towards the classroom as a space for learning. The description of a classroom operating on a rigorous system of norms and processes seems to have stemmed from pupils perceiving being asked to learn in a 'road mapped', carefully prestructured environment.

Literature in the field of instructional design is not always negative in relation to structured teaching and structured learning environments. However, it emphasizes a complementary gradual and parallel development of the pupil's personal discovery and learning (Welsh, 2012; Håkansson, 2015). In this case, however, pupils appear to express the affordances (being allowed to think/act/make use of opportunities) provided to them in the classroom as being equally structured and regulated as the constraints (imposition of limitations). This perception and description of an experience replete with routines suggests that pupils have come in contact with a choice architecture rigid enough to be visible.

Johnson et al (2012) introduce and define the term:

> Choice architecture, a term coined by Thaler and Sunstein (2008), reflects the fact that there are many ways to present a choice to the decision-maker, and that what is chosen often depends upon how the choice is presented. (p. 488)

This process involves designing and structuring environments (classrooms being one example) in which participants are invited to make choices. Although decision-making is a direct example of making choices, so is constructing descriptions, albeit indirectly. Choosing to describe the classroom in a particular way means the classroom has intertemporally been presented to them in that particular, or a similar way.

A permanent, consistently reproduced choice architecture does not, however, fully denote direct intentionality of the teacher. Teachers as choice architects

> have to design decision environments faced by decision-makers in light of knowledge about the decision environment (this is already being done) but also with knowledge

about the characteristics of targeted decision-makers and how they will process and draw meaning from information, or what their goals are. (p. 497)

This is admittedly a precarious position to uphold, and it has been consistently remarked that choice architects are rather likely to 'anchor first on what they themselves know or want, and then insufficiently adjust for other people's knowledge levels or preferences' (op cit).

Although the effects of regularity in exposing individuals to an unchanging choice architecture have not, to my knowledge, been explored by this particular field, they have been extensively covered by literature on enculturation (cf. Palincsar, 2005; Brown, Collins and Duguid 1989). Nevertheless, choice architecture can be a useful platform for identifying how the classroom communicates to learners what their experience of learning ought to be like.

iii. Signposting and regulatory media supporting classroom choice architecture

In their accounts of what they perceive their classroom experience is meant to be like, pupils seem to attribute particular influence to regulatory tools and media the classroom uses to communicate its intended structure. These tools are conducive to introducing and maintaining default configurations in choice architectures, which are defined as 'settings or choices that apply to individuals who do not take active steps to change them' (Brown and Krishna 2004). Communicating and ensuring the sustainability of default configurations requires using tools or media that maintain the configurations' 'appeal to a wide audience in their ability to guide choice, while at the same time preserv[e] freedom to choose' (Johnson, 2012, p 491).

Pupils identify classroom signposting to be communicated through the following tools:

- The learning attributes, which they cannot change, but they have freedom to choose between while learning in the classroom.
- Feedback, both verbal and written. Although pupils cannot change the type of feedback provided or the sequence in which it is provided, they preserve the freedom to choose initiating cycles of feedback, or seek further feedback.
- Resources, or materials used in the classroom. In their descriptions, pupils discuss linking learning to the use of specific toolboxes, or groups of resources regularly

> used for completing particular learning tasks. Classroom resources are standard, provided to each pupil, and used in groups of recommended alternatives. Pupils, however, feel they ought to use resources according to their teacher's instructions, despite the fact they could be allowed to use them for a different purpose in a different subject.

In conclusion, pupils clearly endorse their classroom as a space for learning, and proceed to unanimously describe the experience in it as one of following standardised processes whilst implementing specific values (learning attributes). Pupils discuss their understanding of the norms imbuing the classroom often through the use of 'should' and 'must' statements or through descriptions of collective, undifferentiated experience. These statements reflect pupils' views on the affordances and constraints which the routines and processes of the classroom effectuate. By identifying and describing the limits of their autonomy, pupils create a blueprint of the choice architecture guiding their classroom experience, through its effects. Specifically, they indicate that their understanding of what the classroom wants their learning to be like is shaped and communicated to them through the learning attributes, feedback, and material resources.

B. MY LEARNING IN THE CLASSROOM [Learning about how I learn in the classroom]

This section is a mediated representation of pupils' sense-making of their personal experience of learning in the classroom. I will thematically represent pupils' understandings and attitudes, with an aim of providing readers with pupils' own views on their metalearning. This section builds on the previous section in which pupils describe what they know about learning in the classroom, and enriches it with pupils' own, personal attitudes and rationalisations towards learning in the classroom.

Pupils' sense-making about how they learn in the classroom addresses my main research question:

- How do pupils construct/activate/ experience metalearning as it occurs in specific learning environments?

This will occur by reconstructing, through pupils' rationalisations, how pupils 'construct/activate/experience' making sense of their experience of learning.

This section is not structured as a presentation of separate, individual rationales, but as a thematic representation aiming to showcase the range of meanings ascribed to the same context of learning.

Finally, this section addresses all three research sub-questions in specific ways:

- RQ1a: What accounts do pupils construct of their metalearning as it happens in the context of their classroom? Pupils construct accounts of personal sense-making of learning in the classroom by constructing and communicating rationalisations about what they know about their learning and about who they are as learners.
- RQ1b: Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do? Metalearning is a process of making connections between different significant aspects of the pupils' personal experience of learning.
- RQ2: Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning? When discussing learning about their own learning, pupils indicate which elements of the physical and

social context of their classroom they choose/habitually observe to make sense of their own learning.

B.1 Locating learning and the learner in the classroom

B.1.1 Identifying occurrences of personal learning

Introjectively to the collective sense-making expressed through pupils' descriptions of what learning in the classroom means, pupils weave accounts of personal sense-making. In order to discuss personal conceptions of learning, pupils spontaneously resort to descriptions of events which they view as learning events, or moments. Locating one's own learning in classroom learning happens through identifying these temporal and interactional circumstances in which pupils are certain they experience learning as change, or growth. Pupils' descriptions also suggest that locating one's own learning can happen through realising and interpreting the impact learning makes on the learning self (a person's idea of who they are as a learner and how they effectuate that), or through interpreting how and why classroom learning contributes to one's personal learning (the ways in which it contributes to a person's own learning).

It is important to state that only 10 out of 23 pupils provided such descriptive statements without being prompted to do so. This is not taken to signify that the remaining 15 pupils could not, if asked, produce such statements, but that the former 10 were more keen to discuss their learning in the classroom through expressing ownership over it. Pupils' disposition towards personal ownership is evident not just in this segment, but throughout section B1, albeit presented here not through all, but selected statements chosen for showcasing themes in a representative way.

In their descriptions of events and moments of personal learning pupils suggest that the experience of making mistakes, specific feelings that they relate to learning, and strong internal motivation constitutes that learning is being, or has been achieved.

Kena suggests that learning happens through learning from one's own mistakes, which is one of the basic descriptors of classroom learning, as seen in the previous section (A.1.2).

> Kena: Learning is when teachers teach some children different maths or literacy or reading, and sometimes, if they get it wrong, that's learning as well. Because if you get everything right, then it wouldn't mean you're learning anything.

However, Kena does not limit her description to the endorsement of a classroom message. She provides a personal rationale for supporting that learning happens through making mistakes:

> Kena: Or maybe learning is when you..... learn, or somebody teaches you and then you go and try and maybe if they give you questions then you go and try and answer them. And if you get them wrong, then that means you're learning. But if you get them right every single time, then that wouldn't be learning.
>
> P.M.: So it's not learning if you get everything right all the time?
>
> Kena and Jade: Yeah.

Kena and her interlocutor Jade, support that making mistakes means making effort towards conquering new or expanded knowledge. Making mistakes is taken to mean that pupils are indeed out of their 'comfort zone' and are expanding their learning.

Additionally to interpreting cognitive cues, like realising mistakes have been made, pupils also suggest recognising feelings they associate with learning as soon as they experience them. Elizabeth best represents those pupils identifying occurrences of personal learning through affect. She perceives that feeling uncertain about a situation is a standard precursor for thinking and achieving learning:

> P.M.: Any other feelings you experience when learning?
>
> Elizabeth: Puzzled feelings
>
> P.M.: Is that good or bad?
>
> Elizabeth: good.
>
> P.M.: ok. How come it's good?
>
> Elizabeth: Because you try to think of how to do something. And sometimes I feel confused.
>
> P.M.: Is confused uncomfortable, or not? Or are you fine with it?
>
> Elizabeth: Fine. You just need to think about what you can do to get on with your learning.

Similarly to identifying learning through affect, pupils also assert identifying learning through feeling motivated. Although pupils do not know about the concept of motivation, they can identify its positive effects on their volition to maintain effort. Both Lara and Rhonda attest to this:

Lara: When I've done good learning, it makes me want to do more learning.

Lara: And when it's hard, I think that I can't do it. But then I try my hardest and sometimes I do it. So then I try harder.

P.M.: Can you tell me what good learning is?
Rhonda: It's like a good feeling and it makes you learn more and more and more.

Pupils identify personal learning in situations of task immersion. Intense thinking and concentration immerse learners in a state described in the literature as 'flow' (Csikszentmihalyi, 2014), in which nothing else exists or matters, but them and their learning. Olutomi describes such a state of task immersion:

P.M.: Does talking to yourself during learning help you?
Olutomi: It helps you by concentrating and ...
P.M.: Ok. How does it help you concentrate?
Olutomi: It helps you concentrate because when you're thinking you're not really messing about and you're concentrating. If people are talking around you, then you won't really be able to concentrate. But if you're thinking really really hard, then you won't even hear the people next to you, you'll just be doing your work.

Madison expresses positive feelings about being immersed in thinking about learning, which seems to her to be an experience devoid of minor concerns and stress, and full of anticipation for potential self-development:

Madison: I feel joyful, because when I'm thinking about things, I'm not thinking about when it's time for lunch or it's time for playtime. I think about when we're going to be getting to the next level and when ...

Although the 'flow' state discussed above is linked to more serene or neutral states, pupils who experience intense thinking and concentration also describe physical side-effects. Kena and Jade describe the experience:

P.M.: So what is hard thinking? What kind of thinking is that?

Kena: When you're concentrating on something, like a lot and you're not focussing on anything else and your brain hurts a bit.

P.M.: It does? Does it feel strange?

Kena and Jade: Yeah...

Kena: Because you're focussing, and then it's like...

Kena and Jade *make whizzing sounds*

Connie makes sense of this physical cue as a personal validation of quality, worthwhile learning:

Connie: You start really really thinking. And sometimes your brain starts hurting. Sometimes that means that you've worked really really hard, you made so much effort, so much thinking about it.

According to David, high intensity of focus and effort is to be palliated, since he interprets this cue as a confirmation that he has reached his limitations. In anticipation of such situations, he directs himself to continue learning by seeking help:

David: You... you feel like your head's hurting, because you've done a lot of learning [...]

David: If you're really struggling and trying to make your brain work, your head is going to start hurting, so it's best to ask somebody to help you.

B.1.2 The locus of learning: who is it that does the learning?

In their interviews, pupils often alluded, or made direct references to who it is that does learning, to who is ultimately responsible for their learning. Pupils' differing perceptions and rationalisations on the locus of control and responsibility for learning can best be seen as covering a spectrum of positions: six pupils identify with the view that learning is something that others do to them, and is therefore someone else's responsibility. 14 pupils suggest that learning is something they do. Of those 14 pupils, nine discuss learning as something that is optimally achieved together with others, while the remaining five discuss collaboration as a classroom mandate, and discuss learning as an individual endeavour.

An interesting nuance six out of these 14 pupils introduce is that, additionally to perceiving that learning is something they do, they refer to a distinct part of their self doing the learning, be that a part of their mind/personality, or a physical part, like the brain; in any case, an entity distinct from their self.

Nevertheless, it is necessary to state that there is significant overlap in pupils' position on responsibility and ownership, with almost all of them expressing more than one view during their interviews. This duality, or even plurality of attitudes expressed by the same person did not, however, stem from dialogic, gradual co-construction of their view with me or their interviewed peer. Pupils adopted different stances towards responsibility and ownership when addressing different meanings they gave to learning. Pupils who, for example, discussed learning as something that others do to them, later on referred to being responsible about implementing learning attributes.

While, at a first glance this might appear to happen due to pupils' conflicted stance towards responsibility, a second reading reveals a much simpler cause. Pupils' use of the word learning alluded to different categorical meanings of it. Learning could mean classroom learning, thinking, individual work, or personal engagement with furthering knowledge.

Although this categorical confusion or conflation gives rise to misapprehensions, it does not negate pupils' different attitudes towards responsibility and ownership. Even though each pupil might express more than one stance, one of those seems to be more consistent and have more weight in his/her overall attitude. These defining views are presented below.

B.1.2.1 Who is responsible for my learning?

For pupils, the issue of responsibility seems to constitute the basis for engagement and volition to reflect and make sense of learning. The less they feel responsible for classroom learning and taking a personal position towards it, the less they express tendencies towards questioning it and initiating personal reflection for the construction of personal meaning. Less acceptance of responsibility does not, however, signify lack of awareness. It is, as consequence, an awareness not followed by decision making, but a distanced reading of unfolding events and routines.

Learning is something others do to you

Olutomi is one of the pupils who view learning as something that is provided to him by others. Learning here is conflated with educational provision, and is therefore something externally imposed and undemanding of personal stance. According to Olutomi this reality of teaching is so objective, that it is almost absurd to inquire after:

P.M.: What is learning?
Olutomi: Oh. Education
P.M.: Ok, what do you mean by education?
Olutomi: When people teach you stuff?

Learning is something you do

According to the five pupils endorsing this view, learning requires the learner to do something as an individual. Caleb explains that learning means applying himself to learning through focus and concentration:

Caleb: When you really put your brains to your work?
P.M.: How do you do that?
Caleb: You focus and concentrate

An alternative view on acting to learn is the principle of action itself. Lara proposes:

Lara: And I think learning is when you do something and you learn from it.

Learning is something you do with others

The value of learning as a collective enterprise is a recurrent theme in some pupils' accounts. These collaborative-minded pupils do not believe there is no individual learning, but instead pinpoint quality and personal well-being in thinking and learning in a group. David illustrates this:

David: When you think on your own it's not very good, because, if you don't know what to do, you're just trying to make your brain have an idea, and if you're really struggling...

P.M.: It doesn't work?

David: Not all the time.

P.M.: When doesn't it work?

David: If you're really struggling and trying to make your brain work, your head is going to start hurting, so it's best to ask somebody to help you.

Learning is something that happens to you

An interesting attitude towards responsibility and ownership is that learning is something that happens to the individual without them realising, as a consequence of applying themselves to learning. This stance is one of endorsing effort, yet downplaying responsibility for constant awareness. Pupils endorsing this are likely to rely on (significant) others to tell them whether or not they have learned. Pupils are still on their way to doing conscious, deliberate learning, but are pursuing 'learning' on good faith because they are told that it happens to them.

Ava and Carrie discuss this view:

Ava: My dad said that you learn every day, but sometimes you don't notice.

P.M.: Interesting. Do you find that that applies to you?

Ava: Yeah.

P.M.: How do you realize that you don't learn every day?

Ava: I'm not sure.

Carrie: Well... as Ava said, my mum and dad say that 'you don't realise that you're learning, but you're learning every day'. So if I was a baby, a toddler, and I was just scribbling, it's still learning, because you're just scribbling anything, but you can still make letters.

P.M.: Interesting. So learning something you can do...

Carrie:... no matter what age and size you are.

P.M.:.. even if you don't realise that you're doing it.

Both: yeah.

P.M.: Can you do learning when you realise you're doing it?

Both: yes.

P.M.: You do do conscious learning.

Both: Yes.

Later on, Carrie will add that:

Carrie: A good learner would know when they are learning.

This is a statement regarding rationalising confidence. Although Carrie endorses the view that learning can happen without someone realising, almost like a transformation, she asserts that good learners would know when they are learning. She attributes therefore the capability of awareness to expert learners, a group, or rather a stereotypical aggregate, in which she does not feel like she belongs.

B.1.3 Am I learning, or is it Me who does the learning?

Amongst those pupils who describe learning as an act or process requiring personal engagement, discussing about the learning self, indicates a distinction between the subjective 'I' and the constructed 'Me' (the mind being the distinct 'Me', and the self being the 'I'). Pupils who seem to have arrived at a preliminary stage of distinguishing between the two often talk about 'themselves' and 'the brain' or 'the mind'. Moments in which the 'I' and the 'Me' are in conflict are quite memorable and significant to pupils.

Carrie, Ava and Kena personify their brain, indicating some distinction between brain and mind:

Carrie: Sometimes, your brain thinks your thinking is wrong, although it is right. That's complicated and annoying. Some stuff in my brain makes me feel mixed-up, so I think about what I'd done in previous weeks.

Ava: I keep telling myself to stop crying, because once you start, your brain stops working properly and you can't do it..

Kena: When you think, you could, like, in your brain you could be thinking about the question over and over again, and, because your brain would be thinking about it so hard, then it might come up with different stuff to help you.

The learning self can be helpful, or it can be a powerful opponent in stressful situations. It acts as the voice of consciousness. It can be complicit to the goals of the 'I', or it can oppose them. Carrie describes such a situation:

Carrie: There's a good side of my brain and a bad side. The bad side is saying: I can't do this, just, just..

Ava:..just stop.

Carrie:...don't do any more learning.

P.M.: What's the good one saying?

Carrie: You know you're going to miss your playtime and you know you're going to miss your lunchtime. You have to do your learning and focus, and then... because there's a consequence if you don't do your learning. There's always a consequence if you do something wrong.

David discusses following what his mind tells him to, and rationalising his actions through that inner voice:

David: [...] if you're feeling you can't do this, then your brain could actually tell you that you're working too hard, and you're doing more than enough, and you're doing more than your best but your best is really enough..

In this situation, the brain is the distinct entity which rationalises what the learning self does (the 'you'). So the 'brain' here mediates the actions of David, by providing him with commentary and directions on his learning.

B.2 Cognition: Thinking to learn: choosing/activating learning strategies and methods

Following methods seems to be highly valued in the classroom, as pupils express the view that it reflects structured thinking. By methods/strategies, pupils do not refer to learning strategies as discussed in literature about self-regulation and the process of learning itself (Schunk and Zimmerman, 2013), but to different ways of implementing operations in mathematics. The word and concept of method or strategy being therefore exclusive to mathematics often also led pupils to discuss mathematics only when reflecting on structured thinking. This happened regardless of pupils expressing that structured thinking does also happen in the subject of Literacy.

Pupils' structured thinking in Literacy, however, was not called method/strategy, resulting in pupils not discussing thinking through methods in general. Further comprehensive discussion on subject specific reflection on cognition is provided in Section D.

Nevertheless, 21 pupils consistently addressed valuing structured thinking through the application of methods/strategies. The general perception was that methods, by value of being structured and systematic, lead the student to the correct answer. Lara illustrates in the following way:

> P.M.: Is it important for you to know the method?
> David and Lara: Yes.
> Lara: Because if you don't know the method then sometimes you get the answer wrong and you know it. But you get the method wrong and then you get it wrong.

In order to include all pupils' understandings about thinking to learn in a structured manner and avoid limiting my scope to the application of operations in mathematics, I chose to engage with all views reflecting structured thinking. To identifying and presenting pupils' structured thinking I chose to follow the rationale of the literature cited above (op cit), and include wider strategies, or personal plans for thinking that pupils follow to achieve learning. These might include the application of methods, or extend well beyond those.

B.2.1 Learning strategies and methods

Pupils' thinking about knowing and learning reflects their combination of classroom suggested and encouraged ways, as well as personal, and tailored to support individual needs ways of thinking. The vast majority (19 pupils) openly discussed classroom favourites and personal favourites, with four pupils not discussing personal ways of thinking at all.

What is important to stress at this point, is that all pupils did indeed use these strategies as part of a plan, and that all 21 pupils expressed the same rationale for thinking about thinking: getting an answer. Pupils, therefore, use strategies to achieve getting an answer (usually unique) set to them. Finally, all 19 of them discussed when and why they choose to use methods considered to be classroom, or personal favourites.

Classroom favourites

There seems to be the prevalent, unspoken rule of the classroom that, once a strategy/method has been modelled and suggested by the teacher, following it is almost non-negotiable. Amrita confirms:

> Amrita: First you soak up all the things you need to know and then you use it in your learning.

This choice is based on pupils' expectation, and often the classroom reality is being assessed on the method used as well as the answer reached. More so in the case of the method itself being the objective of the day's lesson, in which case application is absolutely necessary.

Either way, the pupils who experience structured learning in the classroom express being constrained to a specific method when thinking about learning, the correct application being an ends in itself. Rhonda asserts:

> P.M.: When you say thinking about the method, how do you do that? What do you tell yourself to do?
> Rhonda: Focused.

P.M.: Ok, you need to be focused about the method. And then what do you do about the method?

Rhonda: If we've got the method wrong, we rub it out and do it all over again.

In their interviews, pupils suggest the existence of classroom favourites, or classroom standard methods used in specific subjects or lessons. The number line method, grid method for operations, and other methods of that kind are examples. Pupils' references to classroom favourites are almost exclusive to methods modelled by the teacher used, and are particular to the object of learning (e.g. subtraction, fractions, etc.). Pupils adjust and readjust their preferences of a method to the grade criteria introduced every term, which introduce which method is the new classroom favourite, or is to be achieved through challenge.

Alternative approaches

However set the classroom favourites are, all pupils discuss having a personal way of thinking. More confident pupils, like Amrita and Kena, discuss having alternative ways of thinking about the application of classroom favourites. Interestingly, it is the less confident pupils who discuss using methods that are alternative, or have been learned elsewhere than the classroom for thinking and getting an answer to counterbalance weaknesses in their thinking and knowledge.

Elizabeth, an EAL pupil, discusses having to compensate for her weak vocabulary:

Elizabeth: Look at the pictures instead of the words if they don't know and try to figure out what it might be about.

Elizabeth: Try and figure something similar to the question

P.M.: Ok. Similar how?

Elizabeth: Similar to the question. If you answer a question similar to that question, you might get the same answer.

Pupils suggest that following methods or even parallel methods is not always useful, especially in unstructured tasks. Lara suggests that there are times when it is likely to not know which method to follow. In such instances, her strategy is the following:

Lara: If something's gone wrong and you don't know what to do, then you can ....ask... you can think about how.... what would happen if they don't do something, and then do it.

Instead of approaching her tasks in a conventional way, Lara appears to turn to lateral thinking when in difficulty. Predicting what others might overlook might be the advantage Lara is aiming at, and which can secure her originality, and perhaps better overall quality in group work.

B.2.2 Criteria for selecting method

Pupils set specific criteria for selecting the strategy they feel they have to, or that they wish to apply. Although classroom favourites and personal alternatives are at their disposal, their preference depends on the following:

Balancing level of task difficulty with available time

This is the most popular criterion, with 16 pupils mentioning it in their interviews or agreeing with their interviewed peers. Jade and Kena complement each other's views in their interview:

Jade: Think about methods that your teacher's told you, and other people have told you and easy methods that help you get the answer really quick.

Kena: Well I use the partitioning method which is one of the easy methods that help you get the answer quickly...

Levels of confidence and experience on method/task/object of learning

Constructing knowledge through experience seems to be important to pupils and to weigh heavily in their process of choosing challenging or convenient and well-known methods. With the scaffolded assistance of their teacher, pupils perceive that their accumulated experience, confidence and competence reaches a point at which their volition towards challenges is activated and is not longer threatening to their self-esteem. Sara describes:

Sara: Well, if we're doing our grid method, and we've never done it before, then Miss T goes through it with us. And then if she gives us a hard one because we've done a lot of easy ones, so we have to try and see what we've done before and see if we can do it with the other ones.

However, some pupils perceive the process of choosing between different, perhaps more challenging methods as quite a challenge in itself. Since autonomy in choosing the level of challenge is a key feature of the classroom, pupils can choose to not make more challenging choices in regard to methods, and prolong their confidence-building endeavours. An interview in which competence and confidence building is evoked to justify remitting choosing new methods is that of Rhonda and Arnie:

Arnie: Well, basically, when we do the method, we can't do the bus method, because we don't understand it. We do a good method like the number line method to get our answer.

P.M.: So you choose which method to use.
Rhonda and Arnie: Yeah.
P.M.: How do you choose?
Rhonda: We only do the ones we're confident with

Arnie: You have to do different methods. But if you do a method you're not comfortable with, but if you wouldn't know how to do it or what the answer is, you have to do the method you're most confident with.
P.M.: How did you decide that?
Arnie: Because nearly all the time we do number line methods so we get confident with that and we understand it more.

Rhonda, Arnie, and 13 more pupils describe making judgements about their levels of confidence and experience to regulate making challenging choices. However, the extent to which pupils state a preference towards feeling comfortable with adhering to their usual choices varies; while some pupils describe confidence as being part of the process of progressing towards challenges, others describe confidence as a non-negotiable prerequisite for selecting and applying methods, unless specifically instructed otherwise (to specifically work on challenging methods in order to build confidence).

Finally, cases in which the levels of confidence, competence and experiences cannot be appraised by the pupils themselves, and be used as a guide for decision-making are usually described as 'being really stuck'. Connie speaks for the vast majority of the pupils, 20 of whom state that in such cases the teacher is asked to provide a resolution.

> Connie: When I'm really really stuck, I tell the teacher. If I'm only a little stuck I always think in my head 'I can do it' and if I think I can do it, then I get the right answer.

Managing others' expectations on one's level of competence

Three pupils were highly concerned about how others perceive them, leading them to factor others' expectations of efficiency into their consideration for choosing how to think to learn and answer questions. David explains:

> David: So if you're the smartest person in the class, and everyone's expecting, and then something really bad happens, everyone might be expecting you to do something. But if somebody else comes and gives you an idea, you could work together and make an idea together instead of being the one person... you might not be strong enough to do on your own.

Level at which applying method supports exerting control over/subduing feelings of confusion

Although all 23 pupils describe applying methods in writing, three pupils provide an interesting rationalisation as to how this helps their learning. The structure and explicit visibility of their thinking process provided by choosing and writing down specific methods serves to diminish feelings of confusion. Lenora exemplifies:

> Lenora: If it's a number sentence, we can write it down on a whiteboard and try to think our task again and then we won't be confused because you will understand more.

Written methods are a norm in the classroom, with what pupils call mental learning, which

requires thinking without writing, considered to be a mark of expertise. Pupils believe mental learning to be their ultimate goal of learning, complete intellectualisation of the process of learning. This attitude further asserts their preference for written methods in all circumstances but that of absolute expertise, which none of them describe having reached for any aspect of their learning or classroom life.

Congruence and compliance with learning attributes

Since the learning attributes have such an important effect on classroom learning, pupils also endorse their influence on the process of choosing methods. Whether pupils find it is important to use learning attributes to justify their choice of method to the teacher, or they find the attributes to be helpful to their personal learning, choosing methods and directing themselves to learn often involves consideration of these principles. In the context of method choice and use, Madison discusses:

> Madison: I say in my mind that I can do it and I need to try my best and use the cheetah and Lenny the Lion and challenge myself. I keep saying these things in my head, and if you keep saying it when you're writing then you'll get the right answer, you
>
> P.M.: So how does thinking that get you to the right answer?
>
> Madison: I'm not really sure.

Like Madison, no pupil can explicitly explain how exactly the learning attributes assist or support their process of choosing methods and directing their learning. However, each pupil suggests considering different learning attributes when choosing or considering methods. My interpretation of this consistent consideration is that pupils use the learning attributes for motivational support: they find the attributes to be a useful medium for putting their strengths and weaknesses into words, which, in turn, procures them the emotional security of being able to attribute their rationalisations and choices on to an unquestionable principle, if called upon. Sara discusses alleviating her anxiety in such a way:

> Sara: (when I feel nervous) I keep telling myself to keep challenging myself. [...]When feeling stuck, I keep reminding myself to persevere.

B.2.3 Provenance of strategies and methods

While pupils' rationales for applying methods seem to be quite varied, their understanding of where they obtain methods for working and thinking about their work is limited to specific answers.

Thinking and self direction

The process of personally constructing one's own way of thinking or personalising classroom methods indicates a preference towards independence, which Kena and Lara showcase visualising the problem on a number line, and eliminating ineffective methods:

> Kena: ...you could think the question through. If it's about three big numbers, then you could put the biggest number first and then the second. Because if you put the smallest first, then you might have to go to negative numbers and then it'd be harder to get the proper answer.
>
> P.M.: How about you talk to yourself?
> Lara: Then you can gradually get different ideas to fix the problem. [...] I just put the problem in my head and then think of solutions. Ideas how the problem is, and then how the problem can get worse, and then I do it. So when I do the ideas, I know that if I do that it will get worse, and then I just think of one that's good.

Others' suggestions

Quite regularly, and particularly in collaborative settings, pupils resort to their peers to remind them about all the methods available to them, from which to choose. This is viewed by 16 pupils as a major advantage of collaborative learning. Kena explains why, and how others help with methods:

> Kena: Um, they [people] could help you with different methods.
> P.M.: Such as?

Kena: Maybe the expanding method, or the column method, or the number line, or the partitioning method.

I Would they only suggest the idea, or help you do it as well?

Both: Suggest the idea.

It appears, therefore, that hinting is preferable to helping solve a question, since the ambivalence of decision making can be resolved in collaboration, without the situation being technically considered as collaborative.

Materials in the classroom

The physical environment of the classroom can be used as a reminder of methods, not unlike peers. Lara expresses the most common view about using displays to review the range of methods that are known and available to pupils:

Lara: [...] also we have a maths display so I look at it when I do my maths.

P.M.: How does that help you?

Lara: Because then I know how to do it.

P.M.: Just from looking at the display?

Lara: Because it shows you the method that is easiest, and then how to do it.

Jade and Kena showcase another interesting use, also supported by 4 other pupils. Displays are used as method matrixes, into which pupils project current maths sentences, for example, in order to solve more easily:

Jade: There's some things on the wall...

Kena:... like posters, and numbers. Sometimes there's carton that says thousands, hundreds tens and units and tenths, and... (describes number line with gestures)

P.M.: How do you use those to help you?

Kena: If you have a question with points and it's a plus question, you could look at that and cut out the bits that isn't from the point and then put your question numbers in the boxes for tens, and when you do that you could partition it. And if it's an adding question you could add all of them together to get the answer.

This use, however, is restricted in assessments, or after some time, because the displays are frequently renewed by the teacher.

Decoding problems/questions

Pupils perceive that specific words or word patterns in problems are indicative of the method pupils need to use. Missing such words might create problems with selecting appropriate method.

Rhonda: We read the question again.
Arnie: Until you understand it.
P.M.: Why read the question again?
Arnie: So that you know what it says and you'll understand it
Rhonda: Maybe because if you miss some words, then you might forget all of the things that you need to do.
Carrie: You have to think deeply about what the question is trying to ask you
P.M.: Figure out what it means?
Ava: Yes
P.M.: And then what do you do?
Ava: You ask yourself what does it mean and how to figure it out, if you're adding, subtracting,...
Carrie: ..what operation you're going to be using.

Pupils' belief that the answer is codified in the problem statement, and therefore inherent in the problem itself as something to be decoded, led to a recurrent, persistent use of the phrase 'figure out' by 19 pupils.

Teacher

Additionally to the teacher introducing and modelling new, challenging methods, pupils, Ava and Carrie remember an instance of the teacher providing a visual example of structuring thinking:

(They talk between themselves)

Carrie: Remember that thing Miss T told us, about that thing, the bag...

Ava:...

P.M.: What?

Carrie: Miss T told us there's this 'something' bag, and first you read it, ...

Ava: Oh Yeah!

Carrie: She said 'read it', then... underline it. Um.. you write.. no!

Ava: It was like one of those things that it goes down and it has all the letters ,...

Carrie: ...operation. And then you write it, and you check it, and then after that you've solved it.

P.M.: Interesting. Do you have one of those?

Both: Yes

P.M.: In your book?

Both: No

Ava: She's only showed us it twice.

Carrie: on the whiteboard.

This seems to be a variation of the writing-solving-checking sequence described in section A.1.1., and to be a formula for thinking to solve problems. Since it was not, however, made available to pupils in writing, or through repeated presentation, its value has diminished to being conflated with the writing-solving-checking classroom routine.

B.3 Affect: What learning in the classroom feels like

Pupils' accounts of their personal experience of learning are deeply imbued with references to affect and emotion. Learning appears to pupils as a process of expanding their knowledge and their learning self, guided and accompanied by a strong undercurrent of emotion regarding growth. Feelings regarding the learning self, the classroom, peers, and the process of learning itself are often illustrated by pupils. This is in strong congruence with Moore's (2013) research on pupils' awareness of themselves as learners with particular emphasis on 'emotionality': the emotional impact of love and fear as demonstrated or anticipated in the form of teacher and peer approval is a strong theme in pupils' metalearning accounts. However, pupils in this research extend their focus to their inner learning self and to the personal process and emotional experience of learning, which, in juxtaposition with Moore's (2013) own research, potentially indicates that the emotional range pertinent to metalearning is wider and more obfuscated than feelings and notions of love and hate.

What is particularly interesting in the present research, however, is that pupils do not allude to affect and feelings when describing learning in the classroom. This indicates that there is no standard classroom mode or norm in regards to affect, since no 'should' or 'must' statements are given by pupils in relation to affect. Affect and emotion seem to be perceived as a deeply subjective aspect of the experience of learning, and therefore outside consideration of regulatory norms.

The strong subjective and weak descriptive mode in which pupils communicate affect, feelings and emotions relevant to learning also indicate the absence of a classroom norm delineating these matters. Pupils do not use a pre-decided language for feeling and managing emotions relevant to learning, as they do about cognition through the use of attributes and the endorsement of the teacher's language for operationalising them. Oppositely, language about feeling is unregulated, varied, and much more powerful than about thinking.

Feelings about learning and about being a learner in the context of the classroom were expressed by most pupils. However, 3 boys did not make any reference to their feelings about learning. The teacher later suggested the influence of their ethnic backgrounds on their openly expressing sentiment.

The 20 pupils who made reference to their feelings about learning expressed which feelings arise from the process of learning both individually and with others in the classroom, and the effect of their feelings on subsequent learning.

B.3.1 Feelings related to challenge-confidence-challenge experience

Pupils openly discuss feelings about what they view and describe as the core process of learning in the classroom: the challenge-confidence-challenge cycle of learning. As, however, described above, there is no classroom language for affect, and therefore an interesting theme emerged here: pupils used the words challenge and confidence to also describe their feelings. The semiotic use was differentiated in inference and reference. When referring to the classroom (description), pupils use challenge and confidence to denote challenging tasks and competence, whereas when inferring their personal stance and attitude towards classroom learning, they use challenge and confidence to denote the effects of challenge on their emotional state, and the self-belief that accompanies competence respectively.

This distinction is quite conflicted, especially when it comes to competence. Because challenge is often provided through whole-classroom teaching, pupils seem to make more references than inferences on it. Challenge is a staple situation in the classroom. Confidence, however, is deeply personal. Even when pupils make references to confidence as a whole classroom state ascertained by the teacher through grade criteria, each learner is simultaneously aware of their own, personal level of confidence in regard to that achievement. So although confidence and challenge are standard phases in classroom learning, personal confidence and challenge might fluctuate temporally or dynamically within that standard range suggested by the teacher for the whole classroom.

Feelings that accompany Challenge

Although challenge is accompanied by feelings of optimism, since it foreshadows learning and performance advancement for pupils, the everyday experience is described as emotionally turbulent. Ava and Carrie discuss:

> Ava: Sometimes I feel a bit scared, because when Miss T gives me a challenge, I feel like I'm not sure I can do this yet. But I persevere and try.

Carrie: Same with me. When Miss T gives me a challenge, I feel ' why did I tell Miss T I finished, I knew this was going to happen'. I just kept on saying 'this is going to happen in many stages of my life, so while I'm young I need to learn, and just be happy'.

P.M.: How does feeling confident affect your learning?

Carrie: It pushes me to another level. I go home and I keep revising, and next I go to school, I go 'Miss T, can you give me a challenge?' and when she gives me a challenge I'm like *mimics horror* 'I'm doing this? I don't even know how to do it'.

While the vested interest in completing challenging tasks is endorsed by most pupils, it has repercussions when pupils feel unable to solve the task. Madison describes experiencing an emotional state disabling her thinking:

Madison: If you're stuck on your challenge... sometimes I get sad.

P.M.: Why?

Madison: Because I'm always stuck on my sentences

P.M.: Why does that make you feel sad?

Madison: Because I can't concentrate enough, all the sounds around me are getting louder and louder and I can't concentrate. I get sad.

All pupils seemed determined to avoid being in such states. Although some are closer than others in having a personalised response to the situation, most pupils are oriented towards making use of available help around them. As Madison explains, help is not necessarily sought for cognitive assistance, but more often for emotional security:

Madison: Sometimes I get happy when the teacher's sitting next to me, helping me do the work and everything. I just say that 'I can do it, I can do it' and then she leaves, and after a while when she comes back, she asks ' are you finished?' and I say 'yes'.

Feelings that accompany Confidence

Confidence, denoting both states of competence and of self-belief accompanying competence is experienced positively. Confidence is also perceived as a self-sustaining mechanism, since being confident leads to better understanding and more confidence in turn. Ava illustrates:

> Ava: Good feelings are like when you know that you can do it and you believe in yourself. [...] It helps you so you can focus more. And then you start to get the right answers and understand your learning.

B.3.2 Feelings related to the self

Intertwined to pupils' expression of feelings about the process of learning were suggestions that pupils experience affect not only relevant to that, but also to themselves as learners. All 19 pupils who discussed feelings discussed their feelings about learning as a cause and/or result of who they are as a learner. A cycle of learning begins with affective predispositions, which are either reinforced or altered by the outcome of that learning, and subsequently usually become the affective basis for the next cycle of learning. Ava and Carrie exemplify this cycle:

> P.M.: Oh. Now, you said that learning gives you feelings, but do good feelings affect the way you learn?
>
> Ava and Carrie: Yes.
>
> P.M.: How?
>
> Ava: It makes you more... better about yourself. [...] It helps you so you can focus more. And then you start to get the right answers and understand your learning
>
> Carrie: It pushes me to another level.

Feelings pupils relate to the learning self were mostly tied to their idea of who the classroom wants them to be, and how these feelings support or undermine that goal. In this particular classroom, pupils suggested that the predominant feelings were related to competence and performance.

Observable in most pupils' discussions on such feelings is the use of a deficit-based language, through which pupils tend to assert having strong or influential feelings about what they have

not achieved in relation to what drives them. However, this should not be perceived or interpreted as defeatism or pessimism on their behalf. Pupils seem to discuss who they are and who they feel they need to be in an effort to bridge the distance, rather than wallow in self-deprecation. Interestingly, a significant number of pupils were quite reluctant to admit to negative feelings. The expressive manner, however, in which they described positive affect, was strongly indicative of them describing who they would like to be and how they would want to experience, rather than their everyday life of affect.

Feelings related to the learning self: the issue of Competence-Confidence

As discussed in section B1, pupils discuss using their feelings to identify occurrences, events, or episodes of personal learning. Some describe learning as a feeling, others discuss feelings causing or supporting cognition, and others posit that the feelings they know to follow learning are an indication of learning having happened when they next are experienced. What remains central, is that the issue of confidence and competence in identifying learning is strongly linked to affect. Ava suggests:

> Ava: Good feelings are like when you know that you can do it and you believe in yourself.

Pupils appear to perceive the importance and the worth of self-assessment for independently ascertaining their confidence in their own knowledge about their learning. Although all pupils who discussed making judgements on competence discussed its importance, those pupils who discuss competence in relation to affect were significantly fewer. This disparity could be attributed to competence-confidence being viewed as a predominantly cognitive feature in the cycle of learning.

Nevertheless, 16 pupils did discuss how their feelings influence their perception of who they are as learners, sometimes in juxtaposition of who they might want to be and what they might have to do to achieve competence and confidence. Connie exemplifies:

> P.M.: Interesting. Are feelings important for your learning, Connie?
> Connie: Yes, but sometimes I feel a little bit angry with myself
> P.M.: How come?

Connie: I know that I can do it and I'm not doing it. Sometimes I say to myself 'you're not trying your best, you need to try a little more harder and harder'.

Competence appears to be perceived as an attainable quality by pupils, whose stance is one of motivated striving toward it. However, no standardised criteria for who each pupil needs to be as a learner to achieve that, leads to intensive reflection as problem solving. Although not alone in this position, David discusses that self assessment and self-regulation are also problematic due to pupils' lack of confidence in who they have chosen to be as learners, which results in insecurity and seeking regulation and affirmation in others' opinions. Is who I am enough? David asks:

David: Say, if you've just done really good learning, and you're going to a cricket tournament, and you hit the ball, and you don't get it really right, and you tell someone; and he asks you 'is your best enough?' You can use your feelings and say 'yes'. But sometimes you say no, because you don't want them to think that your best is not enough.

Feelings, in this case, are a proposed guide out of that conundrum. Using one's own intuition and feelings can possibly procure the learner with an accurate guide of who they are and who they want to be. However, as David asserts, the process becomes complicated when lack of experience and expertise are factored into the syllogism. Even further complications are likely to arise when consideration of the social identity of the learner is factored in. Carrie confirms:

Carrie: Being able to... to show that I'm confident in my learning.

One last dimension of feelings related to confidence is their motivational value in sustaining it. As discussed in the previous section on challenge, pupils perceive the confidence of their learning self to be threatened. As a response, pupils make an effort to desist from yielding to disappointment, and make an effort to activate and initiate positive feelings. The feeling of confidence seems to be of decisive importance towards that goal. Lenora describes:

P.M.: Ok. Are feelings important to you when you learn?
Lenora and Sara: Yes.
P.M.: Do you feel influenced by them?
Sara: Sometimes

Lenora: Yes...

P.M.: What kind of feelings?

Sara: Sometimes I'm nervous...

Lenora: Confident. And if we see a big number, some of us are scared that we can't work it out. But it's ok if we just pen the numbers down and then we can work out the answer, and then we'll be ok.

Feelings related to performance

18 pupils further elaborated on confidence and competence, and linked their feelings about learning to specific concerns about performance on specific tasks. Although not all these pupils expressed experiencing affect in relation to performance alone, it seems that both positive and negative feelings are anchored on performance in their everyday learning:

Nasatya: Like when I've got 50%, because I haven't got the full percent and I'm proud of myself and half proud and half upset, because at least I got 50%

Rhonda: If my handwriting is bad, I go to Miss T, and she said 'do it all over again', and I feel disappointed.

Nevertheless, the classroom culture of learning through reflecting on mistakes and the acceptance of mistakes it encourages, leads a few pupils to rationalise performance as secondary to effort. Pupils therefore seem to be choosing to heed feelings related to effort, especially those that are positive and conducive to a positive view of the learning self, and disregard those feelings relevant to perfectionist views of performance. The degree, however, to which each pupil absolutely privileges positive over negative feelings in relation to performance, varies significantly. For example, Iris directly asserts that successful performance is led by effort:

Iris: When you're stuck on something, but you've worked so hard that you get it right and the teacher ticks it, you go ' Oh my gosh, I actually got it right!'

On the other hand, Rhonda discusses deriving positive feelings from performing at minimum classroom standards, and therefore affiliating her efforts with a small, but positive outcome:

P.M.: How did you feel during this learning?

Rhonda: I felt... quite proud of myself.

P.M.: After you finished it? Or during?

Rhonda: During. Because at least I tried my best.

P.M.: Why did you decide to try your best?

Rhonda: Because if I didn't try my best, I would not get it. Plus, when I'm doing my learning I won't get all of it right.

B.3.3 Feelings about learning affect subsequent learning

The issues of continuousness of feelings and the effect of that on further learning is an issue on which pupil perspective is divided. While 9 pupils expressed the view that feelings are fleeting and therefore have no effect on further learning, 13 discussed identifying some effects on their learning. More specifically, the effect of feelings on subsequent learning was discussed in terms of how it supported or hindered the flow of their learning, as well as pupils' decisions for counterbalancing or making use of the effect.

Feelings of confusion make thinking more difficult

Pupils identify specific feelings which they believe affect their ability to think. Situations in which pupils feel stuck and unsure of how to proceed seem to have an affective undercurrent. Feelings of confusion appear to augment the stress pupils experience. Elizabeth discusses:

P.M.: Does having those feelings affect the learning you do after that? So if you're feeling a bit puzzled, or uncomfortable, what happens to the learning you do after that? Does it affect it?

Elizabeth: A little bit.

P.M.: how?

Elizabeth: Because it gets harder and harder and you need more thinking time.

P.M.: So feelings make it harder to think?

Elizabeth: Some feelings.

P.M.: Which ones?

Elizabeth: Confused feelings.

While Elizabeth does not view such experiences as an impasse, and allows herself more time to think, David experiences being stuck as an emotionally overloaded crisis, leading to 'somatisation' (Kirmayer, 1984):

David: Sometimes, when something is really hard and I try to get my mind to help, sometimes your chest starts hurting.

Pupils do tend to experience negative feelings linked to uncertainty and time constraints, which make both thinking and learning more difficult. Although the effect of feelings is not discussed as distortionary to the sequence of the process, it does, however, appear to affect pupils' capabilities of implementation.

Moreover, a negative feeling as the outcome of unsuccessful learning or task completion is likely to create further worries for pupils by being projected on to their future learning. Iris illustrates:

Iris: I think if it's [the feeling] negative, it makes me feel more worried, if I'm going to do it the next time.

Feelings of confidence make thinking easier

Pupils, who throughout their interviews have described confidence as both a feature of classroom learning and a feeling, discuss how experiencing feeling confident has a positive effect on their thinking. Lara proposes:

Lara: When you think that you can do it, then you can do it, feeling that you can do it gives you more...uh...
P.M.: So if you feel that you can do it what happens to you? Better learning?
Lara: Yeah. If you feel that you can do it then you have it in your head and then can think really hard.

The value to learning/performance of feeling confident, however, is expertly phrased by Kena:

Kena: Through all your journeys in learning, then if you're not confident in them, you'll just be doing stuff. Without thinking. You'll just be writing an answer instead of doing a method and thinking through before you just write the answer.

Her view, which was unique in addressing the impact of affect on overall, long-term learning, emphasises the importance of feeling confident and using that confidence in further learning.

Feelings do not affect routine learning

As mentioned in the introductory paragraph of this segment, 9 pupils suggested that feelings do not affect their learning. Rhonda and Arnie discuss:

P.M.: So if you do some learning, and you get a positive feeling, perhaps, so you're happy that you've done good learning. Does it affect the learning you do after that?

Rhonda: No.

Arnie: because you already know the method to do the ..., you already know it. Basically, if you've got a number sentence and you got it right, and you're shown the same number sentence, you'll know it's right.

Rhonda, like the other 7 pupils endorsing the minor influence of feelings on learning, is absolute in her negation. Arnie, however, introduces an interesting rationale for his stance, and suggests that knowing how to think in learning routines and also getting a correct answer makes the effect of feelings minimal.

Feelings might lead to helpless response

The most identifiable and influential feeling amongst pupils was that of nervousness in view of challenging tasks. 19 pupils discuss their response to negative or ambivalent feelings being one of help-seeking. Sara discusses how she has observed that her response to feeling nervous leads her to seek help even when she knows she does not need it:

Sara: Sometimes I'm nervous...

P.M.: So the initial feeling is nervous?

Lenora and Sara: nod

Sara: And sometimes when it's an easy number like 23+20, we will look at it and do it straight away. But if it's a big number, like 1224+133 then we would get nervous and scared. And know that we can do it, but sometimes we just ask for help because we look at the big number and we see that we're going to need help. But we don't really need help.

Pupils describe their reactions to negative feelings through powerful language. Unrestrained by classroom norms in both vocabulary and protocol or process, pupils choose to either postpone action until help is provided without asking (in the form of green bubbles), like Carrie, or to ask the teacher for verbal feedback and help, like Ava.

P.M.: Interesting. And how do bad feelings affect the way you learn?

Carrie: It overcomes me.

P.M.: Do you stop learning, do you think?

Ava: Yeah

Carrie: I sit back in my chair

Ava: and almost every time I call Miss T to help me.

B.4 Motivation: Motivating oneself to learn

Motivation was generally viewed as a personal issue by pupils, and not as a responsibility of the teacher. They viewed motivation as sustainable self-direction attuned to their personal goals, both in long and short-term goals. Pupils discussed long term goals the existence of which adds motivational value to their everyday learning, because they guide them towards an ultimate life purpose. However, when discussing their short-term goals in everyday learning, pupils discussed the value of motivating themselves through and out of 'feeling stuck'.

Although pupils had very similar views on everyday motivation as self-encouragement, their idea of how long-term goals support their everyday learning differed significantly. Pupils suggested that these two temporal streams of motivation are linked, with 16 of them showcasing consistency in the manner of pursuing and sustaining long and short-term goals.

B.4.1 Goal setting and goal striving as media for sustaining motivation

All discussions suggested pupils placed special value on learning, which they regard as a highly valuable asset for achieving their future. As expected, the future each learner desires for themself is unique in outcome, but the manner in which each pursues that future is not. My reading of pupils' suggestions on how learning can help them be who they wish to be is that learning-related goals guide pupils' strategy for learning: there are ends to be achieved through successful learning, means through which to improve and sustain the pursuit of success, and ways which can ensure the uninterrupted, non-problematic pursuit of everyday learning, trusting it will yield benefits. Motivation, is therefore seen by pupils as a thread of consistency linking who they are and how they learn with who they wish to be in the future.

As discussed in Chapter 3, strategy is less definite than a plan, since it constitutes the regulation and balance of ends, ways and means for achieving a goal. In this case, pupils regulate and balance ends, ways, and means particular to learning in order to achieve the future learning self that is currently appealing to them. It is likely, therefore, that priorities can shift to a different view of the future learning self. An interesting side to regulating and balancing motivational choices is that most pupils showcase a homeostatic understanding of balance. This understanding is evident in pupils not choosing one strategic aspect to the complete preclusion

of the other two, but privileging, or expecting greater benefits from one view of learning than the other two, which are viewed as secondary.

Pupils' choice of privileging a specific aspect of learning with a view of sustaining motivation and achieving a desired future self is presented through the nuanced distinction of learning as ends, ways, and means.

B.4.1.1 Learning as part of a wider strategy for success in future (ends)

When asked about what learning means to him, Arnie responds:

> Arnie: It's something that when you get older and you get an education, then you'll know what to do.

This view of learning is the most popular among classroom students. Various degrees of specificity all alluded to an understanding of learning as something that has to be achieved, and will be essential to a successful adulthood. Pupils expressing this view seem to have a specific view of the goal they want to achieve (learning), and allow for changes in the means and ways they use to achieve that goal. Anticipating and planning for the future is the main concern which can be expressed as: A good quality of future life (ends) can be partially secured through acquiring learning as a qualification or knowledge base (means). Everyday learning in the classroom is the pathway (ways) for gradually achieving becoming qualified adults and/or professionals.

Nasatya's strategy for learning is indicative of his strategic prioritising and the clearest amongst pupils:

> Nasatya: [Learning means] that you can get a better grade and then the best job, so that you can have a great life when you are older. [I learn now] because you need to practice to get a job, if you just go to that job you won't know what you need to do, so, you have to learn and then get a job. [...] You have to pass through Primary school and then go to secondary school, so you have to go in order.
>
> P.M.: What do you gain by learning?

Nasatya: Maths and English, so you can get... so if you want to do a job that's all about maths you have to work really hard for maths, but if you have to work with English you have to learn English.

This process involves systematic projections of the learning self into a desired future, and then a retrojective adjustment of the current learning self into a course that will lead to this future. This has inherent motivational value to pupils, because it provides personal rationalisation and justification for sustained pursuit of learning. Yasar discusses the specific outcome he wishes his learning to have, and which my observations confirmed he was actively pursuing in the classroom:

Yasar: It makes you famous.

P.M.: How does it make you famous?

Yasar: Because, uh, Albert Einstein was very good at learning, and he was famous.

Lenora, Jade, Hani and Arnie are some of the pupils who rationalise their commitment to everyday learning, by stating their goal is to avoid struggling in more advanced levels of Education, or even later on this Year:

Lenora: Learning is... we have to come to school to learn, and we don't come to school just to have fun and have playtime or lunchtime. We come here to do maths, literacy, science and art so that when we are in a later school we will not be struggling with that stuff. So we kind of have an idea of what we've done in Primary school.

Jade: ... and when you're in the university and you haven't done any primary school and secondary school and you go there, you struggle, you'll struggle a lot to do your GCSEs and stuff.

P.M.: Ok. Why do day-by-day learning? Why learn every day?

Hani: So you get better at the stuff that you do. You build the skills to go to the next school.

Arnie: Because when you do learning you'll know different methods and when you grow up, if you don't know the methods, and the teacher asks you, you'll have to do that method. If you don't know, you won't know what method to do.

There are no fewer than 10 pupils, however, who explicitly discuss their goal-setting and motivational effort being centred on performance goals. Madison exemplifies:

P.M.: Interesting. Now, what are you trying to achieve by doing good learning?
Madison: A new target. A higher target.
P.M.: Target as in?
Madison: 3A, ...
P.M.: Grades?
Madison: mhm.

Although performance goals are generally a short term pursuit, they also showcase some pupils' decision to locate the ends of learning in a temporal continuum, rather than a general state of success in the future. Nevertheless, this differentiation does not change their focus on the ends of learning.

B.4.1.2 Learning as acquisition of valuable skills through practice (means)

The second most popular view of learning is one oriented towards gaining skills. Pupils discussed learning as a process aimed at acquiring skill and competence, with a view of anticipating the future in a non-certain way. To them, learning aims at becoming prepared to face indeterminate, but quite possibly complex situations in their future, and they do it with an aim of:

Amrita: building up their minds

and

Iris: gaining skills.

Through this understanding of goal setting and striving, pupils express a stronger affiliation with personal learning processes, which is also indicative of their understanding how everyday learning can lead them to achieve goals. Instead of expecting an accumulated effect of learning

in the far future, these pupils seem keener on improving the process of accumulation. Iris and Lara express that their personal learning goals are linked to creating an arsenal of tools for learning and understanding:

> Iris: I think learning is... learning is the only way you're going to be learning all the way through life.

> Lara: A goal so that you... so you can.... you'll be able to do... most things
> P.M.: Such as? What kind of things?
> Lara: To read, to understand numbers in different ways...

Strategically, this view privileges means over ends and ways. Learning is viewed as the practice on which pupils rely on to help them amass an arsenal of skills. Capacity building therefore is, in this view, more important than setting a specific goal for life, since:

> Iris: ...you never know what can happen in life!

An emphasis on means indicates a focus and striving towards the conquest of a range of methods and methodologies, which constitute reliable paths to learning. Pupils endorsing this view, which closely resembles a competency approach, also pay less notice to ways, for the same reason they do that for ends: there are too many. Ends, to these pupils belong in a hazy future, full of potential and challenges. Ways on the other hand, are in their experience ever-changing and adaptable, and are therefore too unstable a ground on which to base one's entire understanding of something as important as learning.

Although, however, these pupils view learning as a process of acquisition of valuable skills through practice, they seem reluctant to name specific skills, or project their value into their future. Instead, they maintain faith in that the practice and content of learning in the classroom is slowly but surely propelling them towards the exact variety of skills which their future selves can feel competent in. Kena explains:

> Kena: Yeah. If you need to get a job when you are older and you haven't learnt at school, when they look at your files from when you're in school and university and stuff, then they won't really want to have you, because you haven't been learning, you haven't been doing anything.

Specifically, seven pupils seem to regard subjects as skills, viewing literacy, for example, as a set of skills in itself. Others value the experience of building on challenge as a skill, like Carrie:

> Carrie: Each Year you're going, or each Stage you're going, it's like you're learning the same things, but you're learning different methods to figure it out. So the more you do it again and again, but more harder, it will help you when you're older.

This understanding of the iterative structure of curricula appears to have led Carrie to realise that it is more important to focus on skills than outcomes/ends. Her additional understanding of the incremental difficulty of the knowledge provided to her leads her to project a very difficult future which she has to prepare for by catering to those of her skills which will cover knowledge gaps.

B.4.1.3 Learning as the process of complying with classroom practice (ways)

Most pupils predominantly discuss learning as 'something that has to be done', the activities and processes in the classroom. These 12 pupils seem to experience learning as a series or pattern of events, and focus on the specific steps of this process which lead towards, or possibly themselves constitute through their observance, learning. Lenora and Madison discuss:

> Lenora: It's when you read, write, or when you see numbers and then you have to add them all together to get answers... we do handwriting, science...
>
> P.M.: What is learning? You say you learn more than at home so what is it? What are you doing?
>
> Madison: You're doing more learning and working, and it's like homework, but it's in school. So when you're at home, you only get a few pieces of paper, but when you're at school you get loads of papers, and you learn more.

These pupils seem to direct their understanding towards describing and becoming part of the modus operandi of the classroom. An overall aim could be interpreted to be that of participation in norms, which, in themselves are these pupils' way of benefitting from classroom

learning. Pupils recognise the value of participating and learning certain norms, which they believe are valid even outside the classroom. Rhonda explains what learning is:

> Rhonda: When you write reports or something, or education, for instance, like numeracy or literacy or maths.

Knowing how to complete tasks and being sensitised to learning subjects has double value: it is learned in the classroom, and will remain useful even outside of it. Along the same lines, these ways also accrue value when happening outside the classroom by people not involved with classroom learning:

> Carrie: So if I was a baby, a toddler, and I was just scribbling, it's still learning, because you're just scribbling anything, but you can still make letters.

This view showcases how Carrie filters practices and actions external to the classroom, and assigns value to them depending on their potential use in the classroom. An understanding of the way in which the classroom operates and the way in which pupils operate within it appears to impact the way in which Carrie appraises her life outside the classroom.

B.4.2 Learning as (im)proving oneself in response to oneself or others

Additionally to explaining how different conceptions of learning drive pupils' approach to pursuing learning, pupils also discussed motivation as a force for change. Realisation that their way of doing learning or their attitude towards it is not helpful usually leads them to making changes. All pupils discussed choosing to change, and two major views emerged: 15 pupils tend to decide to improve their learning in response to other peoples' prompts, and only seven in response to their own appraisals.

Interestingly, all pupils discuss improving themselves as learners and their understanding of learning by facing it as a challenge. Aside from their improving learning as a response to someone, there is an added element of proving their worth to themselves or to others. This attitude pupils expressed is closely linked to motivation, since it alludes to their understanding of a classroom in which visible learning and performance are highly appreciated if not encouraged.

B.4.2.1 Improving learning in response to others

When discussing their rationales for making changes in their learning, most pupils suggested being prompted to change by others. Although these 'others' vary for each pupil, the implications of changing to conform to someone else's idea of improvement remain the same. Most pupils express viewing other's demands for change as a form of signposting, which could help redress their attitude and actions to a more acceptable or advanced form. Lara and David describe:

> P.M.: Has anything happened in your learning journeys so far that made you choose to change the way you learn?
>
> Lara: When the teacher tells me something and it's wrong, so, I try to change it to make it better
>
> P.M.: So every time someone tells you to do something in a different way, you learn?
>
> Lara: No. I try to make it better and change it.
>
> David: Once I did my learning and my teacher said I need to change some things, and then I changed it, and my teacher was very happy with my learning.
>
> P.M.: How did that change your thinking?
>
> David: I said that I'm going to use that method and not the other method I'm not confident with.
>
> Lara: Also, when I do some method and I do it in one big... and then Miss comes and then it's wrong because it's too much because I try to do it in big ideas. Then she breaks it up for me and then I change it, so it's not that wrong. So then I break it into little...

Pupils conflate being given feedback on their learning and leading change in their own learning. Maintaining the delicate balance between conforming and being in full command of one's own learning appears in such cases to favour conforming to feedback. Some pupils, more than others, are comfortable letting the teacher, or knowledgeable others feed back or forward to them. Caleb is consistent in his description of where change and improvement come from:

> Caleb: If we have a question, and we don't know it, and we're at home, and we come to school and we have the same question, we'll have to do it in our books, and work it out, and you're going to say the answer. So when you come back home,

then you can tell your parents ' I know what the answer is because we've been doing it at school'.

P.M.: So do you have questions at home because your parents ask you, or do you have questions because you think them up yourself?

Caleb: Because my parents ask.

The request prompting change does not, however, need to be spoken or made explicit. A powerful example is pupils responding to what they believe their teacher expects of them. Pleasing the teacher is a very common concern amongst pupils, who are concerned with satisfying demands before they are made, through comparison with peers and objective grade criteria they next need to achieve. Rhonda explains:

P.M.: Did you change anything in the way you learn?

Rhonda: My methods. Because if you do the same method, and Miss T sees us doing a good number line, we understand the number line. And then we can go on to another level, another method.

P.M.: What did you decide to do about that, then?

Rhonda: I decided to do the grid method now.

Madison also adds the social rules delineating pupils' response to the teacher's authority:

Madison: [...] it means to me that you should always try your best and not give up, because the teachers are always doing good things for your learning.

Madison: [...] they shouldn't have ignored the green bubble that the teacher's given them, and they should do it and check it all over again. Don't ignore the teacher, that's rude.

Such views of following advice on principle can further enforce views that learning is to be done as a response to others' requests. This understanding, also shared with seven of Madison's peers although to a lesser extent, appears to be reflected on these pupils' preference for teacher instead of peer feedback, and for more frequent demand for it. Sustaining motivation therefore tends to happen for these pupils through frequent feedback from knowledgeable and respected others.

B.4.2.2 Improving learning in response to oneself.

Motivation for improving or changing learning can also happen as a response to personal prompts. By rationalising why certain aspects of their learning and knowing need to be improved, ten pupils discussed learning as a process akin to answering their own questions about learning. Although this process is not completely individual and internal, and external prompts are often used, pupils who generate their own course for improvement express being more independent and needing less frequent reinforcement and encouragement by knowledgeable others.

The disposition of questioning and growing appears to be sustainable exactly because it has become rationalised, and the projected benefits are a good fit for pupils' understanding of how the classroom works. For example, Kena suggests that answering her own questions is important in situations in which knowledgeable others cannot help:

> Kena: Because if you don't learn, then you want to know something for yourself, and then if there's no one around you to help you and you haven't gone to school, then you won't be able to answer those questions that you've always wanted to know.

And Hani suggests that asking multi-focus questions paves his way to learning:

> P.M.: So you see something new. How are you going to learn about it?
> Hani: How to use them.
> P.M.: So you ask questions about it?
> Hani: Yeah.
> P.M.: What kind of questions would you ask about it?
> Hani: Curious questions

The issue of self-direction and of taking responsibility for one's own learning is encapsulated in Lara's words:

Lara: It's when you teach yourself something, so you are learning how to do something.

She feels motivated to take charge of her own learning and finding it is of primary importance in comparison to being taught by others. That is not to mean that she, or other pupils sharing her view, ignore the teacher's efforts, but that personal involvement and self-guidance through learning should be a consistent undercurrent supporting learning in the classroom. Directing oneself through learning also allows pupils with specific knowledge deficits to focus on those aspects of classroom learning that will allow them to counterbalance those. Elizabeth proposes:

Elizabeth: Maybe learning is learning new words?

As an EAL pupil, Elizabeth decides what her learning is directed towards, and is a response to her own question about how to achieve improvement in Literacy and comprehension, a concern highly evident in her entire interview.

Last but not least, the attitude 15 pupils expressed when discussing using motivation to support their individually chosen learning was that of convincing and encouraging themselves through internal dialogue. These pupils appear to derive the strength and conviction required for answering their own questions through telling themselves they can do it, as opposed to the pupils discussed in the previous segment, who seek frequent encouragement from significant others. Connie describes:

Connie: I always tell my mind 'I can do it, I can do it' and I try my best to do it because I am in a school and I will do it because I want to do it'.

The issue of motivation appears to be very significant to pupils' understanding of learning both as a personal and as a classroom function. Who pupils want to be as learners and the manner in which they pursue and sustain motivation to achieve it are changeable, and long term goals seem to change with them. Motivational efforts to sustain these changeable goals are also adapted to situations e.g. in which higher support is needed, but overall appear to allude to more solid dispositions for doing learning. Pupils' choice of supporting and motivating themselves through goal setting and goal striving appears therefore to point towards a process of balancing, or strategically regulating, their expectations for their future learning self and the support that will potentially be made available to them to support these expectations.

Regardless of whether pupils plan for high or low challenge for themselves and combine that with an expectation of high or low support from their future context of learning, they appear to model and make predictions on the outcomes of that plan based on how effective it is or could be in their current classroom and school. Sample pupils did not state a mass endorsement of one plan or balance over others, which indicates that the classroom does not openly favour one such balance or directly promote it to learners. Instead, pupils appear to follow individually devised and rationalised plans for achieving who they want to be in future contexts of learning.

B.5 Regulation: Decision making - using the context

The process of learning appears to be replete with making choices: choosing who the learning self is or could be, where the locus of learning lies, what the goals of learning are or should be, and how they can be achieved in the classroom or beyond. This constant effort made to guide one's own learning is not, however, arbitrary. Learning in the classroom through all the specific affordances and constraints it encapsulates, as seen in all previous segments, presents pupils with a frame of reference, against which all choices are considered.

Choice making can be experienced as a routine, especially in highly regulated environments. Pupils discuss making choices without realising that an alternative course of action could be realised within the very same classroom. The combination, therefore, of a regulated learning environment and pupils' understanding of learning as a pre-approved and one-way course of actions, attitudes and events can lead them to not realise they are making choices regarding their own learning. Oppositely, pupils with a tendency to test the limits of their autonomy in the classroom by trying to conciliate their own demands for learning with those of the classroom, appear to discuss making choices as a more consciously done, deliberate process. The difference between the two attitudes is evident in pupils' rationalisation of choice. The few pupils (five) who discuss learning as a process that doesn't involve personal choice tend to discuss their learning as undifferentiated from that of the classroom, providing little to no rationalisation for why that happens. On the other hand, the rest of the pupils rationalise their choices through a process of comparing what ought to be done (classroom norms) and what can be done (personal goals and competence).

Pupils regulate their learning by taking autonomous action to direct it, while factoring in whether they are allowed to do so, and what the consequences will be for their further learning. Pupils pursue regulation with the classroom on two levels: the social and the physical environment of the classroom. The social environment of the classroom is the frame of reference which expresses norms, affordances and constraints, and the physical environment of the classroom is the frame of reference which secondarily expresses norms, affordances and constraints through artefacts.

Therefore regulation with the two levels of the frame of reference constitutes an effort to follow the signposting made available in order to successfully relate with the context of learning, and thus achieve personal learning advances.

B.5.1 Making decisions

As discussed in section B.4, the will to change and improve one's own learning is actualised through decision making and subsequent executive control or action. Pupils in the context of the classroom make decisions relevant both to autonomy and the execution of classroom mandates. Interestingly, pupils discussed actively making decisions during specific times and for specific purposes when learning in the classroom. Although decision making can be viewed as a personal initiative, the fact that pupils collectively produce descriptions of when during and why decision making becomes necessary during classroom learning denotes the existence and apperception of a choice architecture.

My interpretation of pupils' regulation (as an effort of relating) with their context through decision making is that it is simultaneously relevant to cognition, affect and motivation. Therefore regulation presented as decision making will be highlighted in pupils' discussions on how they think, how they feel, and how they support themselves through learning in the classroom.

B.5.1.1 Directing oneself to learn

Pupils discuss regulatory self-direction as a process of control and adjustment of their personal learning to classroom demands. There are two crucial ways in which pupils purposefully and actively direct themselves to learning, motivation and rectification-adjustment.

Although, as discussed in segment B.4, pupils are not capable of explaining exactly why self-direction has motivational value, they seem to activate this process of self-support in instances when their sense of competence/confidence is challenged. Motivating themselves through self-direction helps pupils to concentrate on their work in a way that satisfies them and conforms to classroom criteria. Madison offers a description of such a process:

P.M.: Ok. Interesting. How does talking to yourself help you? What does it offer you?

Madison: It makes you feel like you can do it, you've got the strength and the power to do it, so then you get on with your work. Before you know it, everything's done and you did alright. So it can help you by saying something in your mind.

To her, and many more pupils, the idea of motivating themselves is linked to making a second, more successful effort to face challenging learning in a way that is congruent with classroom standards, the most frequently listed ones being time-effectiveness and having a correct answer. This view of regulatory self-direction functioning as a 'second chance' mechanism activated at will is also expressed by Connie:

Connie: Sometimes when I talk and I forget about getting started, I get started again by thinking that 'I can do it'

An important element arising from pupils' interviews is their choice of timing or occasion suitable for making decisions. As discussed before, a decision can lead both to the actualisation of a personal initiative, as well as to the execution of a choice compliant with classroom mandates. The temporal dimension becomes significant when linked to the issue of frequency of experience on a matter.

The act of making a decision is in itself a form of sense-making, because it requires making judgements on the affordances and constraints imposed by the context. In this classroom, which constitutes a regulated environment, replete with norms, processes, and rites, pupils discuss taking an active stance towards more autonomous decision making when faced with solving problems. Lara explains:

P.M.: What kind of thinking would you do to solve the problem?
Lara: I would try to put my ideas together, and...
P.M.: How would you do that?
Lara: because, if I have two, then I can put them together so it can be a better plan.
P.M.: How do you put ideas together?
Lara: Like, if there was a tiger in the school, you would try to get everybody out. But, if you had another idea or if you are too slow, then you can...
P.M.: You try to find a solution with a lot of ideas instead of just one?
Lara: Mhm. So if that one doesn't work...

P.M.: You have a plan B?

Lara: Yes.

Lara has constructed the view that decision making needs to be timely, versatile and adaptable, and to serve practical needs that might arise in her learning. Some concern for planning for problem solving in the classroom is traceable in 17 pupils' responses, and is indicative of pupils' will to overcome situations in which either knowledge, confidence, or resources are lacking, and inventive, imaginative restructuring of one's thinking is required. David's solution reflects the common attitude of preplanning for decision making, by following a classroom mandate: collaboration. His rationalisation also follows the standards of time-effectiveness and correct outcome, as previously seen in Connie's answer:

David: You could ... if somebody else had an idea, and you had an idea, they could tell you and you could make something that would work.

Regulating the self with the classroom does not, however, solely happen by endorsing and following models, behaviours and routines. Once again, the influence of the learning attributes becomes apparent as a medium for alignment with classroom culture and norms. To Madison, the influence and value of these attributes is so potent, that she uses them in her extracurricular decision making:

Madison: I asked my mum when I'm going to do all the thing I need to do, and she said she'd make a chart. But then I self-regulated myself.

P.M.: Why did you decide that?

Madison: Because it's better to do than wait for things that you want to do, so you should self-regulate yourself and...do the things.

It is important at this point to stress that in all previous examples, pupils activate decision making functions or personal protocols to resolve a problematic situation. However, not all occasions of learning give rise to problematisation, nor consideration of alternative courses of thought and action. All pupils did at different times discuss situations in which they personally felt they did not have to make choices, and so following a routine was their implicit choice.

Remarkably, nine pupils discuss decision making without actually having an active stance towards making choices. Once sense has been made of an occasion, a task, or a context, active effort towards regulation and decision making are allayed. Instead, it becomes replaced by routine re-application of previously successful sense/decision and results in reifying the learner's previous choices. Olutomi exemplifies decision making understood as reapplication of successful previous choices:

> How do you pick a method?
> Olutomi: You do the one you're most confident with
> P.M.: And then what do you do about it?
> Olutomi: I add the numbers together and then they'll make your answer.

His decision making here is limited to subscribing to a choice made in and by the classroom at some point. Olutomi, like others, chooses to follow procedures which, when originally introduced, were presented with an internal rationale for the choice structure they include, e.g. which problems require the use of the operation of addition. However, everyday routine has led Olutomi to forget these choices, since overt rationalisation is not required or reiterated in everyday learning. Instead, slipping into habitual thinking and acting is likely to happen without realisation or rationalisation.

B.5.2 Using the social and physical environment of the classroom

Pupils regulate internally with their own dispositions and goals, and also regulate externally by conciliating and aligning their dispositions and goals to the social and physical environment of the classroom. In their discussions on learning in the classroom, all pupils suggested that their most active interaction with the classroom was for purposes of regulation, which is understood here as getting help with their learning in occasions when they feel stuck with their thinking. The social and physical environment of the classroom is viewed as a framework of reference and support, which guides pupils in their decision-making.

Sara eloquently presents the majority of pupils' (18) differentiation of use between the social and the physical environment of the classroom:

Sara: Objects in our class help us, because we actually have to do something with them. People do something: they talk to us and try and help us, and object in our class, we have to do something.

The needs of the pupil seeking help and the resources and people available to help them are used differently by each pupil, since their needs are unique. In their interviews, pupils described their interactions with their peers and use of objects in their classroom through discussing the nature of help they want, how they act to get it, where they seek it from, and why.

Help seeking is one of the primary concerns of pupils, and a significant aspect of their learning, which is structured in stages of challenge and confidence. Realising help is needed is the first step of a process that appears to also be standardised. Rhonda describes:

P.M.: What can someone do when they get stuck with their learning?

Rhonda: Ask for help.

P.M.: Is that the first thing you do?

Rhonda: Yeah. Sometimes. If we're doing a test paper we can't ask for help, we have to do some jot-ins on our paper. And if we're in normal maths, if we get stuck on hundreds, then we'll ask for help, then Miss Twill come over and say 'what's the problem'.

P.M.: What kind of thinking do you do? You think 'oh, I'm stuck now'. What do you do next?

Rhonda: Put our hand up.

Even though the sources of help are specific, other pupils rationalise seeking help by prioritising their requests. Pupils' rationales reflect the trust projected on to the prospective help provider, observance of the social norm of respect, and the learning attributes independence and collaboration. Application and adherence to the principles represented by either independence or confidence are mediated through evaluations of the degree of personal competence. An honest evaluation of that, according to Amrita, ought to be the basis on which help-seeking (collaboration) or perseverance (independence) is considered:

Amrita: To persevere and not give up, and if I really really need help, I just ask my teacher and she will explain to me, and if I still don't understand, she or he will tell me what to do.

There is, however, a variety of subsequent sequences of actions pupils can follow after making that judgement. Connie, Yasar, and Amrita discuss the most common ones:

Connie: When I'm stuck and ask the other person and they're carrying on with their work, then you ask the teacher.

P.M.: What can someone do when they get stuck with their learning?
Yasar: Ask the teacher
Amrita: Or if the teacher has gone to the toilet, all the teachers,...
Yasar: Ask your friend.

Notwithstanding the variances in rationalization, all pupils who discussed needing help, expressed wanting it to achieve better understanding. Elizabeth and Hani, who are both ESL pupils, describe in detail the help required for doing good learning:

P.M.: Can you tell me what the best way is for someone to learn?
Elizabeth: Helping them?
P.M.: So in your experience, what is the best way to learn?
Elizabeth: By explaining what to do.
P.M.: To learn you need someone to explain things to you?
Elizabeth: *nods*
P.M.: What kind of explaining should they do?
...
Hani: Good and clear, so you can understand.
Elizabeth:*In clear voices*
P.M.: What kind of understanding would you need to do?
Hani: A person who can explain it perfectly
P.M.: When you say perfectly, what do you mean?
Elizabeth: They should listen to you, and understand, and try their best to do the same thing.

Elizabeth's view is especially clear in delineating that help should operate as a transaction of understanding, in a safe and well-articulated channel of communication.

Furthermore, pupils also discuss the overall rationale for achieving personal understanding through interpersonal communication. Pupils find help with understanding will lead them to constructing the answer, and by extension knowledge, by themselves, in anticipation of needing to show the teacher, or anyone else that they do indeed know and hold individual ownership of their knowledge. David and Lara explain:

P.M.: Ok, what kind of help would you want if you're stuck?

Lara: Somebody to go through the question with you...

P.M.: Talk me through it. How do you talk someone through the question?

Lara: if it's a question on math, they would get a whiteboard and write it down, and they would help you by doing it step by step.

P.M.: So they would show you how to do it?

Lara: *nods*

P.M.: Ok, so they break down the task, what else?

David: They could help you with the method, but not tell you the answer. And when you think that you've almost found out the answer, you could turn to them and tell them ' I don't need your help anymore' and then they'll stop.

P.M.: Is it important that you know how to do the method by yourself?

David and Lara: Yes.

David:... because if they're just telling you the answers, the next time the teacher tells you to do it on your own, you won't know what to do.

Kena concurs with this view, and discusses a hypothetical, but not unlikely situation in which help seeking is regulated against classroom practices and demands, and adapted accordingly:

Kena: Well, if you're in a classroom and there's teachers, you could ask them. If it's like, in a test, and they're not allowed to tell you the answer, if you don't understand the question you could, ask them for help with the question, so that you can understand the question and then think of the answer.

P.M.: What kind of help would you need? What would you want someone to help you with?

Kena: If there's a question that you don't know, and it's in a test and people are only allowed to help you and they're around you, if you don't understand the question, you could ask them for help with that, and then you could gain your own progress.

The clarity in which pupils reject being given an answer is clear in all their answers. I was led to understand by most of them that getting help but not answers is an unspoken classroom rule, although none of them described it as such. It appears that help and answers are part of the guiding principles of the learning attributes of collaboration and independence, which pupils also take into account when seeking help. What they want, in other words, depends on how they are set to work. Lara describes:

P.M.: Why not just give you the answer?

Lara: then they're not learning [collaborating peers], they're just giving you the answer. And if they give you the answer, you won't know how to do the method, because you don't know how to do it by yourself.

This view is also expressed by Yasar and Amrita, who describe a common experience in which being given an answer is unhelpful:

Amrita: If you know the answer and there's someone there and they always shout out the answer, but the teacher doesn't tell him off, it affects my learning.

P.M.: How does it affect it? You don't want to do any more learning?

Amrita: I understand, but if I go away and don't understand because of that person's answers, I'm the one who's going to be in trouble.

All the above rationalisations reflect the way in which help is modelled to pupils and experienced by them in the classroom. When describing how help should be provided to them, pupils discuss the ways in which the teacher does it, through suggesting a specific method or providing pupils with hints and guide them to the answer. Arnie states:

Arnie: You can ask the teacher, and if they don't tell you the answer, they will tell you what thing you need to do, and when you do that method, you understand. So when you do another challenge, you'll know what to do.

There does therefore seem to exist a form of help seeking and help-giving that is approved and used by the teacher. In their individual efforts, pupils refer to that practice/model and imitate it or follow it. My interpretation is that pupils most likely build on the assumption that since this model of help with learning is provided by the same authority which also provides challenges, it ought to constitute a creditable pathway towards finding answers.

By extension of the same rationale, all objects, resources, and materials in the classroom, be it they were made in the classroom (e.g. poster displays) or only used in it, derive their value by being chosen by the teacher to be there. The majority of pupils who discussed using objects in the classroom (16), stated doing so for two reasons: either people were not available, or they wished to maintain their adherence to the attribute of independence, and perchance appear more knowledgeable to others by not openly stating their need for help. Kena suggests:

> Kena: Well, if you want to be your own person and not want to be asking people for help, then you can look around and see things that could help

Pupils' keenness on appearing and subsequently becoming independent is rationalised and operationalised as a bidirectional sequence of actions. Some pupils start by seeking help from others and build their way towards being independent and relying more on objects, while others are more keen to make use of resources and only if they still have not resolved their problem, request help from others. Hani and Elizabeth are an example of the latter choice of action:

> Hani: Use things in the classroom.
> Elizabeth: Or either you can ask people in the classroom to help you as well.
> P.M.: When would you talk to people?
> Elizabeth: When you're really stuck.
> P.M.: Yeah.
> Elizabeth:... and you can't do it anymore. If you look around the classroom and it still doesn't help you, you can ask someone, they might know.
> P.M.: So first you look at things, and if that doesn't help, then you ask people.
> Both: yeah

This distinction is probably made after judgements of confidence, or self-competence. In tasks, or even entire subjects in which pupils feel more confident, they appear to be more likely to

want to be independent, or to demonstrate independence by consulting material resources. In cases where their belief in their competence is confirmed and justified (e.g. through grades or teacher feedback), pupils appear to revert to material resources for help to achieve minor adjustments and verifications in their learning and work, both for reasons of time efficiency and for demonstrating having conquered the given object of learning in its entirety, with no gaps in knowledge that could possibly lead to a lower grade, or negative consequences like having to repeat work guided by formative feedback.

Displays were by far the most frequently referenced material resource used by students to get help and regulate with classroom learning. Elizabeth describes:

> Elizabeth: You look around the classroom.
> P.M.: Anything specific?
> Elizabeth: Things on the wall. There are adverbs and there's lots of things to help you.
> P.M.: How do these help you? You look at them, and what do they do for you?
> Elizabeth: They give you more ideas.

Elizabeth appreciates the displays for offering her a wider range of word choices to use in her writing. Connie, on the other hand, like most of her peers, finds the displays are an easy way to verify intermediate steps of complex operations:

> Connie: Sometimes when we do dividing, I don't know if we still have it, but we had it on the display, a little chart that tells you your timestables. So sometimes when I'm dividing and adding on six, my six timestables, I quickly check if that's right. And if it's the right answer I leave it and move to the next one.

Time efficiency is of the essence when working on lengthy and complicated tasks, like division. Time efficiency is also to be considered when, for reasons of politeness, help is not immediately available. Madison states:

> Madison: Sometimes when people are really concentrating in their work, I don't disturb them, I ask Miss T if I could use some deans, or objects that can help you with your learning.

Surprisingly, the learning attribute puppets, each representing a learning attribute, was only

mentioned by five pupils. David and Lara were two of them:

P.M.: Are there any other objects in the classroom that you use to move your learning forward?

...

David: The puppets. Because they tell you that you need to self-regulate, put effort into your work, ...

P.M.: How do you use them to help your learning?

Lara: Because when you look at them, it reminds you...how to do.... the...

P.M.: Attributes?

Both: Yes.

Needing a material prompt or reminder for implementing the learning attributes in their work appears to be unnecessary for most pupils. A likely explanation for this is the frequent use of these attributes in the language and code of communication of the classroom. Since these principles are so often discussed as being intertwined with all learning and task-completion activities, it is likely that pupils bear them in mind without having to also refer to the usual prompts. That having been said, all five pupils who discussed using the puppets alluded to using them as motivational rather than informational support. In other words pupils looked at puppets not to remember which the learning attributes are, but to select the most appropriate principles the implementation of which could enhance the quality of their learning and task output.

B.5.3 Interpreting feedback/assessment

Predominantly teacher, and secondarily peer feedback appear to have a very important and highly influential role both in communicating the framework of reference through attributes, principles, affordances and constraints, as well as in providing pupils with a linguistic and conceptual platform on which to model and construct their own understandings of learning and themselves as learners.

Pupils appear to be comfortable and dexterous in communicating with the framework of reference by responding to the demands posed on them in a congruent, acceptable manner. At the same time, pupils also gain insights on who they are as learners, through gaining feedback

on their limitations and comparing it to their self-perception. Since, however, classroom feedback is given by a more creditable source than themselves (the teacher, or more than one peer), it usually has greater impact on the pupil's perception of themselves as a learner, and in most cases leads them to adjust themselves to the requests, or the view others hold of them as a learner.

Through time and consistency in feedback form, manner, and time of provision, pupils appear to produce statements of ipsative feedback in the same form modelled by the classroom. Such pupils appear to have internalised the framework of reference, and, to an extent, now play a part in reinforcing and reproducing it. Both through adjusting who they are as learners and their personal learning process, and feeding back that adjusted self and process into the classroom, pupils then become active proponents of the framework to their peers and to themselves. The consistency of their experience constitutes further validation of the framework, as does the empowerment derived from having congruent views and manners of expression with the framework of reference.

B.5.3.1 Interpreting feedback/assessment

As described in segment A.1.3, both formative and summative feedback are an essential part of pupils' everyday experience of learning. The role of feedback in guiding and shaping pupils' understanding of themselves as learners and their learning is often regulatory, because it often is perceived as either a mark that further effort and adjustment are required, or that confidence has been achieved.

For the learner seeking cues for improving and adjusting themselves and their learning, all feedback constitutes a form of assessment, be it formative or summative. For those pupils with a strong and continuous will for adjustment or improvement, making sense of feedback sustains the process of change. However, for those pupils with a strong orientation towards achievement viewed as an end, assessment and sense-making appear to be competitive and conflicting functions,

For result-minded individuals, receiving a grade (summative) is likely to be interpreted as the teacher confirming they have achieved the descriptive criteria linked to said grade/level. Caleb here asserts that his better grades gave him an insight into how he learns in the classroom, and

not the other way around. To him, making sense of himself as a learner in the classroom is a function of secondary importance to receiving and considering others' sense-making of him. Understanding himself as a learner is viewed more as an externally gifted than an internally constructed realisation. Caleb, Rhonda, and Arnie further illustrate the same point:

> Caleb: When I heard my grades moved up to 3a, I was really excited.
>
> P.M.: Why?
>
> Caleb: Because that means that when I'm learning, I'm concentrating, and not talking to other people and I'm getting good grades.

> Rhonda: Because if you do the same method, and Miss Tsees us doing a good numberline, we understand the numberline.

> Arnie: [...] you have to do the method you're most confident with.
>
> P.M.: How did you decide that?
>
> Rhonda: Miss T gave us levels.

Pupils looking to make sense of feedback to regulate their learning process and selves and adjust them according to the demands of the regulatory framework of the classroom, state that they are not limited to feedback in the form of a grade, or a green bubble reminder of methods. Pupils also gauge regulatory feedback in others' cues of social and emotional affirmation and recognition, which constitute indirect signposting guiding their learning journey. David is one of the 13 pupils who discuss the importance placed on interpreting the teacher's stance and feedback in terms of approval of their learning self and their learning progress:

> David: Good learning is if you do something and you're trying your best, and your teacher says that your best is enough, and the teacher is very proud of you.

> P.M.: So what's the feeling you associate with good learning?
>
> David: [...] when your teacher marks it she can tell you've done good learning, because your learning has done enough.

Secondarily to the indirect communication of approval or demand for further adjustment through feedback, pupils discuss being offered or denied material rewards, or privileges. Arnie describes his understanding of this more direct form of regulatory feedback:

> Arnie: Sometimes when we do good, focused learning, Miss T might give us treats and we feel proud of ourselves because we did excellent learning.

This post hoc sense-making of a reward having necessarily been given as a result of 'excellent learning' is a further prompt for pupils to reflect on what 'excellent learning' actually means, and making a decision to repeat the manner in which they apply themselves to learning in the future. However, in cases of punitive action and the withdrawal of privileges, pupils appear less eager to reflect on unsuccessful learning, but rather more keen to take action to avoid it if they can. Carrie explains:

> Carrie: You know you're going to miss your playtime and you know you're going to miss your lunchtime. You have to do your learning and focus, and then... because there's a consequence if you don't do your learning. There's always a consequence if you do something wrong.

Although there is sense-making involved in reaching the conclusion that 'there is always a consequence', her stance is one of looking to avoid failure in the future rather than unravelling the causes of the failure, which she indirectly attributes to deficient implementation of the learning attribute focus. Additional consideration of the lenient and encouraging classroom attitude towards mistakes can lead to the interpretation of pupils playing less attention to linking the withdrawal to privileges with unsuccessful learning or performance. Although no pupils discussed this explicitly, their willingness to consider future learning without persistently dwelling on past mistakes seems to indicate their optimism and faith in their ability to improve and overcome. Pupils, therefore, appear to interpret feedback on their process and learning self in a manner regulated with classroom mandates and attitudes, which helps them reflect on the experience of learning while also protecting their self-esteem by disallowing and preventing potential situations of wallowing in feedback communicating failure.

B.5.3.2 Producing judgements of competence modelled on classroom feedback

As discussed in the introduction of this segment, pupils are not only passive recipients of feedback on their learning process and self, but also exhibit a tendency of producing statements of ipsative evaluation and assessment modelled on classroom feedback. Reflection on experiences of successful learning, as previously discussed, gives pupils access to a platform of language and values on which to construct and express judgements of competence/confidence, and thereon to strategise achieving an improved learning self.

The positive feedback and assessment on successful experiences on which pupils tend to reflect does not, once again, need to be summative or formal. Subtle, informal feedback on what they have done well in their learning process or output allows pupils to model their own statements of personal success on it, both in form and content. It is important here to underscore again that classroom feedback also includes peer feedback. Since, as previously discussed, the regulatory framework is also communicated between enculturated peers, informal discussions about learning are as likely to constitute a secondary platform for feedback provision and collective sense-making. Such informal conversations can also happen outside the classroom, as Amrita says, and sustain pupils' efforts to ascertain their level of competence and need for adjustment:

> Amrita: about my learning. If I get bored in the playground, I always go to them and say 'come on, let's go and speak about learning' and sometimes, if we ask question to each other...

In more or less direct ways, 20 pupils included statements reflecting the influence of classroom feedback on their judgements of personal competence. Lara's understanding of successful learning results in the production of judgements of competence derived from feelings:

> Lara: When you're proud of what you've done.

Arnie's judgements of competence are strongly based on being able to communicate his achievements to showcase his advances in cognition:

> P.M.: ok, so what's the best learning you can do, do you think?

Arnie: You can explain it

P.M.: Oh, so if you can explain something, you know it very well?

Arnie: nods

And Connie's judgements of competence are products of her experiencing and making sense of the somatised effects of her learning:

> Connie: You start really really thinking. And sometimes your brain starts hurting. Sometimes that means that you've worked really really hard, you made so much effort, so much thinking about it.

Although the aspects of their learning experience pupils make sense of in order to produce judgments are different for each of them, the basis on which all judgments are produced is consistently is the pupils' personal level of confidence/competence.

B. SYNTHESIS- INTERPRETATION

This section is my own analysis- interpretation of pupils' making sense of their own learning as it happens in the classroom. Although based on the sample pupils' rationalisations, this is a researcher's account entailing scientific description of said rationalisations, and highlighting links to existing theory on metalearning.

i. What do pupils know about how they learn in the classroom?

When prompted to discuss how they learn in their classroom, pupils provided accounts and stories, which they felt best represented the sum of their experiences of learning in the classroom. The researcher therefore is allowed access to the sense pupils have made of their own experience (learning) in a context (classroom) through accounts the participants themselves offer as representative of that experience.

More specifically, pupils' individual metalearning is traceable in the fact that they choose to mention specific, meaningful information about their learning. This individual ownership of meaning is understood by the fact that each pupil emphasizes different aspects of their experience in their answers, and allocates different attributes and importance to each. Once again, it is important to emphasize that the individuality leading to a wider variety in the meaning made and expressed in pupils' interviews stems from my research interest. I am not interested in what pupils know about learning (e.g. theories of knowledge and pedagogy). I am predominantly interested in what they know about themselves in relation to learning.

In these accounts, pupils discuss congruent, yet disjointed aspects of their experience, which, in their view, depict who they are as a learner and how they experience learning. This sum of descriptions makes visible pupils' knowing about learning. Their interlocutor and I, the researcher, are allowed access to an imprint, or a static picture of the speaker's past metalearning. The sum of a pupil's statements of representative aspects of their experience, guides the researcher towards the depiction of an overall learning blueprint of the pupil's diachronic metalearning, or knowledge about learning.

Analyzing this sum of significant, representative statements into distinct cycles of metalearning is impossible, because connections between experiences are mostly untraceable (either not

discussed by pupils, or unknown even to them). In spite of the missing connections, pupils' accounts of their experience are coherent, and shed light on distinctly different aspects of their experience and meaning making. In other words, the absence of a causal or temporal link between different aspects of experience describes does not signify fragmentation and lack of meaning; instead, the thread of meaning connecting all these different aspects of experience and rationalisations is the learning self.

Although an idealised notion of the learning self would be represented through a single, unbroken thread of meaning, interconnecting all aspects of learning deemed significant and representative, it is not accurate. Pupils discuss their learning self and their experience of learning as an amalgamation, or a collage of context-dependent learning selves.

A post-hoc reconstruction of the pupils' process of learning about one's own learning indicates that this mostly happens through the complementary functions of: inference/reference and reflection on experience/projection to the future. The guiding and bridging principle for pupils appears to be their knowledge of who they are as a learner at present. In their accounts of diachronic metalearning, pupils suggest that this knowledge is constituted through consideration of a pupil's understanding of their: level of competence (cognition regulated by context); feelings of belongingness (affect regulated by context); and locus of control moderating volition (motivation regulated by context).

Making sense of these facets of themselves learning in the classroom ultimately points towards a goal of becoming who they want to be as learners. Pupils appear therefore to include in reflective accounts of past learning, which are also histories of the development of their learning self, an underlying but long-standing focus on learning about learning. A hypothetical question exemplifying this focus could be worded as: 'How do I make sure my personal learning benefits from classroom learning?'

ii. Learning about learning experienced through interaction of person and context.

In their reflective accounts pupils discuss how they have been making sense of their own learning by discussing it as a version of what they perceive their classroom means learning to be like. Pupils, in that sense, discuss making sense of their own learning as a process that stems

from their making sense of how learning happens in the classroom. This process of interpretation and meaning making is one of cyclical connections of references and inferences. Pupils discuss being aware of specific features of their learning environment which are intentionally designed as cues or personally conceived as such (references), and from those appear to infer how they should adjust the course of their own learning accordingly (inferences). Finally, this process also influences how pupils become aware of their learning environment, potentially in a new, richer way, and constitutes the starting point of a new cycle of reference-inference approaches to context.

Personal constructions (awareness and sense-making) about learning appear to be the pupils' most verbalised mechanisms of interacting with the context of learning. Interaction, which emerges as a predominant goal might take the form of communication with the context or of adjustment to it. Pupils discuss being in a constant dialogic relation with the 'rules' constituting the community of people forming the classroom. While some of these messages are clear and set (e.g. resources, work settings etc), some others are also set, but open to personal interpretation (e.g. learning attributes).

Pupils, therefore, make continuous effort to regulate by balancing how they perceive applying themselves to learning and how the classroom would like them to learn. They describe adjusting (in various degrees) their goals, ways of applying themselves to learning, and manner of communicating with their context to a regulatory framework, in which they routinely experience learning.

According to pupils, signposting in that respect mostly happens through the regulatory medium of classroom language. It holds a double role of communicating the rules of classroom learning to pupils, while also providing the learners themselves with a platform for describing and making sense of their own learning. The regulatory influence of language is mostly evident through the black swan effect of its inexistence in pupils' discussions about affect alone. The disparity between pupils' discussions of affect and every other domain in their accounts (cognition, motivation, context) is sharpened by the fact that there is no prescribed way of talking (language) about feelings in the classroom, although there is for everything else.

iii. Metalearning strategy in accounts of diachronic metalearning

Pupils discussed making sense of how they have been learning so far through accounts that describe and explain how they apply themselves to learning, for what reasons, and to what aim. These non-definitive and open to being informed by new experiences ways pupils understand themselves to be using to apply themselves to learning can be viewed as metalearning strategies.

Strategy, as suggested in Chapter 3 is the balance between ends, ways, and means. Metalearning strategy that is made evident in learners' accounts of diachronic metalearning (Chapter 5) can be viewed as a regulatory balance between: who the learner wants their future learning self to be (ends); the optimal manner in which a learner can apply themselves to learning (ways), and the affordances and constraints the learner perceives their own capabilities and the context of learning to place upon them (means).

The mechanism for achieving that balance, regulation, constitutes an orchestration of these three components of a strategy through continuous consultation of and interaction with the social and physical context of learning, a tempering of the learner's wishes with the signposting their environment directs them to learn through.

Pupils' accounts on diachronic metalearning (knowing about how they (have been) learn(ing) in the classroom) showcase that pupils are aware of having moderately consistent, yet open-ended ways of applying themselves to learning in the classroom. The cornerstone of the learners' effort towards constructing, applying and improving their strategies appears to be the successful regulation of personal cognition, affect and motivation, and, at a second level, their mediation with the regulatory framework of the context of learning (the affordances and constraints the classroom places on their learning).

Chapter 6- RESULTS ON SYNCHRONIC METALEARNING

C. SUBJECT BASED LEARNING [Learning about learning in different subjects]

This section is dedicated to presenting pupils' descriptions of learning through subject-related tasks in the two core curricular subjects of Literacy and Mathematics. The specific parameters which pupils discuss as central in making each subject unique and different from the other are regarded as additional to those presented in the previous Chapter (section A). This signifies that pupils add or omit affordances and constraints in order to describe what learning in each subject is like, rather than re-describe the entire context. The aim of this segment is to draw on pupils descriptions of these sub-sets of affordances and constraints, in order to represent to what degree and why pupils perceive different subjects as different contexts.

This section addresses my main research question:

- How do pupils construct/activate/ experience metalearning as it occurs in specific learning environments?

by reconstructing, through pupils' descriptions, the 'specific learning environment' of learning in subjects in the classroom.

As in the section on pupils' descriptions of learning in the classroom, seeking objectivity is foregone in favour of identifying descriptions that are true by value of being representative of the experience of the person producing them. By implication, this section is not a description of Literacy and Mathematics epistemologies and pedagogies, but of the sense pupils make of their experience of learning Literacy and Mathematics in their classroom. This sense-making was targeted in the part of each lesson involving 'consolidation-expansion' tasks (Vis Methodology Chapter for description and justification).

This section also addresses all three research sub-questions in specific ways:

- RQ1a: What accounts do pupils construct of their metalearning as it happens in the context of their classroom? Building on from accounts of experiencing learning in the classroom, this section unravels a heightened specificity version of the context, which is now located in 'consolidation-expansion' tasks in the subjects of Literacy and Mathematics. Pupils' accounts of the process of making sense of the experience of learning (metalearning) are therefore attempts towards making sense of learning in that new context.
- RQ1b: Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do? Pupils construct their accounts of metalearning in the context of the subjects of Literacy and Mathematics by highlighting additional characteristics and regularities the more specific context imposes on their experience.
- RQ2: Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning? In this section, pupils describe which aspects of the physical and social context of the classroom when learning Literacy and Mathematics respectively are perceived as conveying what learning means.

C.1 Different subjects - different contexts?

My interest in how pupils develop and express their synchronic metalearning led me to focus on instances of learning in lessons of Literacy and Mathematics. This decision belied an expectation built when pupils discussed learning independently of specific subjects in their Initial interviews (Vis previous Chapter): that since pupils already used a broad frame of reference to describe and make sense of learning (the classroom), they could be expected to use learning in subjects as a secondary, more specific frame of reference. At the previous stage of being interviewed on making sense of past (undifferentiated in terms of subject) learning, seven sample pupils already discussed experiencing learning in each subject as being different and activating different dispositions in them. It appears, therefore, that for some pupils, adapting to known and alternating different contexts of learning (subjects) is seen as a constant feature of learning.

The integrated analysis of pupils' metalearning in the classroom and through subject-specific learning tasks further supported my previously stated expectation. Of the 13 pupils who discussed perceiving subjects as idiomorphic contexts of learning, five did so only when discussing making sense of past learning, four when only discussing making sense of current, subject-specific learning, and four in both occasions. While the remaining ten pupils of my sample did not make specific reference to experiencing subject specific learning being different from learning in the classroom in general, I can neither confirm nor question that they experience learning independently of contextual changes or shifts. I will therefore limit my analytical effort to the statements of the 13 pupils who directly addressed sensitivity to learning-in-context experiences.

In this segment, the statements reflecting how and why learning in each subject is different will be used to reconstruct a description of learning-in context (in what way learning in each subject is different). This is to be compiled through the use of pupils' statements of reference to the context/s, rather than statements of inference or interpretation of the context/s. Accessing that description can be supported by two guiding questions:

> What is unique in lessons of Literacy compared to lessons of Mathematics? and
> What can pupils afford to do in one subject that they cannot in the other?

Pupils describe learning in subjects through referencing what the rules of each subject are. By making these distinctions, pupils indicate the existence of two 'child' frames of reference actualised within and concurrently to the main one, that of the classroom. It is essential to note that the same affordances and constraints which apply to overall classroom learning also apply to lessons of Literacy and Mathematics, with added specific constraints and affordances for each subject-frame of reference.

The features of the frame of reference that appear significant to pupils are again discussed pupils as affordances and constraints. In particular, the two main fields of comparison are: subject related features, and lesson related features of subjects.

C.1.1 Subject related features

Pupils appear to perceive that Literacy and Mathematics uphold different views of personal and collective learning, which place demands on their everyday learning and work towards learning. Procedural rigour and internal logic, as well as creative freedom appear to be the main points of divergence between the two subjects.

Procedural rigour and internal logic

Pupils perceive Mathematics as favouring particular types of thinking, which are more specific and constrained in comparison to the ones they can use in Literacy. This can be linked to the existence of methods and their systematic application, as seen in the previous Chapter, through which learning is incrementally accomplished and furthered. Caleb gives an example of unsuitable, less structured thinking:

> Caleb: Guessing does not help in Mathematics, and my teacher will tell me to stop guessing.

Comparable remarks were not made for literacy by any pupils. This cannot be safely taken to mean that pupils do not associate a way of thinking with the subject, only that they do so less strongly.

Additionally to privileging specific ways of thinking, pupils perceive Mathematics to also be

more demanding in terms of application of skills, presentation, and exactitude. Madison believes that, to the extent that she believes it is the best type of learning:

P.M.: So what's the best learning you can do?
Madison: Maths.
P.M.: Why?
Madison: Because it helps you, it teaches you how to do different methods and how to do margins and straight lines, and everything.

It must be said here that although methods, margins, and straight lines are also applied in Literacy, they are less important, or just not the only way for reaching an answer. In Mathematics, however, exactitude paves the way to results, and thus achievement.

Another side to procedural rigour attributed to Mathematics is that of an internal logic, which allows for pupils to connect current to past knowledge, and anticipate the content of future lessons. It is quite easy for Jade, for example, to predict the next step-challenge in Mathematics:

P.M.: So you think this [accomplishing a task] is going to help you do more learning?
Jade: Yeah.
P.M.: What kind of learning?
Jade: Hard learning in maths. When our teacher tells us to work with placeholders after the units, I'll know what to say.

This internal logic and structure in Mathematics is seen, in fact, as such an integral part of the subject, that discontinuities in content are viewed as unexpected. Lara asserts:

Lara: Well, it's not the first time we've done shapes, but before we weren't doing any shapes, so it's so sudden that we started on shapes.

No comments on internal logic were expressed about Literacy. Again, this cannot be taken to indicate the absence of cohesion, but that pupils perceive it as a less essential feature of the subject.

Creative freedom

The issue of ownership of learning viewed not as autonomy, but as the affordance of creative freedom of thinking or acting is expressed as central in pupils' discussions of learning in Subjects. According to pupils, Mathematics aims at procuring a unique, correct answer, whereas Literacy allows for greater creative freedom. Iris explains:

> Iris: In Literacy, you can change the word 'said' into ' yelled'. But in Mathematics, 2+2 is always going to be 4. And I just like when you can change things in Literacy. And when... Well I like when we do stories in Literacy, um, as I said, that's how I started writing books too. And it's just...
> P.M.: ...something you can't really do in Mathematics?
> Iris: No.... I don't feel creative in Mathematics.

Caleb concurs, and further asserts the value or skill of imagination for the subject of Literacy, which was not mentioned as pertinent or necessary for Mathematics:

> Caleb: I'm interested in Literacy because when you're writing, like what we're doing now, Alice in Wonderland, you can make up... but when you're like in the Party, you can't, but when you're in Wonderland you can, because it has the name 'wonder' in it so you can just put flying horses, and flying schools...

Breaking norms and expressing themselves in alternative ways is viewed as essential to pupils, who, like Caleb, still understand that creative freedom is also subject to logical constraints. The personal element this creative freedom allows was not linked with Mathematics by any pupil, since following pre-structured methods to achieve a unique answer limits this opportunity significantly.

C.1.2 Lesson related features

Pupils also remarked on how learning in subjects impacts on the organisation, and by extension on the social climate of the classroom. This level of specificity is higher than the one described in the previous chapter, which described the modus operandi of the classroom in a generic,

atemporal manner. Reflecting on how the classroom compartmentalises learning time and pupil effort into lessons, pupils describe additional constraints to their learning.

The three most significant constraints of the lesson-doing classroom are time, teacher demands, and work settings (collaboration/individual work). Kena provides an example of additional time constraints, created by the pressure to complete work before moving on to a different subject:

> Kena: Some times, at that moment, because we only had 13 minutes, when Miss T explained it to us, I thought it would be a bit easier than when I was actually thinking more into it. Because when you're thinking, it kind of wastes a bit of time, and because we only had 13 minutes, it was a bit hard. And my target was to get at least three done.

Although little to no thought was given to time constraints when pupils discussed past, undifferentiated in terms of subject learning, when they reflected on present, subject-related learning, time constraints were mentioned by nine pupils in all.

Additionally to time constraints, pupils also have to consider the teacher's expectations, which some describe as being different in the two core subjects. Olutomi suggests:

> Olutomi: You have to think a lot when you're doing Literacy because if you just write down a lot of rubbish then people... the teacher will get really angry and will scrunch it up and throw it away, but if you're really concentrating and writing it nicely with your best handwriting, then the teacher will be really happy with you.

Although my own presence in the classroom alerted me to no such difference in the teacher's stance, it appears that pupils experience a tendency of the teacher to focus on different aspects of learning in each subject. Almost all pupils discussed the teacher's emphasis on them following specific methods in Mathematics; seven pupils discussed the teacher's emphasis on listening, writing, and good presentation (handwriting) in Literacy, which led them to regard the subject as less likeable. Rhonda is one of those pupils:

> Rhonda: Learning in Literacy is about listening to Miss T and writing in my book.

Lastly, the work settings of the classroom appear to highly influence how pupils experience subject- based learning. It is a school-wide decision for collaborating partners to be semi-permanent, and to rarely change through the school Years. Each pupil has such talking and collaborating partners they usually work with, one for Literacy and one for Mathematics. Change of partner or disruptions in communication and collaboration styles have an impact on pupils' preference for a subject. Lara's example is quite characteristic of this:

Lara: Maths, actually I do like Maths, I don't like Literacy.

P.M.: So that makes you talk more, you think?

Lara: Not sure. I think it's my partner, because she was helping me. And we were collaborating much more than, much better than when I was working with Olutomi.

P.M.: So it's not chatting, it's collaborating.

Lara: Yes. Because I was talking about the learning, 'this is what I think, do you have anything that you want to say or think'. And I was collaborating well.

It is necessary to add that, since collaboration is one of the school's learning attributes, allowing for the same partner teams to work together through the Years allows them to develop an unspoken 'definition', or particular sense of the concept of collaboration. Having to reinvent, or re-negotiate what collaboration or individual work means adds extra pressure when also having to consider time and teacher expectations, as seen above.

D. MY LEARNING THROUGH SUBJECT RELATED TASKS [Learning about how I learn through specific learning experiences]

Making sense of past learning often came to pupils as a process of describing the outcome of an undifferentiated, collated sum of experiences. Their metalearning in these descriptions could be conceptualised as a thread of meaning connecting those experiences: mostly unbroken, with few important or significant events breaking it or changing its texture or direction.

This chapter aims at exploring whether continuity or discontinuity is traceable and evident in specific learning events. In other words, which effect pupils' reflections on specific episodes of learning in the classroom have on their metalearning: congruent, incongruent, or neutral? And if either, do pupils use that sense-making to guide themselves towards future learning?

This section is a mediated representation of pupils' sense-making of their personal experience of learning in the subjects of Literacy and Mathematics. I will thematically represent pupils' understandings and attitudes, with an aim of facilitating readers' understanding of how pupils discuss learning about learning through specific learning experiences [consolidation-expansion tasks].

This section complements the previous section on pupils' description of how learning happens in subjects by adding the personal element of pupils' rationalizations and attitudes towards making sense of subject-specific experiences of learning. Most importantly, however, this section builds on section B of the previous Chapter (learning about learning in the classroom), due to the potentiality the subject-related tasks have of being instantiations of personal diachronic metalearning. Simply put, interview data on specific learning tasks have the potential of showcasing whether, how, and why pupils implement the attitudes or strategies stated as diachronic metalearning, and how previous metalearning-derived knowledge is informed by new learning experiences.

Pupils' making sense of how they learn through the experience of doing subject-related tasks addresses my main research question,

> How do pupils construct/activate/ experience metalearning as it occurs in specific learning environments?

by highlighting how sense-making is furthered and enhanced in high contextual specificity situations.

This section is not structured as a presentation of separate, individual rationales, but as a thematic representation aiming to showcase the range of meanings ascribed to the same context/s of learning.

Finally, this section addresses all three research sub-questions in specific ways:

- RQ1a: What accounts do pupils construct of their metalearning as it happens in the context of their classroom? Pupils' making sense of their learning in highly specific contexts of learning (subject-specific tasks) is communicated through predominantly explanatory accounts. Pupils express their rationales for the decision making process or for the decisions made during working on subject-specific tasks.
- RQ1b: Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do? Making sense of specific, subject-related experiences of learning is relevant to how pupils activate previous metalearning, or make different sense of their past experiences in view of the new ones.
- RQ2: Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning? In order to make sense of their learning through subject-specific tasks, pupils refer to making use of specific elements of their physical and social environment. Although the same elements that constitute the classroom are also available in subject-specific tasks, their availability and utility differs upon occasion/context.

D.1 Metalearning reflection

Pupils were supported in their making sense of their own learning in Literacy and Mathematics tasks through short videos of themselves completing the tasks, on which they were invited to reflect. They were, therefore, invited to engage into an externally initiated process of reflection on their metalearning. As discussed in the Methodology Chapter, this Stimulated Recall Interview aimed at helping pupils articulate statements particular to the process they follow to make sense of the particular learning episode/task they have viewed themselves doing [metalearning process], and perhaps some conclusions they might have reached about it [metalearning knowledge].

This artificial situation was aimed at emulating the process of metalearning reflection, or insightful thinking about one's own progress towards learning. It is actualised, however, on the condition that: a. the learner perceives learning to have taken place, b. the learner has the facility to assess the achieved learning against personal or personally endorsed external criteria, and c. the learner can identify ways in which the learning achieved bridges past and future learning.

These are the conditions which support the differentiation between metacognitive and metalearning reflection: where metacognitive reflection addresses knowledge, metalearning reflection addresses learning, of which knowledge is but a single aspect/output. Iris was the only pupil to discuss exerting conscious control over her metacognitive reflection, and thus to exemplify elaborated, deliberate metalearning:

P.M.: Do you think having done this gave you something you can use in your future learning?

Iris: *shakes head*

P.M.: No?

Iris: Not really.

P.M.: So if someone gives you the same task again, you're going to approach it with the same attitude?

Iris: Yes. If it was Literacy, I have no idea. But if it's in Mathematics, I'd probably think back on this. Think ' ok, so, what's it going to be now.'

P.M.: So if it's Literacy, you remember what you'd done last time...

Iris: *shakes head*

P.M.: I got it the wrong way around?

Iris: Yes, you got it the wrong way around. So if it's Literacy, sometimes I'm just on track and I just think ' Ok, whiteboard, just put it all down', and then, maybe when I'm finished I will think about what I'd done the previous day. But when it's Mathematics, I have to do this before.

Regulating the activation and determining the function of metacognitive reflection is a capability indicative of aptitude in metalearning. Iris's control of processes of reflecting (planning and monitoring) is described as stemming from her understanding of herself as a learner and of how she learns. Although this example was unique within my sample, I need to note that all pupils were aware of the principle of reflection (it was a set learning attribute- 'metacognitive reflection'), although not of its specific process or function. This resulted in metacognitive and metalearning reflection being done and communicated interchangeably. However, the predominant type of reflection in Stimulated Recall Interviews (hereby SRIs) is on metalearning: on how, in other words, the learning experience in question affected them as learners, and on how it allowed them to gain insight into how they learn (by using what they know about knowing and thinking, ergo metacognition).

Additionally to the differentiating element of knowledge versus experience, pupils' interviews highlight another difference between metacognitive and metalearning reflection: the goal. Whereas metacognitive reflection aims at producing an assessment of whether knowledge has been implemented effectively to resolve an issue, metalearning reflection aims at incorporating new insights about who the learner is into the attribute and belief system they have about themselves and their learning. In other words, metacognition is, more often than not, absolute due to the existence of criteria of success (e.g. following formula to solve equation), whereas metalearning is more ambivalent, due to lack of specific, personalised criteria about how each person should learn and what their learning self should be like. In the case of metacognitive reflection, the goal is verification; in the case of metalearning reflection, the goal is homeostatic regulation: finding a new balance, suited to how one perceives that they learn, to their image of their learning self, and their expectations from it.

Pupils' SRIs were a rich source of information on the process which pupils follow to achieve homeostatic regulation, or the conciliation of past, present and future attitudes, understandings and intentions. The element of reflection with an aim of strategising for the future lends pupils'

metalearning a dynamic property, and can be underscored as that process which supports continuous effort towards improving learning and the learning self. Summarily, synchronic metalearning can be viewed as a learner's effort to bridge who they were and how they acted to achieve that in the past with who they want to be in the future, through reflection of who they are and how they learn at present.

D.1.1 Structure of reflective accounts

The reflective accounts pupils produced in their Stimulated Recall Interviews can be viewed as being structured at two main levels: description (direct reference to what they were doing in the video), and reflection (expression of personal rationales guiding pupils' decisions). Most pupils felt quite hesitant to disclose and discuss their personal rationales about their own learning during the process, and were keen on only providing a description of visible actions depicted in the video. Although not uncommon, their stance indicates that discussing personal rationales is a way of talking about learning that is perhaps less common and familiar to them than, for example, assessment, or cycles of instruction-response.

This aforementioned hesitation might also be attributed to the fact that reflection in the sense of systematic deliberation and introspection is not a process pupils would have consciously activated if unprompted. Fewer pupils made mention of reflecting on their learning, instead of on results/outcomes (metacognition), but this cannot be taken to mean that the rest of them do not employ such processes. It could, however, be taken to mean that reflection (which is a learning attribute) is used in the classroom to describe a process quite different from reflection on learning.

An indication that pupils did not find the process of reflecting on learning to be completely strange was that, after a certain elapsed video time, they shifted their attention away from the video screen and started disclosing and discussing 'internal' events, such as feelings, decision-making struggles etc. This process of moving from the outside inwards, culminated in almost all accounts in pupils being prompted to discuss 'what they can do better after this learning', and 'how they plan on using this learning in the future'.

Pupils' accounts of reflection on specific learning experiences are structured quite differently from those on past learning in general. As seen in the representative example of Yasar's SRI,

pupils communicate experience through addressing specific constituent aspects of it, which my analysis highlighted as congruent with the theoretical description of Marton and Booth (1997): when relaying specific, instead of general past experiences, pupils do so by addressing the 'direct object of learning' (op cit), meaning the content being learned,

> Yasar: We used our compass knowledge to find a way.

the 'act of learning', meaning the experience of the way in which learning is done,

> Yasar: Miss T was telling us SatNav instructions and we had to follow those instructions.

and, most importantly, the 'indirect object of learning', meaning the kind of capability the learner is trying to develop, and which, in my view, is the most akin to metalearning.

> Yasar: I'd learned about the compass things before. But what I really wanted to learn today is 10 degrees turn, more like 20 degrees, instead of 45, or 90 or 180. Because these are simple, but what I want to do is the hard ones.

Nevertheless, not every reflective account included consideration of all the three constituent aspects of experience. As Marton and Booth (op cit) also stress, such exhaustive accounting for all aspects of a learning experience is unusual and tedious in the least, and people tend to only communicate those aspects of their experience which they deem most significant, representative, or transformative. Indeed in the present research, it is unsurprising that the experience of classroom learning that happens in the structured and routine manner described in sections A (previous Chapter) and C is communicated in pupils' accounts as moderately significant, representative, or transformative. Finally, the unpredictability of chancing upon such a significant experience on the actual day the SRIs were being conducted obliges me to make all my subsequent claims tentatively, as examples of instantiation of metalearning, and not indisputably crucial to its construction or furtherance.

Having expressed the limitations of this analysis, I conclude this segment on the structure of reflective accounts with the forms pupils gave their accounts depending on the meaning they ascribed to reflection: a. reflection meant as a process of recollecting (mainly addresses the What of learning); b. reflection meant as a process of reviewing and adjusting into future plans the processes followed for achieving learning (mainly addresses the How- act of learning, through metacognition), and c. reflection meant as a process of reviewing and adjusting the

process of applying oneself to learning (mainly addresses the How- indirect object of learning, through metalearning).

A final note on these forms or types of accounts as seen in pupils' SRIs is that they are interdependent, and perhaps steps of a process, building from recollection on to metacognition, and ultimately metalearning. This tentative observation is based on the quantitative overview of reflective accounts: all 46 accounts were based on recollection, 35 addressed metacognitive plans, their review and application, and only 16 included statements on the impact of the learning experience on the learning self, ergo metalearning.

D.2 Synchronic metalearning for tracking changes in learning

My aim of identifying instances of pupils making sense of their recent learning experiences led me to search for that part of pupils' SRIs which predominantly exhibits personal meanings instead of descriptions. This moving beyond description is mostly evident in pupils' final part of their SRIs, in which they discuss whether, how, and why the learning they just did was useful to them, and how it might impact their future learning. The final excerpt from Carrie's SRI on Literacy is quite representative of the way in which pupils move beyond describing and into making sense of their learning:

P.M.: What do you think you've gained from this? What have you learned?

Carrie: I've learned that you need to put your hardest work into it, because what you put in, comes out.

P.M.: How did you get that thought from this particular bit of learning?

Carrie: Sometimes I think that I'm doing something really good, but the effort I'm putting into it is not great. And I think 'why didn't I do it the way I usually do it?'

P.M.: So you took the risk of trying to improve words [not required by task].

Carrie: I think I was trying a bit too hard.

P.M.: What do you think you can do differently next time? When you next do a diary entry or you're asked to describe a story.

Carrie: I would just be ... I would try to ... I won't put so much pressure on myself to get everything right. I'll just kind of get good ideas, but not make it so extreme. Because it just pushes me that I have to do the work, and then as well, if it's near the end of the session, I do get a bit intense.

P.M.: What do you mean?

Carrie: It just gets me... and I haven't done the amount of learning you're supposed to do, my writing as well changes. And my way of thinking changes as well.

P.M.: How?

Carrie: It just feels 'I have to do this on time, I have to do this on time', and when Miss T says '5 minutes', I get really intense. But I try to think that this is my learning, I have to take priority.

In this example account, as in others, synchronic metalearning is located in how the pupil understands why and how they applied themselves to the learning at hand, as well as in the expression of possible ways in which this experience might inform future ones.

A further interesting feature of this part of pupils' accounts is what was also discussed in section D.1., as temporal continuity: learning and the learning self exist/have existed/will exist in past, present and future. However, it is the task of the learning self to reflect on the past (learning and learning self), in order to envisage and strategise about the future (learning and learning self). Jade describes how and why she does that:

Jade: [this learning] It was fun and exciting.

P.M.: Why?

Jade: Because I never got to do it before, and I got to know some new words and vocabulary that I had never seen before, and then next time, I can use this previous learning for another learning.

P.M.: How are you going to use this learning?

Jade: I want to do stories and stuff. Because...

P.M.: How are you going to use this learning to write a story?

Jade: Because I can improve my previous learning...

P.M.: How?

Jade: By adding new words, so the reader can be satisfied and interested by it.

In her case, although she is aware that past relevant knowledge and experience was indeed had before this day, the improvement achieved through this task will be conducive to satisfying her future ideal readers.

My presentation of pupils' synchronic metalearning, therefore, is a re-presentation of the pupils' learning self actively describing how/if their present is better than their past, and in what way the future can also be expected to be an improvement on the present. As made evident in Jade's excerpt above, the word to have in mind is improvement: a rather more optimistic take on qualitative change in experiencing. Another elucidating example is that of Amrita, whose sense of her present experience leads her to expect that future learning will be easier, by virtue of her (by then) past experience:

> P.M.: So next time someone tells you to do something like this, write a poem, or do an activity similar to this, will you know something more about how to do it?
>
> Amrita: Yes. Because I'll have already done it. If I still have the same book, I can look through and find this again. Or look in my old book.
>
> P.M.: Is there something that you can do better now, after you've done this task than before you'd done it?
>
> Amrita: Yes. Remember the ideas I used here, and lock them in my brain. If I've got anymore good ideas, I can use them to make it better.

Although this intention of looking back at this point when learning in the future is strongly present in these accounts of synchronic metalearning, it was only hinted at when they discussed past, non-temporally bound learning. It appears, therefore, that the function of 'anchoring and adjusting' is more evident when thinking about the effect of specific learning experiences on one's learning progress, rather than on how a compilation of experiences resulted in learning (past metalearning).

This effort towards incrementally constructing future learning and the future learning self can, by extent, be viewed as a process of tracking qualitative changes in experiencing learning. Present experiences of learning constitute a new basis on which expectations and approach towards future learning are designed and effectuated. Although not radical in its nature, especially in systematic/structured/scaffolded learning as in the sample case, the existence and awareness of a qualitative change in a learner's approach to the experience of learning constitutes synchronic metalearning.

D.2.1 Examples of metalearning strategy (in accounts of synchronic metalearning)

Strategy, as suggested in Chapter 3 is the balance between ends, ways, and means. Metalearning strategy that is made evident in learners' accounts of diachronic metalearning (Chapter 5) can be viewed as a regulatory balance between: who the learner wants their future learning self to be (ends), the optimal manner in which a learner can apply themselves to learning (ways), and the affordances and constraints the learner perceives their own capabilities and the context of learning to place upon them (means).

The mechanism for achieving that balance, regulation, constitutes an orchestration of these three components of a strategy through continuous consultation of and interaction with the social and physical context of learning, a tempering of the learner's wishes with the signposting their environment directs them to learn through. As also discussed, I abide by my choice of naming the outcomes of this process strategies, and not plans, in order to stress their non-rigid, non-linear, open ended nature, in stark contrast with metacognitive plans, which are sequentially activated, implemented and reviewed for effectiveness.

Accounts of synchronic metalearning, which are tentatively viewed here as instantiations of a pupils' diachronic metalearning, do, each in different parts and in varying degrees, indicate towards the existence of a strategy. Although only fragments or allusions towards their ends, ways and means are identifiable, there is a sense that regulation guides that strategy intertemporally, connecting those fragments of strategy from past into present and future, as seen in the excerpts in section D.2. Strategic sense-making is evident in statements reflecting: a. an awareness of metalearning (how applying themselves to learning in the past impacted their learning); b. realisations about present learning (making sense of what the experience means); c. conceptualisations of improvement on approaching learning in the future (making sense of how to best apply self to anticipated future learning).

a. Statements reflecting awareness

Most pupils discussed their awareness of how they learn through statements exhibiting their decisions and actions in regard to learning as a response to a situation they anticipated. In other words, pupils' awareness is made evident through statements like 'I acted like x..., because I knew or made aware that f... was/would happen'. Nasatya, for example, was aware that he had

to pursue a target his teacher had set for him, and accordingly pursued that goal in the context of his task:

Nasatya: Because I thought this could be extended, so I extended it by using connectives and making it even longer, because my target is to extend sentences.

P.M.: Why is that your target?

Nasatya: Because I always use short sentences and I don't extend my sentences, so my teacher gave me the target to extend sentences and use connectives.

P.M.: How do you do that?

Nasatya: By thinking really hard and making another sentence related to the first sentence, and think of some more things that you can link to that that are related.

Pupils' awareness of how they learn or need to learn appears therefore to be significant enough to them to deliberately make use of and discuss in order to justify how they applied themselves to learning. Awareness of metalearning is evident in situation awareness, awareness of making metacognitive choices, and, finally, awareness of awareness itself.

Being aware of the context of learning and the affordances it places on the learner was evident in all pupils' accounts, to varying, however, degree. Gerry, for example, discusses being really unsure of what the aim of the task was, and resorting to asking the Teaching Assistant for directions:

P.M.: Why were you showing it to Miss A (the TA)?

Gerry: To see if it was right or not.

P.M.: How would that help your learning?

Gerry: not really help my learning?

P.M.: Then why were you showing her?

Gerry: to see if it was right or wrong

P.M.: Why is that important?

Gerry: Because ... I don't know.

Other pupils (the vast majority), like Bader, demonstrated a stronger awareness of task and contextual demands, and discussed a process between choosing methods (metacognition):

P.M.: Which part of it was difficult?

Bader: When you had to shade what part the half was.

P.M.: What was difficult about that?

Bader: We had to find 9 of each.

P.M.: Why was that difficult?

Bader: Because you can't do the opposite side. Because if you'd done one, like an L, you can't then do one like a 7, because that's basically the same.

P.M.: What kind of thinking did you do to get to the answer?

Bader: I counted 18, so I split that in half to get 9, the half of 18 is 9.

P.M.: What did you do then?

Bader: I shaded in, and then I'd done 9/18, because I knew it was 18, the boxes, and 9 were shaded in.

Another interesting example is that of Carrie, who, like some of her peers, discusses not only being aware of task and contextual demands, but of moving beyond choosing cognitive courses of action to deliberately activate dispositions towards learning:

P.M.: What kind of thinking did you do to learn about analogue and digital clocks?

Carrie: I had to use a bit of self-confidence.

P.M.: Why?

Carrie: Because I'm not really... not really that confident with time, and it gets me anxious that I'm going to do it all wrong.

P.M.: So when you were given this, you felt... what did you think about it?

Carrie: I thought it was hard at first, but, as you kind of learn, it gets a bit easier for you. Like when I'm stretching, it loosens me up.

This interesting analogy with stretching which she also mentions doing physically during completing her task suggests an awareness of the constraints learning places on her both physically and mentally, but also the affordances and capabilities she can utilise to fortify herself against them.

Lastly, Iris's account (also shown in segment D.1) showcases an awareness of awareness itself:

P.M.: Do you think having done this gave you something you can use in your future learning?

Iris: *shakes head*

P.M.: No?

Iris: Not really.

P.M.: So if someone gives you the same task again, you're going to approach it with the same attitude?

Iris: Yes. If it was Literacy, I have no idea. But if it's in Mathematics, I'd probably think back on this. Think 'ok, so, what's it going to be now.'[...] So if it's Literacy, sometimes I'm just on track and I just think 'Ok, whiteboard, just put it all down', and then, maybe when I'm finished I will think about what I'd done the previous day. But when it's Mathematics, I have to do this before.

She is not only aware of possible courses of action or methods she can use to achieve learning, but also of the deliberate, conscious process through which she regulates those. This type of statement was unique amongst pupils.

b. Statements reflecting realisation

Pupils' accounts of making sense of current experiences of learning suggest that pupils make sense in two ways: taking account of new information about the experience, and positioning that experience as congruent or incongruent with their sum of past experiences. Amrita and Olutomi discuss gaining new insights into how they learn. Amrita realised that her successful attempt of using the Mathematics dictionary in an innovative way could be generaliseable to all geometry tasks:

P.M.: What do you think you've learned by doing this activity?

Amrita: How to sort things out. If it's, like quadrilateral the sides...

P.M.: How will you sort them out? What did you learn?

Olutomi: To use the dictionary.

P.M.: If somebody gives you another pile, you will again use the dictionary?

Olutomi: Yeah.

P.M.: Next time someone gives you something like this. Perhaps not triangles, but shapes. Do you think you've learned something about your own learning? About how you do this learning, that you can use?

Olutomi: Yeah. I found out that I could... always rely on the dictionary to help me. In Literacy, I would use the dictionary and thesaurus to help find words, different ones.

P.M.: So now you think you'll start using it in maths as well?

Olutomi: Yes.

Elizabeth realised that her approach to learning was rather rushed in Mathematics, changed it, and maintained a focus of awareness on her speed during Literacy as well:

(Mathematics SRI):

P.M.: Do you think next time you do it, some part of doing it will be easier because you did it today?

Elizabeth: Yeah. Because I practised, and now understand that rushing wouldn't make your work right. Because you're doing it rushed and you're not thinking what you're writing.

[...]

P.M.: Will your thinking be better next time?

Elizabeth: I need to stop rushing and think about what I'm writing.

P.M.: How can you improve your thinking?

Elizabeth: Not go really slow, because then you'll get behind. Just go a little bit fast, but not really fast.

(Literacy SRI):

P.M.: How did you feel when you were finished?

Elizabeth: I felt like it helped me more.

P.M.: What did it help with?

Elizabeth: Maybe when I was doing maths I decided that I had to think. I needed to think of what I was [*unclear*], so then I used it in my Literacy as well. And it helped me more.

P.M.: Next time you do learning like this. A task like this. Do you think you'll be able to do something better because of what you did today?

Elizabeth: Yeah. Because I was reflecting on what I was doing.

P.M.: What do you mean by reflecting?

Elizabeth: I was reflecting about the way I was rushing when I was doing maths. Then I thought about it, and I found out that if I worked a bit slower than before, it helped me. So I decided to use it in Literacy and some other subjects.

P.M.: So next time someone gives you a task like this, what will you be able to do better?

Elizabeth: Work slower.

P.M.: And achieve what by working slower?

Elizabeth: I can get most of my answers right. And have really good ideas by thinking. Because you can't really think really fast. You have to wait. And look at the picture and think. If you get more time, you get better ideas.

Olutomi, on the other hand, achieved the realisation (or rather an undisputable confirmation of his realisation) that he did not, in fact, achieve any learning through his Mathematics task:

Olutomi: I said to Lara 'we're going to write in your book', but she said no. And then I started to get angry so I put my book away and I was doing the easy.

P.M.: So it affected your learning?

Olutomi: Yes.

P.M.: How?

Olutomi: Because when I was working at the video, I saw that I was being really lazy.

Finally, Ava exemplifies how she realised whether her current learning was congruent with her idea of successful learning, as that idea had been shaped in the past:

P.M.: Do you think you improved while you were doing this?

Ava: Yes

P.M.: How do you think that happened?

Ava: Because when I understand, like, the pattern of it, I can see it in different problems with clock.

In juxtaposition, Olutomi realises that it was his emotional state that did not allow him to gain anything from his learning experience:

P.M.: How did this [miscommunication] affect your learning?

Olutomi: Make me get angry.

P.M.: And that's bad for learning? You can't learn when you're angry?

Olutomi: I just forget what I was thinking about, and then I have to rethink it again.

P.M.: Did you learn anything about your own learning?

Olutomi: No, I haven't.

Denial, however, plays a very strong part in pupils reaching realisations, especially in the case of making unflattering admissions to themselves and others. Rhonda for example, in spite of originally admitting that she was unsuccessful in completing her task due to incorrect application of methods, later on attributes that failure to others:

Rhonda: Because some people on my table kept distracting me. I was keeping on laughing and getting distracted. I didn't get my learning done.

P.M.: Do you think it was because they were distracting you, or because the task wasn't that interesting?

Rhonda: It's because they were distracting me.

P.M.: Did that affect your learning?

Rhonda: Yes.

P.M.: What happened?

Rhonda: Gerry kept making funny faces and touching my learning. I couldn't see my learning.

P.M.: He's not touching you there.

Rhonda: No, but in the middle of it (the video).

Generally, in those cases where realisation is combined with acceptance, awareness of past attitudes and ways of doing learning is informed by current realisations. Current experience, therefore either validates past sense-making of what learning is or should be like, or slightly changes it with a view of improving in specific ways.

c. Statements reflecting conceptualisations of improvement regarding future learning

In their majority (16), pupils described improvement in terms of performance. The speed of task completion as well as a higher degree of achievement appear to be the two main goals pupils

strive to achieve through conceptualising improved approaches to learning in the future. Rhonda is fairly straightforward with what she wants her approach to future learning to yield:

P.M.: What do you think you'll be able to do better the next time Miss T gives you a similar task?

Rhonda: I will be able to find it in click of time.

Caleb conceptualises his learning self as an expert writer, which leads him to conceptualise his future learning as including the demands placed on an author:

P.M.: The next time someone tell you to write a story, will your thinking be different from today?

Caleb: Yeah, it will be different. Because now I had time to think, but sometimes... If you're an author, you don't really have that much time to think, because you put an advert, and then people are really waiting for it to come out. So you really need to hurry, you don't have that much time.

P.M.: So you think next time you'll be able to do it more quickly?

Caleb: Yeah.

As far as conceptualising learning more effectively (in terms of performance), Nasatya's description is very clear:

P.M.: What do you think you learned during this task that you can apply in future learning?

Nasatya: To do notes and sentences at the same time.

P.M.: How will that help?

Nasatya: Writing sentences and improving them, and putting notes down to help you, like adding your own sentences with that note.

P.M.: Ah, so writing notes and then developing them into sentences?

Nasatya: *nods* and then my teacher will see that I have done sentences with those notes and she might like that because I've never done that before and I'm being creative.

Interestingly, all the above conceptualisations require action on the part of the learner. Hani, together with other 3 pupils, however, conceptualise improvement as a rather passive or self-generating process:

P.M.: Will you improve something about this kind of learning next time you do it?
Hani: Yes.
P.M.: How?
Hani: As you get older, you get new words in the future. Then you can improve it as you get older and older.

Both active and passive stances towards improvement are, as discussed, based on what pupils expect future learning to be like. However, pupils can only speculate as to whether this content/type of lesson/type of task will be further worked on in the classroom. Yasar is one of the pupils who, although able to conceptualise applying himself to learning in an improved way, is unsure as to whether he will ever have to:

P.M.: So what's your technique for comparing after doing this? What's improved?
Yasar: To read the first sentence, and then to read the next sentence and then compare them and see what's the difference and what's the similarities.
P.M.: Interesting. Will you be using that in the future, then?
Yasar: Um... not quite sure, to be honest.

Since pupils are aware that learning is structured and leads them somewhere, although they are not sure where, they either decide to strive for some control of the process, like Nasatya, or observe change as it happens, like Hani.

C. and D. SYNTHESIS: INTERPRETATION

This section is my own analysis- interpretation of pupils' descriptions of learning as provided to them in the classroom. Although based on the pupils' descriptions, this is a researcher's account of them, and entails scientific description and highlighting links to existing theory on metalearning.

i. Context, learning and the learning self in specific learning tasks

It is not uncommon for pupils to indicate a special preference for a taught subject over others. However, pupils who express a preference for one or more subjects over others are likely to justify their choice(s) by detailing how the subject is 'good' in relation to their learning (establishing that the context is congruent with the habits and preferences of the perceived learning self), or that the learning self is 'good' for the subject (establishing that the perceived learning self can benefit from being taught in/through that subject). Both explanations are grounded on two requirements: that there is some understanding of the learning self, and some understanding of the modus operandi of each subject. Metalearning, in this instance, occurs as the stance pupils develop in response to the demands placed on them both by favourited and less liked subjects.

Consideration of subjects constitutes an intermediate level of context between classroom learning (as described in the previous Chapter) and learning through specific tasks. It also constitutes a transitory level of metalearning, which, although more evident in accumulated, diachronic metalearning, is also strongly evident in pupils' accounts of synchronic metalearning. 13 pupils discussed experiencing learning in general as well as situated learning through a filter of liking or disliking a specific subject. Iris is consistent in her view:

> <u>Interview on diachronic metalearning</u>:
> Iris: I don't really like numeracy, but I still try, and if I'm stuck in a question, I'm like 'I can really do this'.

And the first thing she whispered when her SRI Mathematics video started playing was:

> Iris: (whispered) I don't really like this.

[...silence...]

P.M.: You look quite focused here.

Iris: *sigh* yes.

P.M.: But you're not enjoying it that much.

Iris: No. That's why I'm focusing on my learning, that's why I'm focusing in Numeracy all the time. Because, 'Just get it over with Iris, get it over with'...

However, like all the 13 pupils who expressed experiencing learning with strong preferences for a particular subject, Iris justified how and why Literacy is a more enjoyable context of learning:

Iris: In Literacy, you can change the word 'said' into ' yelled'. But in Numeracy, 2+2 is always going to be 4. And I just like when you can change things in Literacy. And when... Well I like when we do stories in Literacy, um, as I said, that's how I started writing books too. And it's just...

P.M.: ...something you can't really do in Numeracy?

Iris: No.... I don't feel creative in Numeracy.

Literacy and Mathematics, being the two core aspects of pupils' experience of learning (and have been for all their Years until Year 4) are experienced by some pupils as a dichotomy, as two very different contexts that impose different constraints and differences upon them.

Pupils feel that certain subjects support and embrace who they are as a learner more than others. The sense of belonging pupils derive from their preferred subjects seems to encourage them towards reflecting and comparing between facets of their often conflicting learning selves. These comparisons often lead pupils to reflect on who they are as learners and juxtapose that with what kind of learner each subject requires them to be.

Pupils often instigate this form of metalearning reflection when thinking about how each subject supports, rewards, or questions who they are as a learner. They seem to perceive, therefore, that each subject has a different idea of what a good learner is, and that each subject triggers different reactions, thoughts and behaviours from them.

As learners, they seem to perceive having to 'shed' their previous learning self when changing subjects in the classroom, which is a process and prospect they find quite difficult and problematic. This problematic situation is reminiscent to what literature has described as 'the

doorway effect' which may be demonstrated in participants who simply imagine walking through a doorway (Radvansky, Krawietz and Tamplin, 2011; Lawrence and Peterson, 2014).

Caleb talks about experiencing difficulties with recalibrating his thinking to do good learning in different subjects:

> Caleb: When you are happy, you want to do the work, you keep thinking about the work, and there's nothing else to think about.
>
> ...When I have done good learning in science for example, it also affects the learning I do after that. And the thinking I do for the previous subject I will also use in the next subject. That doesn't help at all. Guessing does not help in Mathematics, and my teacher will tell me to stop guessing. So I try to focus.

Understanding the need to adapt to a different style/routine of thinking is made clear to learners through teacher feedback on how to do learning.

> Rhonda: If we did science, and we got stuck with solids and liquids, we would ask for help from Miss T. If she says 'try to do it one more time', we will ask someone in our table and then we'll understand what we have to do.
> P.M.: But you wouldn't be able to do this on all subjects, is that what you're saying?
> Rhonda: No.
> P.M.: So you wouldn't be able to this in Mathematics for example.
> Rhonda: No.

The teacher highlighting that different thinking is required alerts learners to the context of learning having changed. Therefore learners look for cues on the affordances and constraints of each context (subject): what is allowed and what is not, what is rewarded and what is not. Pupils then 'don' a different learning self to respond to the changed demands as they perceive them. Olutomi lists the teacher's demands that are different in Literacy, and also what he perceives to be a change in her attitude to learning:

> Olutomi: When you're doing Mathematics ... You have to think a lot when you're doing Literacy because if you just write down a lot of rubbish then people... the teacher will get really angry and will scrunch it up and throw it away, but if you're really

> concentrating and writing it nicely with your best handwriting, then the teacher will be really happy with you.

If, like Olutomi, they feel these demands are onerous, pupils suggested forming a dislike towards that subject. It does not (or does no longer) foster who they are as a learner, because it does not value the aspects they do in their learning self.

ii. From diachronic to synchronic to diachronic sense-making

Since the original thoughts that initiated pupils' sense making are inaccessible to them, and therefore also to me, the process of metalearning is accessed in media res, in the midst of things. Certain attitudes toward understanding learning in the context of learning (diachronic metalearning) become instantiated when pupils apply themselves to learning tasks and reflect on learning in those tasks (synchronic metalearning). Accessing this process in its middle means tracking how metalearning is initiated, by establishing a. if and how diachronic metalearning feeds forward into synchronic metalearning and b. whether synchronic metalearning (the outcomes of reflection on learning tasks) has the potential to feed back on diachronic metalearning. In both cases, the focus is on synchronic metalearning (sense-making of learning in the present).

As far as the first matter is concerned, pupils indicated past sense-making feeding forward into present sense-making in two ways: Through an effort to reflect on (essentially recollect) past relevant learning experiences in order to gain insights into how they learn, or how they should be learning, and through attitudes towards the context (in this case, curricular subject). This can be viewed as activation of the dispositions built on diachronic metalearning through the pupils' learning journey, and it is essential to remark that it is not always a conscious process. Sample pupils' reflective accounts indicate a range of awareness and executive control over control itself and also the timing and scope of reflection relevant to learning experiences.

The extent to which synchronic metalearning feeds back into diachronic metalearning is showcased in pupils' statements of intention of utilising current learning experience to improve applying themselves to future learning experiences. This process of reflection-projection is independent on the significance of the learning experience under consideration, which is

evident in that pupils reflected on experiences to conclude that they had no potential of changing how they would approach future learning. When reflecting on experiences that were deemed to have potential for guiding improvement, most pupils produced improved metacognitive plans, which indicates a focus on improving approaches to accessing content. This stance could be interpreted as an indication that they cannot expect that their context can be experienced in a qualitatively different way, but only through a quantitatively different one (more facile, quicker, more effective, and so on). In my view, this reflects more on the structure and routine experience of the context, rather than pupils' belief in improving how they approach learning. This belief, although interspersed in their reflective accounts, was scarcely evident in their planning for the future. Nevertheless, the minority of pupils that did discuss improvement as qualitative change (different way of applying themselves to learning), appeared not to construct new strategies for that purpose, but to choose from an array of approaches that were previously aware of, but had not considered applying. Change for qualitative improvement in approach to learning appears therefore to mean to pupils reviewing their approaches to learning and updating their personal approach by implementing known alternatives in view of recent empirical evidence (experiences of learning).

Pupils' willingness to improve metalearning directly (design metalearning strategies) or indirectly (by regulating the use of metacognitive, or even meta-affective and meta-motivational plans) appears therefore to be strongly, although not entirely mediated by the plans and strategies favoured by the classroom. The influence of parents and out of school projects is evident in the way pupils discuss diachronic metalearning mostly, and minimally in discussing improving future learning. This can also be attributed to the fact that pupils anticipate that the context of learning will impose the same affordances and constraints upon them as it has so far. The factors, therefore, that have influenced how pupils shape their diachronic metalearning are also expected to influence future learning experiences. At the same time, although the modus operandi of the classroom appears to be relatively known, routinely applied and unchanging, pupils express uncertainty as to what future learning will be like, both in terms of content and features of experience. It is for that reason that long-term planning is not devised or expressed, but pupils instead turn to their teacher and context for successful ways of navigating novel learning experiences (metalearning).

Chapter 7: DISCUSSION

A. Addressing the Research problem

My thesis on metalearning is based on the theoretical/paradigmatical proposition that metalearning, like learning, is situative, and therefore that specific learning environments construe and construct their own version of metalearning. This thesis is reflected in my statement of the research problem: Metalearning is, to a great extent, situative. What kind of metalearning happens in a specific learning environment?

Pursuing enquiry of this proposition on the empirical domain was actualised in a Year 4 classroom of a self-nominated learning-oriented school. In this case classroom of 24 pupils, I researched what metalearning pupils had constructed in and through the classroom in the past, and also how they construct metalearning in the present, with a view of using it in the future. The two distinct yet interlinked types of metalearning researched through participants' reflective accounts are diachronic and synchronic metalearning, which I have presented in Chapters 5 and 6 respectively.

Segment A of this Chapter is a summary presentation of the findings related to diachronic and synchronic metalearning. Additionally to summarising, the scope of this segment is to present and highlight the most telling aspects of the findings, which will constitute the basis of overall discussion in the following Segment B.

A.1 The research problem in Chapter 5 - Diachronic metalearning

Chapter 5 presents sample pupils' accounts of how they understand learning in the classroom. Pupils expressed their knowledge about the process they follow to learn about their own learning on two levels. Firstly, pupils described how they perceive their school and classroom to intend their learning to be like, or, more simply put, what the common experience of learning in their classroom is like. Secondly, pupils described their personal process of learning about how they learn in the classroom, and provided explanatory rationales for their personal approach to making sense of learning.

Pupils' diachronic metalearning is located at both aforementioned levels: that of awareness of how learning is constituted and then communicated by the classroom to its members; and that of personal interpretation of classroom learning and incorporation of sense-making into metalearning strategies for applying their self to the classroom learning. This chapter does not trace each pupil's personal metalearning, but rather aims to indicate the range of metalearning awareness and strategies as directly linked to those privileged by the classroom.

PART A: Learning about what schooling intends my learning to be like

Pupils began their accounts with the recognition of their classroom as a space in which they do experience learning. Through this admission, pupils recognized that their classroom experience is one of learning, and therefore the sense-making of that experience has grounded potential of resulting in metalearning.

Sample pupils continued their accounts with a description of classroom learning, which they derived from the sum of their experiences in this context. Classroom learning is provided in routines and sequences that pupils have to follow, and appears to each time aim towards arriving at a unique, correct answer. Pupils also described how learning in the classroom does not condemn mistakes, but rather promotes benefitting from them and improving one's own learning. One last, but essential element of classroom learning is feedback, which is provided both verbally and in writing. Pupils described feedback as balanced between formative (green bubbles, teacher's help, peer assistance) and summative (teacher given grades/levels), and as an important tool for motivating or initiating engagement with learning challenges.

In describing the structure and process of classroom learning, pupils also indicated that their following those structured methods and learning strategies that are prevalent in the classroom is regarded as a predictor and an indication of quality learning. Conjointly to the preference shown to classroom methods, pupils suggested an adherence to applying classroom learning attributes. These were described as the principles that support how methods and learning in general should be done and thought of in the classroom. They are also indicators of quality learning.

Summarily, classroom structures are understood through their effect on pupils' learning. Classroom mandates are therefore understood as affordances and constraints that impact pupils' learning.

PART B: Learning about how I learn in the classroom

Before explaining what personal sense they make of their learning in the classroom, pupils engaged in a discussion of what an experience of learning is to them. In their description of such experiences, pupils also explained how they derive and compile their criteria for classifying any classroom experience as learning.

An initial feature of a learning experience is the locus of control exerted for the learning to be accomplished. This locus was described by pupils as relevant to the sources of motivation for learning. Pupils discussed their learning being instigated by themselves, or being done as a response or favour to significant others. At this same level of describing and explaining experiencing learning, some pupils discussed having an awareness of the learning part of themselves being distinct from their whole self. They also discussed commanding executive action on that learning part of their self.

As far as cognition (thinking to learn- thinking about learning) is concerned, pupils mostly approached it through discussing how they choose methods to successfully complete learning tasks. Pupils suggested that there is an array of learning methods and strategies made available to them by the classroom, as well as an afforded opportunity for them to use methods learned outside the classroom, in other contexts, not, however, to substitute classroom methods, but to supplement them if applicable. Pupils also suggested that their criteria for selecting a method are almost always performance-driven (correct answers, improving speed, confidence/competence), and it is less likely that they will choose a challenging method to benefit their learning, but rather to demonstrate conquering a challenge to their teacher (also a performance-driven decision).

With regard to affect (what learning in the classroom feels like), pupils mostly discussed their feelings as they emerge in the challenge-confidence-challenge experience which learning usually follows in the classroom. The most vibrant feeling pupils related to their learning is that of confidence and/or competence, or lack thereof. Learning builds and reinforces feelings of

competence/confidence, and feeling confident/competent is a necessary precondition for engaging in challenges that further learning. Interestingly, competence is mostly experienced and judged as a feeling by pupils, and not as a cognitive process with set criteria. Moreover, feeling ready or not appeared to determine their use of methods and their involvement in further challenges. The impact of feelings in future learning was also evident in pupils' discussions of how feelings experienced in a specific learning episode, or lesson, or even subject, accompany and affect pupils' emotional state and performance in subsequent learning in different subjects/lessons.

The issue of motivation (motivating oneself to learn) was one closely linked to affect, since motivation is often experienced as a positive emotional state. An interpretation of sample pupils' accounts indicated that sustained motivation is habitually achieved through goal setting and goal striving which allows pupils to believe in their confidence/competence. Motivation was also discussed as the guiding force behind the way pupils interact with their context of learning, be that in the way they are influenced by it, or wish to influence it and assert their personal goals over those of the context. Such rationales for interacting with the context covered both short, but mostly long-term goals, with the latter approximating pupils' understanding of how they ought to apply themselves to learning to achieve what they believe the end goal of learning is. Finally, pupils discussed feeling internally motivated when they want to do learning to improve themselves as learners, and externally motivated when they want to prove their worth to others.

Last but far from least in importance within the pupils' accounts is the process of regulation, which was viewed as a constant concern for interaction with their context of learning (classroom). This interaction was described as having the aim of harmonizing with context-set or acceptable views of learning and with ways of applying oneself to learning. Applied regulation was mostly evident in pupils' discussions of decision making, which they discussed doing at specific time points during lessons, and through using specific cues from that context: objects/resources and peer and teacher feedback. A second important manifestation of pupils attempting regulation with the relevant framework of their classroom is when they make efforts to interpret classroom feedback/assessment with an aim of improving their learning. The effect of these efforts is not limited to making sense of feedback, but also extends to pupils' self-assessment. By endorsing the criteria, language, and methods of classroom assessment, most pupils appear to model their self-assessment on statements of judgment provided in feedback they receive in the classroom. Thirdly, it became evident throughout pupils' accounts that their

effort to regulate with their context (make sense of the demands of the context, take account of the affordances and limitations that impose on their personal learning, and respond to those demands through the way in which they achieve learning) implies a by and large endorsement and application of principles promoted by the classroom. Pupils' accounts highlighted that the principles that are most endorsed and applied after processes of regulation are the classroom's learning attributes.

Overall, the sample was divided in two categories with regard to metalearning awareness, knowledge and use: those who mostly described and rationalized how they learn by evoking classroom structures and routines, and those who predominantly discussed their personal rationales for applying themselves to learning as it happens in the classroom. Although not a watertight dichotomy, this emergent distinction was also evident in pupils' accounts of synchronic metalearning, as follows.

A.2 The research problem in Chapter 6 - Synchronic metalearning

Chapter 6 presents pupils' accounts of how they understand learning in narrower local and temporal contexts than that of the classroom. Pupils discussed their two core subjects of Literacy and Numeracy as having enough similarities to ultimately constitute classroom learning, but also to have enough differences to indicate that adjustment on the pupils' part is necessary in order to achieve learning in each subject. Pupils discussed adjusting to different subjects at two levels. Firstly, they described the affordances and constraints that are particular to each subject, and how those differences of context impact their collective experience of learning. Secondly, pupils discussed making sense of specific learning episodes in Literacy and Numeracy, by describing their learning experience and explaining the thinking process behind their actions to learn, their sense-making of each learning episode, and their intention to improve future learning through what they just understood about their learning.

As in Chapter 5, pupils' metalearning was evident in both parts of their accounts as described in parts C (descriptive) and D (descriptive and explanatory), meaning that metalearning knowledge and the metalearning process became evident in the choice of aspects of their learning experience pupils described, and in the way they rationalized engaging with those particular aspects of their experience. Even when called upon to discuss making sense of contexts that are narrower than the general, undifferentiated classroom, pupils structured their understanding

through listing and interconnecting the most influential features of the more specific context (be that a subject, a lesson or a learning task/episode, in order of specificity), and complemented their descriptions through explaining their personal rationales and the choices and actions through which they chose to express those rationales. Lastly, and most importantly, pupils' synchronic metalearning was evident in their stated intention of improving how they will apply themselves to learning in the future, and the specific changes to their existent metalearning strategy in view of new information derived by making sense of specific learning experiences.

Pupils' accounts of synchronic metalearning indicated that it complements their diachronic metalearning. In a cyclical process, pupils discussed activating and implementing aspects of metalearning strategies evident in their accounts of diachronic metalearning when experiencing learning that allows them to do so; they also discussed enriching their diachronic metalearning with elements of synchronic metalearning: this was evident in their strategizing for applying themselves to future learning. Both these by-processes of the cycle of metalearning appeared to be continuously influenced by the features of the context in which they happened, and only to a very small degree be independent from it. For example, pupils appeared to decide on applying themselves to future learning through improved use of already tried or classroom provided methods, or improved use of classroom cueing (teacher's instruction or peers' help) instead of relying on 'light bulb' moments and individual initiative alone.

PART C: Learning about learning in different subjects

The two issues pupils mostly addressed through describing subject-specific learning can be better understood through exploring their responses to the following two questions: 1- 'What is unique in lessons of Literacy compared to lessons of Mathematics?' and 2- 'What can pupils afford to do in one subject that they cannot in the other?'. As far as the first question is concerned, the comparison or rather juxtaposition pupils made between the two core subjects focused on two specific points that are crucial to shaping their experience of learning in these subjects. Pupils pointed towards differences in the procedural rigour and internal logic each subject was perceived to promote and be taught through. Mathematics was viewed as vastly more structured and constrained in the pathway pupils need to traverse in order to achieve learning, in this case viewed as a unique, correct answer. Literacy, on the other hand, was viewed as a context of learning that favours less structured methods, but that outbalances

rigour with more affordances for creative ownership and for allowing pupils a personal touch in the artefacts or texts produced.

The second matter, that of affordances and constraints, was mainly addressed by pupils through a review of the situational factors (affordances that the context provides) that allow them to regulate with the context. When reflecting on narrower conceptions of context, pupils indicated that the situational factors that influence their learning experience the most are time constraints, different demands for quality learning put forward by the teacher, and the different work settings preferred for each subject. The impact of the latter is further heightened when considering that different settings favour different interpretations of learning attributes, such as collaboration and independence, which pupils need to renegotiate in each subject, with each partner-peer, for each task.

PART D: Learning about how I learn through specific learning experiences

Metalearning on specific learning experiences was mostly expressed through pupils' metalearning reflection. Although each pupil described and explained metalearning through metacognitive and metalearning reflection on different aspects of his/her experience, and at different times, it was possible to set criteria for distinguishing between metacognitive and metalearning reflection in pupils' accounts. Specifically, metalearning reflection addressed learning as a holistic experience and not just as a review of knowledge, had a goal of regulation understood as balance, and was intertemporal in the sense that it interconnected the learning self in the past, present and future. In other words, learners discussed pursuing balance through continuity in their sense of the learning self: their present learning self was simultaneously aware of how their past self had been applying him/herself to learning and how the same learning self can conceptualise ways in which the future learning self can be improved. This notion of intertemporality is highlighted in Abbot's (1994) definition of learning, which could simultaneously serve as a definition of metalearning: '[Meta]Learning [is] that reflective activity which enables the learner to draw upon previous experience to understand and evaluate the present, so as to shape future action and formulate new knowledge' (in Carnell et al, 2000, p 4).

Pupils' reflective accounts were both descriptive and explanatory; they comprised, to a different extent for each pupil, by references and inferences related to subject knowledge,

the experience of learning, and the capabilities for learning that the learner potentially develops. Individual metalearning is traceable in the aspects pupils decided to highlight and the omission of those they wished to silence or habitually take no account of. However, elaboration or omission also depended on whether the task done (basis for the SRI) constituted a learning experience, in the sense that the learner judges they have achieved learning. If not, such an experience cannot (and did not) even potentially constitute an instantiation of diachronic metalearning or initiate a new cycle of metalearning because it highlights nothing new or different to the sense-maker.

Making sense of learning experiences provided through learning tasks in a classroom that is highly structured in its processes and routines makes it unlikely that radical changes or shifts in pupils' metalearning will occur. Regardless of the extent to which pupils presented themselves as having become knowledgeable in how learning can be experienced in the classroom, metalearning was seen less in descriptions of routine and more in reflections on change: metalearning is instigated by change and in turn initiates a changed way of experiencing both learning, and change itself.

Classroom pupils' accounts suggested that metalearning is spurred on and results in a qualitative change in the way they experience learning and apply themselves to learning. The qualitative nature of that change was evident in the pupils' understanding of change as improvement, which dominated pupils' discussion on applying themselves to future learning. Pupils' goal of improvement guided a process that included awareness of a new, different learning experience that has happened, realisation or sense-making of how this experience happened, and lastly conceptualisation of ameliorated approaches to learning in the future.

B. Addressing Metalearning Theory

A dataset on metalearning is of little worth, in my view, if it exists quiescent and unengaged in dialogue with existent theory in the field. Considering that this thesis is the first contribution of empirical data on classroom metalearning to pre-existing theory, I believe it is quite appropriate to follow the concise presentation of my findings with a segment dedicated to linking them with theorisations in the field. The scope of this segment is firstly to establish which theoretical propositions have been validated by my empirical study, and secondly to highlight those empirical findings which have emerged beyond existent theory.

B.1 Links with existent theory

In order to avoid repeating the bulk of existent theory on metalearning as it has already been discussed in Chapter 2, but rather engage the reader in a discussion on how this study has enriched theory, I will once again turn to the use of a guiding question. Paraphrasing Watkins (2015), I propose that a useful question to have in mind is: 'What more do we know about how learners come to know themselves as learners in a classroom?'. This question can be addressed by turning once again to the two foundational domains which existent theory and my original conceptual framework draw from: a. the relationship between metacognition and metalearning and b. the components of the process of metalearning with special focus on regulation and situativity.

B.1.1 Validation of the distinction between metacognition and metalearning

Firstly, it is worthwhile to turn to the central construct itself, and to review whether it is indeed metalearning that is present in the empirical findings and not metacognition. Starting from existing theory on metalearning, the construct itself has been discussed as varying in meaning between conceptualisations, with some theoretical frameworks positing it is a subordinate function of metacognition, while others arguing it should rather be conceptualised as superordinate, since it conceptualises awareness and control of cognition as one among a number of equally important components of the process of metalearning (vis discussion in Chapter 2). I have structured my own framework to belong with this second strand of conceptualisations because they are particularly tied to the field of Educational studies rather

than Psychology, and therefore propose a more holistic view of learning as a complex experience.

A first step towards understanding whether research on metalearning (conceptualised in this particular way) gathers and/or constructs data pertinent to metalearning or metacognition is to juxtapose the two contested definitions with empirical findings. Since it is metalearning that is the construct under development in this endeavour, I will focus this juxtaposition on metacognition.

Flavell (1976) proposed that

> Metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them. [...] Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or units on which they bear, usually in the service of some concrete goal or objective. (p.232)

Pupils appear to pay particular attention to cognitive processes, with emphasis on cognition as an acceptable way of thinking when involved in learning (e.g. solving tasks by using particular methods) and also when they reflect to make sense of their own learning. Cognition and learning, as well as their meta-components, emerge as most distinct in pupils' accounts of synchronic metalearning, or reflection on current/recent learning experiences-events-tasks. Pupils discuss thinking and developing personal rationales and courses of action pertinent to learning (the experience) more than they do for just for cognition (the thinking and knowing involved in experiencing). This can be tentatively attributed to the classroom promoting specific ways of thinking about thinking (methods for solving and for validating thinking and solving) in a routine way, which leads pupils to understand cognition as an aspect of learning they have little leeway in making sense of or directing by themselves or by itself. Nevertheless, pupils' accounts are not devoid of recognition of cognition and control over it, with their descriptions and rationales showcasing their tendency to temper and balance their cognitive states and perceived capabilities against affective, motivational, and contextual parameters of the situation in which their learning did/could/would happen. Simply put, making sense of one's own learning experiences requires more than thinking about one's own thinking and knowing, and also includes taking account of feelings and wants that are adaptable to suit the demands of specific learning environments. Finally, divergence from Flavell's definition of metacognition is

also grounded in the pupils' understanding of learning as not involving concrete goals, but rather as a process that involves continuous efforts of adjustment to learning contexts, which will eventually help them become who they wish to be as a learner.

A second step towards ascertaining whether it is metalearning or metacognition that has been made visible in this research is to review whether the methodological design for researching metalearning led to participants providing data on that, or on metacognition.

My conceptualisation and research design placed particular emphasis on the function, the process, and the value of reflection (Vis Chapters 2 and 3), which emphasis directly impacted my methodology. Pupils' accounts in their semi-structured interviews on diachronic metalearning and in their stimulated recall interviews on synchronic metalearning were produced with the aid of specific prompts, encouraging pupils to discuss their learning experience as widely as possible and to move beyond outcome-oriented or success attribution descriptions. Although these prompts were less necessary for helping pupils reflect on past learning and metalearning, they were used more extensively in helping pupils provide rich descriptions of synchronic metalearning. This might indicate that learners have a greater facility for discussing how they typically act across situations than holistically presenting how they do so in a particular situation, to paraphrase Biggs (1987, p 12). Nonetheless, my supporting prompts did not serve to extend the learners' focus of reflection beyond cognition specifically, which would suggest that this research does indeed address pupils' metacognition. As stated above, the structure of questions and prompts aimed to elicit richer rather than wider understandings of experience. Evidently, in the cases where a pupil’s understanding of their experience was quite limited, the prompts were of very limited assistance in eliciting wider understandings; if a learner did not associate learning with affect, for example, any and all prompts on affect did not challenge the pupil's view and lead them to discuss emotional states and their influence on learning. It is therefore relatively safe to assume that the methodological tools used, their structure and administration allowed pupils to discuss learning in a way minimally pre-determined by the researcher, and to steer their accounts in the direction they felt was more representative of their personal experiences and views. In that sense, methodology was aimed at metalearning, but proved to be simultaneously open enough to allow pupils whose learning experience is dominantly metacognitive the freedom to limit their descriptions to that. Pupils' predominant choice that emerged within this methodological design was to discuss metacognition as a delimitated component of metalearning, since their thinking about knowing, knowledge, and learning was insufficient in itself as a medium of describing their learning and sense-making of

learning. Instead, pupils' accounts included (each, of course, in varying degrees) articulations on thinking, feeling, wanting, heeding cues from the context, and striving to orchestrate all these to achieve and improve learning. Again, the scales tip in favour of metalearning emerging as superordinate to metacognition in empirical data.

In both the scope of matching definitions and in that of reviewing the influence of methodology, metalearning appears to be that construct which emerges from this conceptualisation and empirical study. However, the conversation for clearly distinguishing between the two constructs runs through my entire discussion of findings, which is a consequence of them both being meta-components pertinent to the same process of learning, and theoretically and empirically shown to overlap.

B.1.2 Learners' sense-making of learning

Continuing the conversation on 'what more we know about how learners come to know themselves as learners in a classroom' requires moving beyond the substantive, yet mostly political issue of distinguishing between metacognition and metalearning, and into the crux of the matter: the process of metalearning, and its relation to the context in which it happens, namely the classroom. Since the focus of this segment is on matching empirical findings with existent theory, particular emphasis will be given to how the theoretically seminal notions of regulation and situativity emerge in the findings, and to how they inform theory on the process of metalearning and on context respectively.

Briefly, what has been theoretically established regarding regulation and situativity is that they rise from quite recent shifts of epistemological perspective, moving from more cognitivist views that conceptualise regulation as a personal capability for 'mobiliz[ing], direct[ing], and sustain[ing] one's instructional efforts' (Zimmerman, 1995, p 217) and as such pay less attention to situation- specific parameters and more to modes of thinking, knowing and learning that are generaliseable across individuals independently of context. As discussed in Chapter 2, the transition from cognitivism to constructionism and then on to critical theories, which followed the epistemological views of the field of Education rather than Psychology, created a wealth of new conceptualisations for regulation. Although still closely associated with cognitivism (E.g. SDT theory, Bandura's work, etc), more flexible views of regulation have led theorists to describe it as a complex mechanism that allows learners to manage their internal dispositions

towards learning and to balance those with the demands of a specific social and physical environment for learning. Conceptualising regulation as a mechanism for two-channel communication with one's context means proposing that learners influence and become influenced by their context, with the power balance determining the direction of the message depending on that same context.

In line with this theoretical background, my own theorisation builds on the existent proposition that metalearning can be viewed as a learner's facility for utilising past experiences of learning in order to effectively and sustainably learn in new contexts of learning. Theory has proposed that utilising experience to learn means making sense of it and using it to direct oneself towards effective, sustainable future efforts to learn. It also proposed that this happens through the regulation of components of the personal experience of learning to the way in which the context presents and actualises learning. Nevertheless, lack of empirical data has limited theorisation to suggesting principles that should be occurring or be activated by learners, should the situative circumstances allow for it. Summarily, metalearning has been delineated as a process that involves learning-oriented (as opposed to performance-oriented) individuals, who make sense of their situated experiences (how/when is unknown), and are motivated to construct themselves as learners by harmonising personal cognition, affect, and motivation with those conceptions of cognition, affect, and motivation that the context privileges (for an extended discussion, vis Chapter 2). My theoretical proposition is that the role of the context is more important than that already discussed in previous theory, and that learning and a learning orientation/focus on learning is not a universal notion that learners perhaps unknowingly adhere to, but it is prescribed by the context. Classroom learning constitutes the background of pupils' experiences, and more or less implicitly directs pupils towards making particular sense of their experiences in it by privileging or silencing/overlooking pupils' sense-makings that are deemed incongruent with it. In that sense, all pupils who experience learning can be expected to also metalearn, independently of a personal learning or performance orientation, because metalearning is promoted by the situation. Since each classroom is proposed to be a unique version of metalearning, the pupils' metalearning will take a form of effectively understanding and strategising to succeed on whatever the classroom suggests that learning is. This proposition moves beyond understanding learning as something abstract and standard, and to rather suggest that it is the property of a context, or a community.

The classroom as a signposted context

Indeed, my empirical study into metalearning in a classroom validated both existent theory and my own propositions by showcasing that the structures, rules, and rites of the classroom have a strong impact on how pupils make sense of their own experiences of learning. The influence of the context of learning is evident both on the process pupils follow to make sense of their experiences as well as the outcomes of the process, their metalearning knowledge. It is important here to differentiate between metalearning knowledge and competency; competency (a state of capability) cannot be achieved without knowledge, and producing metalearning knowledge cannot be achieved without a degree of competency which guides the process of knowledge construction. The sense-making process appears to be continuously informed by either deliberately given or perceived cues in the classroom, about what pupils can or cannot do to learn. Either way, pupils refer to, or infer from a specific framework of reference to justify their personal understanding of learning.

The relevant framework or framework of reference, or, simply put, the classroom, communicates the meaning of learning (what it is and how it should happen) through specific signposting that is perceived and interpreted by pupils. Implicit in that signposting appears to exist a choice architecture that comprises the classroom as a system of meanings which pupils are invited and/or choose to make sense of in order to learn about their own learning. This is -in various degrees- actively and overtly presented to pupils during classroom learning, and also in more or less nuanced ways. The more overt and thus collectively apperceived signposted meanings emerge through pupils' descriptions of how their classroom operates in regard to learning (how learning happens, routines, demands/affordances to learners), whereas the more nuanced signposted meanings that require some personal processing emerge in pupils' personal rationales for deriving the meaning they do from learning in the classroom. This finding is in line with Marton and Booth's (1997) claim that all accounts of learner experience express, in various degrees, what is learned, how it is learned, and the specific ways in which what is learned advances personal learning and knowledge (vis Chapter 3 for discussion). The same finding is also in line with the theoretical suggestion that metalearning can simultaneously mean a. teachers teaching for development of awareness and control of processes activated during learning (knowing, thinking, feeling, producing) and b. the learner's effort towards effectively developing his/her learning including responding to the teacher's stimulation (ibid, p. 26), although this research suggests that it is not necessarily through direct and targeted teaching

that a classroom format of metalearning is communicated to learners, but that the pupil's response to that implicit format is indeed necessary for metalearning to occur.

An empirical confirmation of these existent theoretical propositions in the context of a classroom emerges in this study through pupils' responding more strongly to the following features of classroom learning, and deriving the most sense from them in regard to how learning should be done and experienced.

The first of these is those occasions in which the ways in which learning should be done is expressed directly and overtly in the classroom. These can include the teacher directing towards the use of specific methods for learning and solving, specific routines that need to be followed for (the classroom conception of) learning to happen (for example suggesting that learning happens in alternating stages of challenge-confidence), and also specific cultural rites that need to be observed for the accomplished learning to be of value (in this research these are the learning attributes, which encourage pupils to learn by using specific principles that add a dimension of quality to learning).

Inadvertently, pupils validate Watkins' (2001, 2015) suggestion that metalearning could be promoted through 'mak[ing] learning an object of attention' and 'mak[ing] learning an object of conversation'. However, emphasis on the deliberate action of 'making' is not a necessary precondition for pupils to make sense of what the classroom wants them to understand as learning. That means that the existence of a context is by itself the necessary precondition for learners to engage in making sense, and that it is an object of attention and conversation anyway.

The second is classroom learning goals. Pupils perceive that the classroom is oriented towards them achieving some goals more than others; for example, correctly arriving at a unique solution appears to be more valued than personal expression and creativity. Although these two types of goal are associated with specific subjects, and could therefore be attributed to subject pedagogies and as such to be beyond classroom control, some goals appear to be consistent across subjects. Arriving at a correct answer by following pre-set routines and rites in order to ensure quality is regarded as a standard classroom goal, which pupils suggest allows the teacher to assess their learning in a faster, more efficient, more objective way, and provide feedback on it.

Although more subtly manifested than Dweck, Watkins, and others have suggested, classroom goal orientation seems to mean to the pupils that specific sense must be made of learning in the classroom. What is particularly interesting is that pupils exact a more accurate sense of what classroom goals mean to their personal learning than that which the classroom officially claims to have on those. This project was done in a classroom that prided itself in being learning-oriented, yet pupils suggested that this orientation matched less the sum of attitudes theory classifies as a learning orientation, and more that what this particular classroom conceptualised learning to be like, which spurs further need for sense-making.

The third is classroom language and material signposting. Another locus in which learners locate the classroom's conception of metalearning is that of direct communication, both linguistically as a social aspect of the context, and materially as a physical aspect of the context. Classroom signposting is predominantly communicated through language describing learning in verbal (instruction, direction, peer collaboration, feedback) and written form (feedback, assessment, task descriptions). This can be viewed as the semantic structure through which the framework of reference is communicated to and between classroom participants. An additional source of sense-making appears to be the physical, material classroom, in the form of the variety of instructional resources made available to pupils and their availability, which depends on the subject, the type of task, the mode of work (individual/collaborative), the use of learning attributes, etc.

Signposting through communication has traditionally been theoretically described by Assessment for Learning (Dann, 2012; Hughes, 2014, etc) and by Situated Learning (Higgins, S. et al 2005; Edwards, A., 2005, Volet, S., 2001, etc). Nonetheless, communication as/for signposting appears to also emerge as relevant to metalearning, as a. it makes learning the object of attention and conversation (Watkins, 2001, 2015) and b. it allows pupils to make sense of how they can benefit from classroom learning to advance their personal learning and knowledge (Marton and Booth, 1997).

Although this aspect of classroom signposting does match existent theory, it also exceeds it in the role it plays in shaping metalearning styles and identities. Additional theorisation follows in segment B.

Making sense of the signposted context through reflection and regulation

The existence of signposting as a framework of reference (constituent rules of a context participants directly refer to) naturally raises questions as to why and how that framework is constituted, as well as in what context reference emerges and/or becomes necessary. Existent theory suggests reflection is linked to 'learning strategy awareness' (Stephens and Winterbottom, 2010), 'facilitated planning and monitoring' (Conner and Gunstone, 2004), and 'gaining insight into one's ability to learn intentionally' (Brown, 1997). Moreover sense-making, particularly post-hoc, has been strongly linked to reflection in metacognition and thinking taxonomies literature (Moseley, 2005). However, reflection has also been linked to metalearning, partly because it conceptually emerged through metacognition and therefore borrows a lot of its basic principles, and partly because reflection is firmly grounded on experience, a foundational pillar of metalearning. A situated understanding of reflection therefore addresses the issue of the framework of reference: making sense of an experience requires making references (and inferences) to the situation in which that experience occurred. Thus, it could be claimed that a framework of reference is constructed by learners specifically for the purpose of reflection conceptualised as systematic thinking aimed at understanding in relation to specific pointers.

This research has indicated that a distinction can be made between metacognitive and metalearning reflection. Although this distinction does not contest the cognitive nature of reflection itself (this lies beyond the scope of this research), it does contest that all reflection on learning is metacognitive. Specifically, while all reflection on cognitive processes (thinking and knowing) can be the object of metacognitive reflection, when the object shifts to learning as an experience comprised not only of cognition, but of affect, motivation and situational parameters as well, its scope exceeds that of metacognitive reflection. Thus, metalearning reflection emerges as a process encompassing wider aspects of the learning experience.

This research suggests a normative description for metalearning reflection, which includes the following characteristics: a. the learner perceives learning to have taken place, b. the learner has the facility to assess the achieved learning against personal or personally endorsed external criteria, and c. the learner can identify ways in which the learning achieved bridges past and future learning.

In comparison to metacognitive reflection which includes planning, monitoring and reviewing learning strategies and knowledge, metalearning strategy is based on awareness, self-assessment, and using metalearning knowledge to strategise. Further discussion on applied metalearning reflection is found in the next segment on applying oneself to learning and metalearning.

Conceptualising metalearning reflection as a process aiming at insightful understanding is too vague a proposition (made in existent theory and in my own conceptualisation) without some discussion on what this reflection aims to understand. The fact that it addresses insightful understanding and not just creative envisaging, for example, leads to the conclusion that reflection is grounded on experience, and by extension, the context of learning in which experience occurs. The person-in-context's understanding of experience suggests a double scope of reflection: deriving and building insights on the context and the learning self. A process of reciprocally informing one's understanding of the context through better understanding of the self and vice-versa also suggests the existence of a mechanism of transference of insights and understanding between the two. This research confirms the theoretical proposition that regulation can be that mechanism used by the learner for enriching their insightful understanding of themselves as learners and the context in which they experience learning.

More specifically, learners' understanding of the context as a signposted field of activity (structured in a way that conveys some sense of how it should be understood and how a learner should apply themselves to learning within it) becomes evident through their structuring their discussion of it through the combined use of references (direct descriptions/attributions) and inferences (informed surmises). This suggests that there is sense that is derived and sense that is made, and that learners use both (in varying extents) to form insightful understanding of learning in the classroom. Forming, or striving towards a balance between prescribed and self-constructed meanings appears to be the main function of regulation, in the sense that the maintenance of effective balances or the improvement of ineffective ones must have a homeostatic value (relatively stable equilibrium between interdependent-regulated aspects). In other words, maintaining or achieving an effective way of understanding learning and applying oneself to it is contained within a range of understandings that will not completely disconnect classroom and personal notions of effectiveness, but rather harmonise and conciliate the two.

The effort of harmonising (regulating) one's sense-making with that conveyed by the context is also subject to the power balance between context and person as it is seen in learners'

perceptions of freedom from boundaries. Complete lack of boundaries in sense-making would imply a classroom that is minimally structured (a rare phenomenon in systematised education) and which imposes no limitations on how pupils conceptualise learning and apply themselves to it. Nevertheless, a more pragmatic view of classrooms in this research indicates that structures convey an idea of boundary as delineated by affordances and constraints, or ways in which one is allowed to understand learning and apply oneself to it, and ways which are not acceptable. Metalearning therefore is bounded by the way in which the classroom promotes or silences pupils' emergent ways of understanding learning and applying themselves to it.

Learning about applying oneself to learning, learning about improving the learning self.

Despite the fact that theoretical descriptions of the process of metalearning as learners apply it in the classroom have been generated (Stringher, 2014 for a review), they mostly constitute suggestions or proposed interventions for introducing and encouraging metalearning in the classroom rather than describe it as a naturally occurring phenomenon (vis Chapter 2). Although my research does not refute that learners can become better metalearners, it is not aimed at assessing interventions or successful strategies for teaching (for) metalearning, but rather at elucidating the learner's perspective on making sense of their experience of learning.

A description of in-situ, applied metalearning in this research highlights three core aspects of metalearning: a. aspects of the experience of learning learners use to metalearn, b. the process which metalearning follows, and c. the existence/modification of metalearning strategies.

Watkins' (2001) conceptualisation, those compiled in Strignher's (2014) review, and the one by Marton and Booth (1997), converge in proposing that the experience of learning includes cognitive, affective, motivational and situational features, and that learners who discuss making sense of their experience are likely to discuss it through a combination of these. This research showcases that these theorisations do apply to Primary learners, who, as seen in both results Chapters and the summary at the beginning of this one, described understanding learning but also themselves as learners. Learners appear to indeed understand their learning as complex and multifaceted, and to perceive knowing/knowledge, feelings, rationales/goals and the

affordances and constraints of the classroom as input channels, or sources of information available to them to process in order to make sense of their experience.

What this research adds to metalearning theory is a stronger emphasis on the relationship between experience and sense-making, which is grounded on the fact that not all learners discussed their experience through all the theoretical components of an experience. In fact, each learner's range of experience varies significantly from everyone else's, with some perceiving and describing much more than others, depending, always, on the nature of the experience itself and what it requires of the learner. Simple tasks of computation are more likely to be experienced and described as involving knowing/knowledge than more complex tasks, which require the learner to be more involved. This finding raises issues about each learner's 'competence' (see Chomsky below) of experiencing, and about the quantitatively different ways of experiencing (between pupils) leading to a quantifiable range of metalearning competence in the classroom.

Turning to Chomsky's (1957) understanding of it, competence is taken to mean the 'competence to experience various phenomena in certain ways, a competence that reflects changing person-world relations and that evolves as an aspect of experience. It is thus born of learning' (cited in Marton and Booth, 1997, p 135). So even though classroom studies of metalearning (making sense of experience) are likely to indicate towards a quantifiable range of competence between pupils of a classroom (a central idea in Marton and Booth, 1997), an individual pupil's process of learning through experience reflects qualitative changes in the way in which they experience learning (Chomsky, op cit). In other words, each learner in a classroom develops their sense-making and experiencing in a unique, qualitative way guided by making different sense of their experiences. At the collective level of the classroom, however, these qualitatively different paths to sense-making and experiencing are comparable to each other and reflect a person's capability of making sense of more or fewer aspects of their experience. This conceptualisation upholds the empirical finding of some pupils constructing richer accounts of metalearning than others, and as such can be viewed as potentially more capable metalearners. However, the ipsative course of improvement as qualitative change alludes to equally 'capable' sense-makers producing different sense of their learning, based on previous knowledge and wealth of experiences. This issue appears quite important, but lies beyond the scope of this present research which is limited to highlighting the issue of competence without being able to trace it to its roots.

Findings consistent with theory on metalearning and situation awareness also emerge on the process which pupils follow to make sense of their learning experiences. Burch's (1970) model of learning as incorporated into Watkins' (2001) cycle (vis Chapter 3) suggests that learning as sense-making follows a course from what is known (knowledge created in past experiences) to learning more about it (learning about learning/ gaining insights from present experience) and finally towards enriching past metalearning knowledge with those new insights deemed likely to improve it.

Pupils' descriptions of their sense-making process do fit Watkins' cycle, but shed more light on the learning about learning stage of the cycle, by which I mean the exact point at which present experiences are converted into knowledge about learning (via sense-making), and feed back into previously constructed knowledge about learning. Researching both knowledge about learning constructed in the past (diachronic metalearning) and insights (potential knowledge) constructed in present learning experiences (synchronic metalearning) led to the confirmation of the constructivist principle that new knowledge is firmly grounded onto past knowledge, even when the object of that knowledge is meta (concerns knowledge itself).

Learners' views on the process they follow to achieve learning about learning fragmented insights into informing past knowledge with new insights, in order to transform it (in case of radically novel experiences) or to improve it (in case of learning experiences reflecting some continuity in content (whereby learning is the direct object) or the structure of the experience (whereby learning is the indirect object)). The intensity of the experience and the learner's competence in experiencing, which were discussed above as relevant to experiencing, are here also linked to the construction of knowledge based on that experience. Indeed, learners suggest that they (more or less intentionally) use reflection as a tool of retrieval, review, and assessment of relevant diachronic metalearning knowledge, and that they also use reflection to sieve through cognitive, affective, motivational, and situational understandings of their current learning experience in order to improve diachronic metalearning.

This process of continuous, iterative and cross-fertilising improvement is a very good fit for the descriptions of Situation Awareness (Endsley, 2015) discussed in Chapter 3. Although not too different from classic constructivist views of expanding one's knowledge base through experience, Situation Awareness (SA) hones in to the influence of the context on directing the individual to experience it in particular ways and thus construct particular meanings and knowledge from it. Most importantly, I posit the highest conceptual congruence between my

research findings and SA theories on the principle of intertemporality, understood as the sense of continuity possessed and maintained by the learner in regard to what learning means and who they are as a learner. So, as Situation Awareness describes individuals activating past dispositions to apply themselves to the situation in a particular way, and derive new insights as to how effectively they did that, so does metalearning describe how learners activate past knowledge about who they are as learners and how they have applied themselves to learning thus far (diachronic metalearning) and then derive insights about the degree of effectiveness of these past understandings. The significance of classroom metalearning as according with Endsley's conception of SA lies in understanding metalearning as a process necessarily and fundamentally grounded in context. As such, navigating contexts through experiencing is what triggers-activates-supports metalearning, and not an abstract, philosophical endeavour towards introspection (at least not at Primary level, as seen in this research).

The influence of the context/situation as seen both in SA and constructivism is also evident in that learners reference and infer sense-making from those specific aspects or events in the classroom which I previously discussed as signposting. Pupils predominantly do that through the detection of 'good examples' (in the sense of representative and helpful) of learning, to which they anchor their sense-making efforts. However, pupils extend their sense-making grasp, so to speak, beyond good examples, and endorse the whole range of examples that the classroom presents to them. In other words, pupils model their learning but also their sense-making on the classroom's matrix for it, and as such regard as a good example any example endorsed by the classroom. As a result they then produce descriptions of how they are meant/should be learning, and rationalise their applying themselves to learning in particular ways to it being imparted to them either directly, or by the force of routine ostension and application.

Common in both frameworks and in my research is the premise that learners are likely to learn but not learn about their learning through situations which require them to apply themselves in very similar ways. Participants indicated that active sense-making is superfluous in situations (lessons, tasks, etc) in which the sense they made in the past is still valid and allows them to navigate those experiences with ease. Pupils are therefore, through these experiences, likely to grow as learners (of curricular knowledge where learning is the direct object), but less likely to grow as metalearners, and understand how they apply themselves to learning (indirect object of learning). In their accounts, they suggest that they tend to recollect what sense has been made or was imparted to them when they first entered the context (reminder: the school in question has a standardised way of viewing learning across Years). Recollection, however, is not exclusive

to personal sense-making, but also classroom-given sense, which results in pupils' understanding as a reflection of a conglomeration of the two, with the initial distinction lost in years of similarly structured experiences.

Understanding an experience of a regulated context as structured, and, by implication, the sense making inferred from that or modelled on it as also structured, can easily invoke notions of inescapable determinism and erasure of the self. It is however evident to educationalists, classroom practitioners, my research participants, and me as a researcher that it is not so, and that contexts of all degrees of regulation afford space for the learning self to invent and construct itself as such. What changes between differently regulated contexts is the balance between affordances and constraints that are made available to individuals. This directs my discussion back to the issue of the signposted classroom, and how it conveys or imparts a choice architecture to social participants, who can choose to follow the signs, or design their own route towards achievement and effectiveness.

According to Collins (1996), effective environments are designed around their 1. goals; 2. learning style; 3. sequence; and 4. methods. Indeed, participant pupils include all four principles in their accounts, denoting that the classroom in question is effective in Collins' sense. Conveying a particular sense of learning through these principles with the purpose of providing relevant examples, can be seen as strategic structuring, which allows for a view of the classroom not just as a signposted field, but a metalearning chessboard: although the same rules and regulations apply to all learners, each plots their own course across it, by setting different goals for themselves, having different attitudes towards learning, and by using a different arsenal of learning methods. Each learner navigates the chessboard of the classroom by directing themselves or being directed to use ends, ways and means (vis Chapter 3), through a continuous process of more or less consciously made choices.

Now to directly address my research problem, I reiterate that there does indeed appear to exist a version of metalearning (how one can/should learn about learning) that is the property of a classroom/learning community. Moreover, the learning environment appears to be understood as strategically structured and as promoting specific effective ends, ways, and means in regards to what learning and the learning self should be understood as. The specific combinations of ends, ways, and means that are in play are understood as affordances and constraints, a more direct way of communicating to participants what is acceptable and what is not in terms of

learning and being a learner. Classroom metalearning strategy is in other words embedded in classroom design.

This research on participants' voices also addresses the research problem through a bottom-up approach, aiming at showcasing that Primary classroom learners do have a strategic understanding of learning in context and of applying themselves to learning. Each learner does therefore have a sense of who they are as a learner in their classroom, and how their personal learning is happening, which they try to balance with the classroom's idea of who they should be and how they should learn. This is illuminating because thus far, metalearning has been discussed as a capability of the individual for higher-order thinking that is imposed on learning contexts, while this research conveys the learners' view that the structure of contexts is also conducive to their shaping and developing metalearning in particular ways.

A footnote, but an essential one nonetheless, is that both the classroom and the individual learner construct metalearning strategies and not plans. Both the classroom and the individual follow open-ended designs, allowing for flexibility in the setting of ends, ways, and means, and developing through feedback derived from new classroom learning experiences. In that sense, both classroom and personal metalearning are in constant dynamic, cross-fertilising, dialogic development that is both temporally and locally bound, but also exceed the physical and social constraints of a classroom and a community due to having roots in other contexts (e.g. school, community, a learner's family, an individual’s personal make-up, etc), and aiming to improve and develop learning as a way of achieving future access in other contexts (e.g. jobs, more senior Years, etc).

So, to summarise, this research matches existent theory on metalearning by empirically validating the components of the metalearning process, and their cyclical process of application by the pupils. The added focus on situated metalearning in a classroom also allows this research to provide additional scopes to existent metalearning theory, or added emphases. Phenomenographic conceptions of learning and awareness complement metalearning theory in describing how and why the range of learners' experiences and sense-making manifests in a specific learning environment, and Situation Awareness theory lends a sharper focus to the structure and flow of the specific process pupils follow to make sense of classroom learning. Awareness theories also complement metalearning in further elucidating how past metalearning (diachronic) feeds forward into present metalearning (synchronic) and is informed

and improved by it, with this theoretical extension being highly useful in future methodological explorations on metalearning.

A succinct review of the major findings on classroom metalearning points towards two levels of metalearning at interplay: Classroom metalearning structures (upholding the classroom version of metalearning) actualised through routines, rites, and communication media, and personal metalearning strategies constructed through diachronic and synchronic sense making with a view of improving future learning.

B.2 Extending theory

Addressing the research problem requires highlighting and describing those aspects of the classroom that pupils suggest as chargeable for directing towards or allowing for their metalearning in the classroom. Such an approach also facilitates a discussion on the implications of understanding metalearning as pupils do. Thus far, person-centred conceptualisations of metalearning have been regarded as a medium towards improved performance (Watkins, 2001, 2010, 2015) and sustainable life-long learning (Deakin-Crick, Stringher, Ren, 2014). My research proposes that metalearning is also an appropriate platform for understanding how a community of learners (and each of them individually) produces and ascribes meaning to their shared activity of learning. The significance of such a proposition lies in the extension of theory to include three foci that emerge as key to situated metalearning: the link between metalearning with sense-making and meaning-making, the relationship between classroom language and metalearning, and the development of metalearner typologies on the basis of agency and engagement.

B.2.1 Metalearning as making sense of and making meaning out of the experience of learning

In Chapter 3, the concept and process of sense-making was discussed due to its core value in the basic definition of metalearning: 'If learning is the process of creating knowledge by making sense of your experience, metalearning is the process of making sense of your experience of learning'. (Carnell et al, 2000, p. 5). Underpinned by this definition, my research on classroom

metalearning located pupils' sense-making of/in their classroom, and of themselves in relation to that classroom. Furthermore, sense-making was linked to processes of regulation and capabilities of awareness (see previous segment). Making sense of something or someone, in this case the classroom and one's learning self, is a process of interpretation, and therefore likely to be unique to individuals, even when their sense-making has the same object (i.e. the classroom, or how learning should be done). Marton and Booth's (1997) phenomenographic approach to sense-making, which my own research aligns with, supports that this interpretative aspect of sense-making is what leads the development of metalearning through qualitative changes. According to those same theorists, sense-making guides change through two major routes: a. sense-making can lead a learner to reconfigure, completely change, acquire-endorse, or complete already existent ways (in themselves or their context) of experiencing learning, and/or b. through sense-making, a learner acquires the capability to discern additional aspects of learning which they could not before, and be focally, or simultaneously focally aware of newly acquired and previously known aspects of their learning.

Both these routes to developing and improving metalearning through sense-making were evoked by my research participants, whose keenness to envisage applying themselves to future learning in an improved way divulged their interpretation of what classroom learning is like and will be like in the future.

However, when it comes to pupils' descriptions of personal metalearning as an effort to interpret and envisage themselves as learners, I found 'sense-making' to often be quite inadequate a term for encapsulating what pupils were expressing, which came closer to meaning-making. Reference has been made to Vygotsky's distinction between sense and meaning (vis Mahn and John-Steiner, 2013, Chapter 3) with sense being the aggregate of a specific situation, and meaning being 'a comparatively fixed and stable point, one that remains constant with all the changes in the world's sense that are associated with its use in various contexts' (Vygotsky, 1987, p. 276). Vygotsky also posits that there is a relationship between the two, with sense being 'a transformative component in the development of the system of meaning' (Mahn and John-Steiner, 2013 p. 132), or, more simply put, the self.

Referring back to classroom metalearning, sense-making is indeed used by pupils to derive understanding from learning as defined by the classroom, a process made only clearer by them clearly stating that learning means different things in their home, or extra-curricular projects for example. Nevertheless, they have a sense of their learning self as continuous and intertemporal,

extending far beyond the regulatory boundaries of the classroom or any context, and which they enrich through making sense of the classroom (among other contexts). This is particularly evident in their strategising for the future, in which emphasis on an improved learning self overshadows that on improving their understanding of the context. Although this finding could be attributed to them knowing they will spend three more years in the same context which they already understand, their interviews clearly reflect their prioritisation of development of their selves as learners.

Also in support of adhering to the Vygotskian distinction between sense and meaning is the now empirically confirmed conceptualisation of the relationship between synchronic and diachronic metalearning. Whereas the former is firmly situated on specific learning experiences, the latter appears to form a more stable bank of knowledge about learning and attitudes to it, which learners selectively activate as a result of making sense of situational demands.

A third point of conceptual differentiation between making sense of and making meaning out of learning in the classroom is the locus of the act of making in terms of awareness. In other words, are sense and meaning products of intentionality? Are they made, or derived? This is important for understanding the relationship between the two concepts, beyond the Vygotskian distinction above. In this research, findings suggest that it is possible for making sense to be done both intentionally (deliberate interpretation of the framework of reference) and intuitively (routine adherence to past understandings). However envisaging one's future learning self and strategising for its improvement, as pupils do, presupposes intentionality. In that sense, making meaning is an intentional process. Metalearning is making sense of one's own learning in order to create meaning out of it, and therefore includes both intuition and intentionality.

Making all these distinctions raises the question of metalearning being more pertinent to meaning making rather than sense making. The insight this research can provide on this matter is that pupils as young as those in the sample have experienced and made sense of relatively limited contexts, with their most extensive one being that of their classroom and school, which are fairly consistent and standardised in the school in question. As a consequence, the meaning each pupil ascribes to learning could be strongly grounded on what meaning this particular context ascribes through designing the regular, repeated, and regulated experience and sense-making.

All the above aspects of distinction between making sense and making meaning in regard to metalearning could feed back into Carnell et al's (2000) definition, and extend it to include the indirect outcome of metalearning as one that relates to meaning: ‘If learning is the process of creating knowledge by making sense of your experience, metalearning is the process of making sense of your specific experiences of learning in order to construct context-mediated meaning about them’.

B.2.2 Classroom language and metalearning strategies

The way in which pupils discuss classroom learning and personal learning and the way in which they structured their accounts highlighted that the classroom has and propagates a particular linguistic and communicative idiom in regard to learning. More specifically, the language learners used to describe and make sense of the routines and rites of classroom learning was highly consistent with that used by the teacher and the school. Learners therefore constructed their own understanding of learning by modelling it not only on structures, but on the meaning those structures carry. This chimes with Wertch's (1985) view that 'semiotic rules [language about learning, symbols/objects, types of interaction] provide a system, spatially arranged, to assist the individual who is engaged in mediated action' (in Mahn and John Steiner, 2013, p 124)

This finding can be attributed to the overall ethos of the school which places particular value on promoting learning and adopting a learning-oriented language. As such, a particular language about classroom learning is standard across classrooms and strongly evident in everyday classroom life. What is particularly interesting in this research is that participants' views clearly indicate which areas of classroom life the school understands as learning, through their use of the exact same vocabulary the school and classroom use to signpost that. An interesting example is the multi-purpose use of the word learning for being in the classroom, working in the classroom, direct instruction by the teacher, individual work, homework, and so on. It was therefore relatively unsurprising that when pupils were asked to reflect on and discuss their learning, they found it quite difficult, and thus began their accounts of classroom learning by directly referencing the structures of the classroom, by virtue of them being specific and communicated to them by teachers and peers through specific vocabulary. In that sense, classroom learning is better understood by pupils than individual learning. The role of language in what sense pupils make about what counts as learning was never more starkly obvious in this

research than in pupils' discussions of affect in learning. Where routines, principles, thinking and work were mostly talked about through the use of classroom language, the lack of any classroom language (and as such of a regulatory framework) on feelings was reflected in pupils' vastly more varied vocabulary and mode of expression, which was much more vibrant, and allowed them to shift the focus of the descriptions from classroom to personal learning. It also allowed pupils to become more specific in the information they provided through inferences and references, because the grammatical/semantic choice of ascribing the word learning to more than one object no longer applied.

This finding raises the issue of the extent to which the existence of a specific classroom language and vocabulary allows pupils to access the sense that the school and teacher intended the classroom to have when they constructed/endorsed the language. A particularly telling finding was that although strong regulatory language was in place in the classroom, it was not connected to or translated into specific actions, sequences or rules. The classroom's learning attributes (perseverance, focus, curiosity, reflection etc) were communicated as principles to be implemented in order to achieve 'good' learning, but a 'standard' mode of implementation was not presented to pupils. What pupils' accounts disclosed is that in circumstances in which they could not attribute success, failure, or could not make specific sense of the experience they just had, they attributed that disadvantageous state to 'bad' implementation of one or more attributes without being able to explain why they chose that particular attribute and how their implementation of it was defective. This finding resonates with Vygotsky's caveat that the 'child's world may correspond with the adult's in object relatedness, but not in meaning' (1987, p 153), since the adult constructors of the semantic framework highlighted and signposted important principles pertinent to learning through language, but the young learners in the classroom have not yet made concrete sense of what these principles should or do mean for their learning, due to their still limited and relatively unvaried experience with learning.

Emphasis on how strongly classroom pupils rely on classroom language for making sense of the classroom and themselves as learners in it and then for modelling all further sense making of learning on that, creates a question that may be beyond the scope of this research, but is partly answered by it: is a strong regulatory language helpful and conducive to metalearning, or would linguistically unregulated contexts support sense-making more effectively?

The strong situativist position upheld in this thesis in regard to metalearning and by extension to sense-making and language could be formulated as an argument towards neither type of

'language' being conducive to better metalearning, but towards each of them supporting a different version of metalearning. In Torbe's (1986) understanding of classroom language, each of these language varieties promotes a different linguistic repertoire that is the sociocultural property of the community that uses it.

In line with wider educational, sociological, and psychological work on classroom learning and language (Bernstein, 1965, 1996; Vygotsky, 1987; Marton and Tsui, 2004), the line of thought dominating education in the aspect of language is that expressed by Kress (1982), who has suggested that 'formal, 'generic' language styles can actually hinder active, creative, exploratory thinking by making the student servile to the linguistic forms in and through which learning takes place' (Moore, 2012 p 81). Kress also discusses the social dialects (Torbe's 'varieties' and 'repertoires') that become reproduced in schools and classrooms by virtue, of course, of being socially dominant. The sociolinguistic variance and struggle for sociolinguistic dominance becomes visible in the phenomenon Murata (2015) underscores as the ‘clash interface’ of the aforementioned variance and struggle: different scripts may exist and conflict with each other in any one classroom: the teacher’s monologic script and the students’ counterscripts. In such clashing situations, Kress (1982) suggests that a disparity in linguistic etiquette puts in motion a mechanism of enforcing conventionality, which Moore (2012) explains is brought on by a recognition that 'expertise in recognising and replicating certain formal or "standard" linguistic and representational genres needs to be learned by students, but that ignorance of a genre is more likely to be a matter of experience than ability' (p 77).

In conclusion, the role of language in metalearning is central to setting and making available the dialects, repertoires, and scripts learners utilise for making sense of learning. An intermediate level to making sense of learning is making sense of these linguistic forms themselves, which may or may not be congruent with the learner's own for social and cultural reasons extending beyond the classroom. The significance of a learner having or achieving degrees of congruence between their language and one particular to a context lies in their advancing and enriching their sense-making of that context, and endorsing/adapting to/modelling their own sense making around it. Commeasurably, the implication of a context hosting a particular language and of communicating sense to pupils through it through teachers, is its endorsement and propagation of a particular sociocultural repertoire, manifested through the promotion of some metalearning strategies (ways of understanding learning and applying oneself to it) and the silencing of some others.

B.3 Metalearning accounts and autobiographical authorship of the self

Throughout this research runs the central theme of a person's understanding and using contexts, or of individuals navigating structures in order to improve their relationship to them and thus improve their learning. Individual in (or versus) structure has long been the focus of structuralist and post structuralist sociology (predominantly in the works of Bourdieu, Latour, Giddens, Goffman, and others). It has also been viewed with the focus shifted to the psychological self in order to produce scientific descriptions of the articulated self, and to expand around and beyond the ongoing sociological debate on the intentionally/unintentionally socialised self.

Excluding those very few classroom pupils who were reluctant or unwilling to communicate it, unable or lacking awareness, or saw no value in metalearning reflection (Connolly and Ward, 2011; Watkins, 2015), all others relayed constructed accounts of how they have been learning and who they have been as learners in the past, how they experience current learning events, and how they strategically envisage themselves as learners in the future. This notion of learners constructing an (to varying extents) integrative account (or unified narrative, Hall 1992) of their self is highly congruent with that of 'autobiographical authorship' as seen in the works of McAdams (1985, 2013; McAdams and Pals, 2006).

McAdams (2013) posits that the development of the psychological self begins life as a social actor, tightly restricted to the role they are to play in particular contexts, and then, as progression, develops into a motivated agent. McAdams (op cit) suggests that the agent is the developed form of the actor, chronologically emergent in early adulthood (Arnett, 2000). What is evident in the sample classroom, however, is that even younger learners showcase the capacity for integrative story telling of the self, with self-perceptions of actor or agent coexisting in their accounts/stories.

In their still ongoing journey towards the construction of their learning selves, pupils in the sample classroom seem to be constructing and reinforcing their sense-making of their selves either mostly as actors, predominantly adopting given roles and structures, or as agents, led by their 'personal goals, motives, values, and envisioned projects for the future' (McAdams, 2013 p. 1). As such, their everyday experience of classroom learning is not a progression for them.

Navigating structures which endorse either role more consistently, or depending on contextual circumstances, is sociologically understood as a function of the structures, with Goffman (1967) famously asserting that 'the rituals and institutions they [subjects/people] thus create then influence the character of their behavior through the expectations and micro social norms they yield' (in Reynolds and Herman, 1994 p. 408). The degree of agency exerted in a learner's interaction with regulatory structures and structures of sense-making and meaning can therefore be seen as partly determined by the context itself, with Adler, Adler and Fontana (1987) asserting that 'interaction is thus both voluntaristic and structured (but not completely determined) because of this reflexivity' (p 3). In other words, the variation in pupils' voluntary preference or involuntary inclination towards regulating and balancing their actor and agent roles reflects the constraints and affordances that the relevant structures differentially impose on the individual: some strategies are privileged, and some become silenced by the pupils themselves.

The autobiographical understanding that sample pupils have of their agentic relationship with the classroom can therefore be described as related to how they construe themselves: as an actor, preferring to adopt the roles (metalearning strategies) distributed by and through classroom practices in order to navigate them by showcasing compliance, and/or as an agent, preferring to adapt their personal preferences to the relevant framework by regulating (developing and/or applying or silencing) attitudes and understandings in knowledge/anticipation of the response of the context.

This view of metalearners as authors of their self and authors of the context in which that self is constructed, mobilized, and developed, highly resonates with the German biography researcher Alheit's idea of biographicity. Illeris (2007) cites Alheit (1995) to provide a term for the already postmodern prevalent idea that people perceive and interpret their own lives in relation to the opportunities they have and the choices they make:

> Biographicity means that we can redesign again and again, from scratch, the contours of our life within the specific contexts in which we (have to) spend it, and that we experience these contexts as 'shapeable' and designable. In our biographies, we do not possess all conceivable opportunities, but within the framework of the limits we are structurally set we still have considerable scope open to us (p 65).

B.4 Metalearning stories of agency and engagement

A second finding in relation to pupils' preferences in relation to agency and structures is the type of engagement with metalearning each promotes. My tentative interpretation of the findings suggests that some learners are more interested to learn about learning in their classroom in order to gain and solidify esoteric knowledge (special interest towards the most recondite inner workings of a classroom-context), and through that achieve improved participation and learning. Some others pupils, however, appear to be more partial to engaging with learning about learning in their classroom through critical engagement (involving careful judgement and judicious evaluation before taking any position on the classroom-context).

As on issues of agency, this distinction between types of engagement is in no way a dichotomy, but rather an orientation or a preference. Some learners intentionally or intuitively steer or mobilize their metalearning strategies towards deciphering the default parameters in which (their) learning ought to happen- its 'constitutional rules', or should be version, to which they refer in their accounts. On the other hand, other learners are less keen to assimilate the regulatory framework in order to apply themselves to learning, but are better disposed towards transposing their individual preferences onto that framework and using it as it serves them best. This can be gleaned in the richer amount of inferences in their accounts of metalearning, which could be indicating the aforementioned filtering of structures through the self, rather than the opposite.

It is interesting to add as a concluding remark, that in his studies on how learners understand and conceptualise learning, Säljö (1982) constructed two overarching categories: learners

> who see learning as being intimately related to the actual tasks of learning: they describe learning with a focus in gathering facts and information from a text, and possibly on memorizing them for later use. On the other hand, there are people who see learning as finding meaning through the medium of learning tasks: they see things in a new light; they relate them to their earlier experiences; they relate them to the world they live in; they see learning as changing oneself in one way.
>
> (Marton and Booth 1997, p 35)

The link between that study and my own is the originary premise that the cultivation of a particular approach to learning either for the sake of learning itself and/or for self-development is strongly influenced by classroom ideas on learning and the metalearning those promote to learners.

Chapter 8: CONCLUSION

A. Summary

I began this study with a clear idea of its basic theoretical and methodological purpose: a new, coherent theoretical framework for metalearning that was based on precise definitions, a specific empirical setting (a Year 4 classroom in a Primary school with a specific view of learning) and participant sample, a research focus on metalearning, and methods for accessing two aspects of it, diachronic and synchronic. I conducted my empirical enquiry with a clear understanding of the theoretical components - indicators of metalearning I would be likely to find in participants' reflective accounts - but I also strove to detect emergent issues in those same accounts. My position as an insider learner also facilitated maintaining that balance, and although the questions through which I supported pupils in accessing their metalearning were set and specific, the probes and prompts I used throughout all interviews resulted in vastly richer descriptions.

In spite of the rigour in conceptualising my research object and designing a methodology for accessing it, I had a less clear idea about the range of ideas and understandings pupils would discuss in their accounts, how they would discuss those understandings and structure their accounts, and what the extent would be to which they would attribute or link their construction/understanding with those mandates, understandings, and ways of thinking about learning that were prevalent in the classroom. The heuristic character of this research and the reliance on participants' views and experience also made the form of my main argument less clear until the analysis stage.

The overall aim I set out in my Introduction was to represent and showcase through scientific descriptions the sense pupils make of classroom learning, how they use that to improve their current and future learning, and the extent and specific ways through which their process of sense making is influenced by classroom understandings of learning. I believe I have achieved that.

My research was both process and outcome-oriented, as it had a double focus on how pupils make sense of their experience of learning in the classroom, but also on how they use the knowledge gained by metalearning in order to strategise for effective current and future learning. By allowing pupils to express themselves through semi-structured interviews, I achieved understanding of how, why, and when they reflect and make sense of learning, but also of the extent to which they focus on reflection and strategy. With one being a process focusing on past experience and the other focusing on future experiences, the aspect of iterative construction of knowledge and learning is set on a temporal continuum.

Additionally to the double research focus on process and outcome, my research also included another division, one between pupil and classroom metalearning processes and outcomes. My focus on participant views was conducive to understanding what sense they considered that the classroom intended them to make of their experience, as well as the recommended/privileged mechanisms for constructing that understanding. This reconstruction of the classroom through the eyes and minds of pupils provides a valuable insight into classroom and pedagogic architecture and pupils' perception, interpretation, and utilization of this. This interactionist perspective presents metalearning as a personal endeavour of processing the reality of a social community and shared enterprise, with an intention of relating and responding to it, and strategising for improving one's interaction and relation with it.

As a research and social enterprise, this research has achieved providing information on a scientific construct as well as on the worth of accessing the construct from the views of learners. It illuminated the advantage of accessing a construct through informed experience, which highlights the sufficiency or needs for extension of theory describing the construct. This research provides information on pupils' diachronic and synchronic metalearning, the aspects of classroom learning their awareness is focused on, at each level of metalearning reflection, as well as a range of metalearning strategies that exist in the classroom, and their development in relation to classroom notions of metalearning strategy.

In each of the two analysis chapters I posed the same three research questions, but differentiated the range of their descriptive or explanatory potential. Although the analysis conducted on each of the two datasets was distinct, there was a clear analytic aim of understanding how accumulated metalearning and metalearning knowledge could be implemented in current learning, or inform strategising for future possible learning. In simpler words, there is analytic continuity in understanding how pupils' past metalearning informs

current learning in the classroom, how and to what effect current learning experiences feed back into past metalearning, and how the now informed/changed metalearning strategy is envisioned to be applied in future classroom learning.

The three overarching questions guiding this research are:

- What accounts do pupils construct of their metalearning as it happens in the context of their classroom?
- Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do?
- Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning?

The first question is descriptive, and addresses the structure of pupils' reflective accounts on diachronic and synchronic metalearning: in both datasets, pupils discuss metalearning as a process of interaction between personal sense and the social milieu of the classroom. The second question has an explanatory aim, and has required providing an explanation for the range of metalearning views and strategies in the case of the classroom: the existence of a range of personal metalearning strategies was confirmed, and pupils indicated that their construction and direction of metalearning strategies was significantly influenced by classroom views and structuring of learning and metalearning. The third and last question is descriptive, and aims at listing those elements of the classroom which pupils find most informative and influential in their shaping metalearning.

I address all three questions in a subsequent section, after discussing the limitations of this research.

B. Limitations

Pragmatically, all scientific aims are tempered by limitations, and this project is no exception. Although the basic analytic unit of this entire endeavour is learner experience, so far it has been impossible to design a methodology for unhindered access to a person's sense-making, awareness, or complete understanding of themselves in their world. The decidedly fragmented

viewpoints this research can collect are further curtailed by the inverted power relationship between participant and researcher: participants have the power to intentionally deny access to their experience by refusing participation, providing untruthful accounts, or providing answers they feel might please the interviewer. Although my pupil sample was decidedly forthcoming and enthusiastically keen to describe their experience, I can never preclude the possibility that some of them denied me access to some aspect of their metalearning.

Some consideration also needs to be given to the relationship between access to experience and linguistic dexterity. Interrelating aspects of experience and sense-making in a reflective account can prove problematic for researchers who seek rich accounts. In my research this was a moderate limitation, with pupils expressing themselves simply, yet clearly, even in cases of pupils speaking English as a second language. Being a non-native English speaker myself, I was familiar with paraphrasing and providing them with some synonyms from which to choose when necessary, but that does not preclude some degree of limitation in our communication.

Moreover, it is important to once again to stress the deliberately set limitations of the single case research design. I chose to research classroom metalearning in a single Year 4 classroom that was not particularly strained by demands on performance (no high-stakes examinations) and was part of a school-learning community with a particular and specific ethos in regards to learning. This choice limits exploration and explanation of school-wide pupil metalearning, teacher metalearning, or the ways in which metalearning is/could be inbuilt in instructional designs. A single case design also deliberately limits the generalisability of results, and privileges their representational value instead.

C. Pupils' metalearning in classrooms

This project has indicated that pupils do make sense of their learning in the classroom without explicit and direct instruction on doing so. Each pupil appeared to have a unique degree of awareness and control over their sense-making, as well as on the use they made of the sense produced in order to improve their learning. Each of these unique perceptions and constructions indicated the existence of an overall metalearning strategy, which constitutes a unique way of being aware, in control, and in executive command over one's own learning. Although the uniqueness of each pupil's metalearning strategy was clear, all accounts had a common basis of reference in the structure and processes of classroom learning.

Making sense of classroom learning was also seen as linked to making sense through classroom learning: pupils discussed constructing their understandings of classroom learning by using sense-making patterns and mechanisms made available to them in the classroom. In simpler words, pupils, additionally to learning in classrooms, also learned about how learning should be done. Regularly used and emphasised patterns for using specific learning strategies, affective attitudes, motivational dispositions and ways of interacting with one's context of learning provide pupils with a specific model with which to navigate and understand learning.

Additionally to making sense of classroom learning, pupils also make sense of their own learning in relation to the classroom model. They make sense of their strengths and weaknesses, but also of the ways in which it is possible for them to improve their effectiveness. This process of making sense of personal learning is intertemporal, as pupils discussed making sense of past and present learning experiences, and using the sense they have produced to design ways in which to strategically apply themselves to learning in the future. Classroom cultivated/mediated awareness of what classroom learning is, and how a learner can apply themselves to it successfully, is also linked to pupils' sense of themselves as learners. Having an understanding of how learning 'works' in the classroom seems to allow pupils to compare themselves with that understanding and to construct a learner identity.

Lastly, the descriptive and exploratory foci of this project did not coalesce in clear typologies of metalearning strategies and identities in the classroom, but rather highlighted a specific range within which those appeared to be distributed. As stated previously, unique strategies and understandings of the learning self all reflected classroom approved understandings of learning and metalearning. It might appear unsurprising that there was no pupil who discussed a metalearning strategy that did not include an understanding of classroom ideas and views about learning and understanding learning. However, the significance of this finding lies in the power of the classroom to influence and control pupils' metalearning, by privileging particular views and strategies and silencing others.

As such, metalearning can be seen as shaped by contextual-situative affordances and constraints. Pupils act on these opportunities and limitations with various degrees of agency. While some pupils direct their sense-making more towards gaining knowledge about the inner workings of the classroom, others prefer to critically engage with classroom learning and test the boundaries of the ways in which the classroom allows them to apply themselves to learning.

Pupil preference towards 'should be' or 'could be' attitudes to metalearning highlights the previously loosely or indirectly linked aspect of agency to metalearning in classrooms.

Additionally to presenting my overall findings on metalearning, I will also present the findings corresponding to the object of each research question: the structure of metalearning accounts (-What accounts do pupils construct of their metalearning as it happens in the context of their classroom?), the possible reasons behind pupils discussing metalearning as they do (-Why do pupils construct theories, explanations, and experiences of metalearning in the classroom as they do?), and lastly, their views on the influence of specific aspects of the classroom on their metalearning (-Which elements of the physical and social environment of the classroom are most influential to pupils' understanding and developing metalearning?). I will provide a succinct overview of the main findings presented in Chapters 5 and 6. A summary of the findings has also been provided in Chapter 7, in which overall findings are discussed.

C.1 How pupils structured their accounts of metalearning

Each pupil produced two accounts, in accordance with the methodology of this research: one reflective account on diachronic metalearning, and one reflective account on synchronic metalearning. In their accounts on diachronic metalearning, pupils were invited to reflect on the themes of learning, good learning, thinking to learn, feelings about learning, self-direction, and useful social and physical aspects of the classroom. Pupils constructed accounts of synchronic metalearning by reflecting on audio-visually recorded learning tasks. The structure of accounts was therefore moderately controlled in terms of themes, but not in structure.

Pupils structured both types of account through direct references to events, materials, and practices in the classroom, and through personal inferences on those events. They discussed sense-making of situations as a process that includes awareness (both diffuse and targeted) of learning in the classroom, and personal interpretation. Pupils discussed certain personally significant classroom and psychological events (like a novel approach to learning or the realisation of personal limitations) as stimulation for sense-making.

Lastly, the structure of metalearning accounts is one of order in augmented situative specificity: Pupils discussed what they understand the classroom intends their learning to be like, then what they themselves understand their learning to be like in the classroom, how they

understand their learning to be in different subjects and lessons in the same classroom, and lastly how they understand learning to happen in specific tasks/experiences.

C.2 How pupils described metalearning in their accounts

Each pupil's metalearning can be discerned in their choice of describing different aspects of their experience of learning in the classroom. Metalearning strategies unique to each pupil did indeed emerge in the rationale and the connections each pupil made when linking all components of metalearning important to them. Metalearning seems to be a pattern for sense-making as well as the result of sense making, and to include unique perspectives on knowing about learning (cognition), feeling about learning (affect), rationales and goals for learning (motivations), and the classroom as a space for learning constituted by affordances and constraints (context).

Beyond existent theorisations, sample pupils also suggested metalearning to be a process of understanding and constructing the self as a learner. Pupils linked being/becoming aware and in control of one's learning with being/becoming aware and in control of oneself as a learner. Reflection on past learning/metalearning, utilisation of metalearning knowledge produced in current learning, and strategic planning for improvement in the way one applies themselves to learning in the future, added an intertemporal dimension to metalearning. Pupils appear to have an autobiographical understanding of themselves as learners, achieved through intertemporally threaded sense-making of learning in context.

Pupils also discussed metalearning as a way of improving their participation in the social milieu of the classroom: achieving better understanding of the constituent rules of the classroom and of themselves as learners with the potential to grow and improve in the context of the classroom appears to underpin their making sense of the classroom. Moreover, they reflect in order to inform their diachronic metalearning with synchronic metalearning with a purpose of applying themselves to learning in the future in an improved way.

The two most crucial processes, thinly described in literature, metalearning reflection, and metalearning strategy, emerged in both the structure and content of pupils' accounts. This research suggests a description for metalearning reflection, which includes the following characteristics: a. the learner perceives learning to have taken place, b. the learner has the

facility to assess the achieved learning against personal or personally endorsed external criteria, and c. the learner can identify ways in which the learning achieved bridges past and future learning. As far as metalearning strategy is concerned, this research highlighted how sense-making occurred in the past- diachronic, the present-synchronic and the future-strategising, but it also highlighted its close affinity to pupil-perceived classroom structure. My nominal conceptualisation of metalearning strategy is that of chess: although the same rules and regulations apply to all learners, each plots their own course across it, by setting different goals for themselves, different attitudes towards learning/action, and by using a different arsenal of methods (for an extended discussion, vis Chapter 7).

C.3 Why pupils discussed metalearning as they did

With the explanatory grasp of this research strictly limited to pupils' sense making of learning in the classroom, focus was directed to the interplay between personal metalearning and classroom conceptions of metalearning. In their accounts, pupils described the classroom as a framework of reference, with constituent rules and rites which they have to navigate in order to learn and metalearn.

The classroom therefore appears to be perceived as a signposted field replete with choices. Pupils appear to construct and deploy metalearning strategies they deem effective in order to face those choices. All the while, the classroom exerts a degree of control over those choices not only by presenting pupils with them, but by making available mechanisms and patterns of decision-making (e.g. specific learning strategies, or classroom attitudes), but also of making sense of choices.

The predominant mechanism used for communicating patterns, processes, and choices privileged by the classroom is language. I firmly believe that the relationship between metalearning and classroom learning is one of the most important findings of this research. Resonating with Vygotskian notions of learning as enculturation, pupils' accounts reflect how specific linguistic codes for discussing, describing, and communicating learning in particular ways influence and guide pupils' own sense-making mechanisms.

Finally, a relationship emerges between sense-making, and meaning-making. Also in congruence with Vygotskian views, pupils discuss sense as constructed in specific contexts and as temporally

and locally bound, but also discuss their construct/idea of learning as an aggregate of understandings produced in different contexts. This elevates the role of metalearning into a mechanism that is decidedly influential for people's core conceptions of learning and learner identities throughout their lives.

C.4 Aspects of the classroom discussed as influential to pupils' metalearning

Pupils discussed making sense of the classroom by having and building awareness of specific material and cultural features of the classroom. They predominantly discussed being aware of classroom views of learning through routines in provision and rites in culture, meaning patterns and structures of teaching and learning through which classroom learning is actualised, but also of cultural particularities that supported actualisation. In this particular classroom, teaching and learning procedures were supported by learning attributes which were principles deemed conducive to learning (like perseverance and collaboration).

On a more direct level, pupils also discussed direct interactions with the teacher and peers with the purpose of getting feedback as influential to their sense-making. Also direct was the use pupils made of material resources found in the classroom, such as wall displays and instructional materials. As direct as their use of material was, pupils still discussed using them for specific purposes in specific instances, and in a manner congruent with the processes and rites of the classroom.

D. Contributions to theory and suggestions for further research

This project has achieved nine breakthroughs in conceptualising and researching metalearning:

1. It has improved the specificity of pre-existing theoretical descriptions through consideration and choice of coherent and epistemologically consistent definitions (experience of learning, awareness, strategy).
2. It has proposed and empirically tested a theoretically based methodological platform for researching metalearning. Access to learners' metalearning has been designed and

achieved through qualitative accounts of synchronic and diachronic reflection on learning in the classroom.

3. It has asserted a clear distinction between metalearning and metacognition, and confirmation that metalearning is a process superordinate to metacognition.
4. It has suggested a definition for metalearning reflection as distinct from metacognitive reflection.
5. It has achieved providing evidence on learners' sense-making of learning to be a function of classroom-constructed, approved and promoted sense of learning. Although sense is made in the context of a classroom, it also informs other experiences (perhaps in other classrooms, but also beyond schooling), as well as the overall meaning one gives to learning.
6. It has viewed metalearning strategy as a learner's unique way of making sense of the classroom in order to navigate it effectively. It combines metalearning knowledge from past, present and future learning.
7. It has highlighted the importance of language and communication in sense and meaning making of learning.
8. It has suggested the construct of autobiographicity as conducive to supporting and being supported by sense-making. Learners strategise for improving the way in which they learn about learning and apply themselves to it.
9. It has proposed that a relationship exists between agency and engagement, and indicates towards the emergence of two major orientations or preferences: an agentic stance leading to engagement with making sense of classroom learning in order to gain esoteric knowledge, and an agentic stance leading to engagement with sense making in order to promote critical engagement.

All these premises, which I extensively discussed in the previous chapters, constitute an innovative, original approach to metalearning, and, although the aim of this research was to improve understanding of the construct and to extend theory, some attention must be given to the implications of this improved understanding.

The importance of this study for learners and teachers lies in making transparent how learning about learning happens in a classroom, even in those cases when it is not designed for. The classroom is shown as a milieu with a powerful influence on its participants' understandings and construction of mechanisms for understanding. Specific implications for teachers include a call for attention to and reflection on the language used for describing and talking about learning in

the classroom, and what sense of learning it could promote to pupils. Some attention and reflection need also to be directed towards the degree to which metalearning is directly taught or communicated to learners. This can include a process of reviewing overt preferences to ways of knowing about learning, feeling about learning, reasons for wanting to engage with learning, and using the social and physical environment of the classroom to learn: the balance of each in one's classroom constitutes its metalearning profile, awareness and explicit discussion of which can help practitioners design targeted interventions for improving one or more aspects of classroom metalearning. Lastly, since metalearning has been located in the interaction between teacher (classroom)-peers- learner in the milieu of a classroom, I will restate Watkins' (2001) recommendation to make learning an object of attention and conversation. By establishing channels of open and sincere communication about what learning is, what it means, and how it can be understood, teachers can improve their provision of metalearning, and learners can inform teachers on their processes of making sense of learning, reflecting on it, understanding themselves as learners, and, lastly, on their repertoire for applying themselves to learning at present and in the future.

Additionally to implications relevant to the empirical domain, this project also involves an emphasis on implications for metalearning theory, and recommendations for further research and advances. This investigation of metalearning in a classroom has confirmed and recommends a departure from cognitivist categorical approaches to researching metalearning, and a move towards dimensional/dynamic approaches to theoretical description of metalearning. Although this shift cannot include complete abandonment of all categorisation and distinction between components, processes and functions of metalearning, it signifies a more situated-appropriate approach. Metalearning strategy viewed as a range, or repertoire, and not as a quantitative 'recipe' or plan, can help advance descriptions by sidestepping theoretical polarities that would limit our understanding of situated metalearning at this very early stage in its research development. Perhaps, after a sufficient number of empirical projects, some typologies could emerge through a systematic review; yet even then, I defend the view that these typologies should rather be viewed as belonging in a range bound to the situational characteristics in which they emerged.

With this project being the first empirical investigation of metalearning in classrooms, future directions and possibilities appear to be inexhaustible, both in terms of setting and type of methodological design. A useful direction forward would be to research two same Year classrooms in a school with a particular ethos of learning in a comparative design, in order to

further clarify the degree to which each classroom has a unique internal ethos and metalearning strategy repertoire, and the degree to which school ethos imposes congruence in those aspects.

A different research direction could involve a longitudinal design for tracing the development of metalearning processes and strategies of a set sample of learners through their experience of different classrooms, and even different school ethea. Such a holistic insight into how people come to make sense and meaning of learning could be invaluable for understanding and supporting metalearning in/through schools and classrooms, but also as a basis for lifelong attitudes and understandings of learning.

Another suggestion for future research is one I find particularly intriguing, and which includes researching metalearning in schools and classrooms with no set ethos and no common understanding-language of learning, in which each classroom is an island milieu for metalearning. Does the lack of a uniform ethos across school Years impact pupils metalearning, and if so, in what way, and to what extent? With fragmentation in communication being an increasingly pressing concern in formal education world-wide, research on metalearning can provide a platform for discussing learner-centric views on quality of pedagogic provision.

With metalearning gaining interest and being included in seminal, trend-setting and widely appealing publications on current and future directions of learning (e.g. Tight, 2014; Scott and Hargreaves, 2015; Fletcher, 2015; Scott, 2016), I have high hopes that this thesis will further aid a rekindling of the conversation on the theory and praxis of metalearning, and provide a valuable lens for relooking at learning in classrooms.

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