

“I used to spoon feed them”

The effectiveness of self-regulated learning interventions for secondary aged students: an exploration of teachers’ perspectives.

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Abstract

Self-regulated Learning (SRL) has been described as 'a key construct in education'. Self-regulated learning (SRL) strategies include cognitive, metacognitive and motivational processes that combine to define an effective learner. The Education Endowment Foundation (EFF) recommends SRL and suggests that academic outcomes using this strategy can confer advantages worth up to 7 months academic progress.

The thesis examines the effects of interventions aligned with SRL for secondary aged students. The systematic literature review explores studies for young people with learning disabilities from an adolescent school population. This review identified eleven studies that were appraised using Gough's (2007) Weight of Evidence framework. The findings show that there were mainly large effect sizes with some medium effect sizes. Previously, researcher led interventions have been shown to be more effective than teacher led, however this review identified positive outcomes across researcher delivered, teacher delivered and peer-led interventions. This suggests that effectiveness can be achieved across a range of parameters and supports the implementation of teacher delivered interventions and development of SRL school staff training.

The empirical study adopted a multiple case study design using three secondary schools, two mixed comprehensives and one alternate provision. Teachers attended two workshops on SRL and were asked to apply concepts and trial strategies appropriate to their subject specialism over up to 8 weeks. Pre and post questionnaires found small but non-significant increases on the Teacher Attitudes towards Self-regulated Learning and Teacher Sense of Self-efficacy Scales. A reflexive thematic analysis (RTA) identified three overarching themes

from teachers including; SRL met a range of perceived student needs relevant to the key stage 4 students; Teachers identified with the principles of SRL and finally SRL was perceived to address systemic issues that impact student achievement. Implications for EP practice and education are discussed.

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Chapter 1: Introduction to the thesis.

1.1 Rationale for Topic Selection

Despite the existence of a broad literature base supporting the link between effective learners and metacognitive abilities (Muijs & Bokhove, 2020) spanning several decades, metacognition, and self-regulated learning (SRL) principles more generally, are still being reviewed by the Education Endowment Foundation (EEF) with evidence presented to the teaching profession (Quigley et al., 2019) rather than being embedded practice in teaching.

Self-regulated learning developed from correlational evidence identifying the types of studying behaviours observed in high achieving students and those assigned to higher level classes (Zimmerman, 1986). Zimmerman, highlighted a three part definition of SRL, shown below (Table 1.1) that describes the types of behaviours seen by self-regulated learners. It is challenging to imagine how much control that students have, prior to post-16 education, over their learning environment, levels of noise and organisation of materials that is suggested by the 'behavioural' element of SRL in this definition. However, a key premise is that the underpinning behaviours being highlighted by a focus on SRL are beneficial both in the immediate task and as part of developing lifelong learners, equipped to learn and develop skills beyond school. Developing learners by focusing on 'processes' contrasts with other approaches that direct learning opportunities based on ability levels of learners (Zimmerman, 1986). The philosophy of a process-based approach is therefore congruent with the remit of educational psychologists of promoting the learning opportunities for all learners (Birch et al., 2015). Developing SRL skills has the intention to be a universally helpful

intervention and can be delivered by teachers across a range of subjects and contexts.

Table 1. 1 *The Three Elements of Self-regulated Learning Depicted by Zimmerman (1986)*

Tripartite process of self-regulated learning.	Processes carried out by self-regulated learners, for example:
1. Metacognitive	Plan, organise, self-instruct, self-monitor and self-evaluate.
2. Motivationally	Competence, self-efficacious and autonomous.
3. Behaviourally	Select, structure and create optimal environments for learning.

Self-regulated learning is described by Zimmerman (1986) as a ‘process’ approach to learning that is distinct from a focus on teaching based on student’s ability levels. SLR recognises that learning behaviours are influenced by a number of factors that include both the individual, their experiences and how they interpret their learning experiences. SRL has developed through a cross-pollination of theoretical ideas from developmental psychology and the study of social cognition (Dinsmore et al., 2008) and as such holds the promise of addressing a range of factors that may impact learners within a classroom

context. As SRL has evolved it has taken on a range of definitions, therefore, for consistency, throughout this thesis the three part definition of self-regulated learning being composed of cognition, metacognition and motivation is used as proposed by the EEF (Quigley et al., 2019). The definition used throughout this thesis is consistent with information readily available to schools and aligned with recommendations for teachers shown in Figure 1.1 below (EEF, 2021; Muijs & Bokhove, 2020).

Adolescence is a significant period for brain development, with implications for student's executive functioning skills through frontal lobe reorganisation (Dumontheil, 2016). Additionally, strategies that promote autonomy, such as self-regulated learning strategies, are likely to be well received by secondary aged students (Yeager et al., 2018) whilst also being appropriate to address the increased demands of the secondary curriculum (Dent & Koenka, 2016).

The following systematic literature review and empirical papers are both focused on the use of self-regulated learning in secondary school (11-16 year old) populations.

Figure 1. 1 Education Endowment Foundation, extract from Summary of recommendations poster



METACOGNITION AND SELF-REGULATED LEARNING

Summary of recommendations



1.2 Thesis orientation.

This thesis aims to explore firstly how effective SRL strategies are for learners who find academic subjects challenging due to recognised learning disabilities within the review paper (chapter two) to establish if SRL is an inclusive educational tool. The empirical paper (chapter three) then considers teachers' perspectives of SRL gathered through interactive workshops using self-regulated learning principles to unpick challenging areas of content delivery for a range of subject specialisms in the secondary UK education context. Finally, chapter four provides a critical reflection of the outcomes and outlines plans to disseminate the findings of the thesis.

The literature review examines to what extent the evidence for self-regulated learning strategies applies to those students who have learning difficulties. The review paper includes randomised control trials and single case experimental designs to assess the outcomes post-intervention of strategies that contain key concepts aligned with the construct of self-regulated learning that includes cognition, metacognition and motivation, examining each of these constructs in turn. As the review paper established the basis for accepting SRL strategies as an inclusive approach to improving academic achievement the next stage was to check teacher perceptions of the introduction of SRL into various curriculum areas. The three concepts of SRL (cognition, metacognition and motivation) were then developed into a teaching staff training package and delivered to secondary teachers to form the basis of the empirical paper (chapter three).

The empirical paper seeks to explore the perspectives of teachers regarding the use of self-regulated learning in their secondary classrooms. A need to capture the perspectives of teachers was identified as an important element in understanding how easy it is for teachers to incorporate the cognitive science of SRL into their vocabulary and teaching repertoire. Chapter three considers why we are still in a 'selling the idea' stage of implementation to an approach that seems to be backed by a considerable body of knowledge. As an ex-teacher the researcher recognised the strategies linked to metacognitive teaching, such as creating planning sheets and self-assessment activities for longer answer exam preparation within their own teaching pedagogy, without necessarily using the language of cognitive science to describe strategies or sharing this language with students. A consideration for future researchers is whether language used by cognitive scientists (retrieval practice, inter-leaving, spaced practice etc) has alienated some teacher practitioners who are in fact onboard with the underlying principles of SRL strategies. Alternatively, questioning what the negative impacts of SRL intervention might be for some students or why might some teachers find it hard to implement may help to move away from the perpetual cycle of educational ideas that are 'recycled' over time with new names (Zhao, 2017).

Teacher's ability to split their focus between the implications of research findings and day to day teaching demands is likely to be a challenge (MacMahon et al., 2022). Educational psychologists can play a role in 'translating' the theory into practice as they have skills and knowledge that traverse both the educational and research worlds and are in a position to offer training to schools.

The intention of the empirical paper was to seek an understanding of how self-regulated learning is conceptualised by teachers, was it recognised as part of their existing practice and how did they respond to workshops that aimed to promote the use of the strategies explicitly with their students across a range of subject specialisms? Two ninety minute workshops were developed applying SRL strategies and theoretical underpinnings to classroom practice with secondary subject specialists and inviting them to discuss how the approaches could be adapted and used within their own subject areas (Appendix A). Teachers were encouraged to think about barriers to learning and difficulties facing students and asked to consider if these approaches could address the issues raised. The workshops were positioned to allow time for teaching staff to trial ideas within their current curriculum delivery over several weeks and return to workshop two with feedback and further questions where relevant.

Examples of self-regulated learning principles being promoted to teachers in secondary contexts throughout the research journey confirmed that SRL is a current and pertinent aspiration for teaching practice rather than embedded in practice (Callan, 2020). For example, whilst recruiting participants an initial teacher training provider (who was not able to participate due to their training curriculum already being in place for the academic year) responded to say that metacognition was part of their teacher training curriculum. One of the participating schools, introduced cognitive science as the whole school CPD focus for the following academic year the term following the workshop delivery. Self-regulated learning is a current topic in classroom pedagogy with suggested academic benefits and therefore an area worthy of further investigation. Investigating the wider effectiveness of SRL strategies (Chapter two) and

developing an acceptable programme of implementation for SRL into secondary classrooms (Chapter three) has the potential to increase accessibility of developing educational competence, and therefore lifelong learning skills, for a broad group of learners. It is key that educational psychologists understand the benefit to students of promoting SRL strategies, as developing competence and self-esteem can impact students throughout their life post-school and affect the opportunities they seek out in the world of work.

Chapter four outlines a plan to disseminate research findings from this thesis with beneficiaries from academic, social and economic perspectives considered. Four publications are identified as suitable places to share and connect with interested professionals and a rationale for their selection has been given.

1.3 Epistemological considerations and theoretical perspective.

Researchers' philosophical perspectives are understood to shape methodological decisions made when designing studies (Moon & Blackman, 2014). Ontology is one's view on the nature of reality with this researcher taking a critical realist approach that a broad examination of a process is needed to begin to understand any phenomenon and that each individual creates a view of reality (constructionist). Epistemology represents views on how knowledge is created for example, social constructionism (that knowledge is created) is the perspective taken in chapter three. An alternative position is positivism and through a positivist perspective (the concept that objective methods collect accurate information) randomised control trials (RCT) are the preferred method of finding out what works in education. However, an interesting argument from Zhao

(2017) is that a 'what works' approach ignores the inevitable side effects that exist in any intervention and lead to assumptions that examples of what is 'not working' are through poor implementation. In education the side effects (suggested as not being considered through positivist approaches by Zhao, 2017) may relate to the human-environment factors (Moon & Blackman, 2014) which translate to the teacher-classroom-student interactions when applying to education contexts. As a result, this researcher takes a position that carrying out research in schools is more useful when contextual factors and views of key stakeholders are part of the research process.

Thoughts and beliefs about how knowledge is constructed (epistemology) can differ across researchers. Teachers beliefs regarding the workshops will differ and a range of ways of exploring teacher perspectives on SRL was used to reflect the relativist perspective that each individual creates their own version of reality (Moon & Blackman, 2017). The review paper examines research which may fit more appropriately into a critical realist assumption (that one reality exists that is hard to pin down) that 'measuring' the impact of the intervention will lead to replicability of results being possible, Barker et al. (2016). In this respect this researcher has been on a journey shifting away from considering what happens to teachers and their students learning after a self-regulated learning workshop using a positivist perspective of pre and post intervention difference (looking in at an assumed process as an observer) in the review paper. The empirical paper adopts a more exploratory approach using interaction in workshops that promoted teachers sharing perspectives and thoughts around established concepts in education at a point in time. Ontology, epistemology and methodology in relation to chapters two and three is described in the table below.

Table 1. 2 *Table 1.2 Summary of Ontological, Epistemological and Methodological Perspectives across Chapter Two and Three*

Theoretical position	Application to review paper (chapter two)	Application to research paper (chapter three)
Ontology: what is reality?	Critical realism accepting that there is a phenomenon to be studied, that a reality does exist but it may shift and change. When teachers deliver an intervention there is an ability level of the learner at the start and the end of the process and by measuring differences in this we can 'see' the phenomenon of the change caused by the intervention.	Social constructionism: We all create separate realities; culture and language allow us to share some understandings. Within each classroom a unique set of circumstances develop based on teacher-student relationships, time of the day the lesson occurs, subject and it's implication for the student and also for the teacher and their career choice, change depending on year group.
Epistemology: How do we know/find out?	Reviewing papers that have used scientific methods with clear instructions, control variables where appropriate helps to clarify that the changes are brought about by the intervention.	By asking people to discuss and think about the situation or event meaning and understanding can be interpreted. Each teacher brings their own perspective that adds to the built understanding of how to make sense of SRL in relation to secondary teaching.
Methodology:	Randomised control trials and single case experimental designs are included to identify what change has occurred in peoples learning. Formalised description (systematic literature review) of process used to compare results across papers allows others to replicate process and findings.	Case study: Valuing depth and individual differences and aiming for richness of data. Flexibility to gather information in a range of different ways from each participating school to compare how SRL has been used and what is thought of SRL across different contexts. Individual differences in this research refer to individual schools.

Chapter three takes an epistemological position outside of positivist accounts of self-regulated learning and seeks to explore the views (using a social constructionist perspective that there is no single reality) of teachers during workshops delivering the underpinning points of self-regulated learning. This approach explored the potential problems with implementation into the classroom beyond 'does this work?' to find out 'when can this be useful?'. By delivering the workshops and leading the focus groups the researcher acknowledged that they were not detached observers from the research process and recognised this process as social constructionism (Barker et al., 2016). A Semi-structured interview and two focus groups were used to explore teacher perspectives across three secondary education contexts in the south east of the UK. Each setting consisted of differed cohorts with varying levels of pupil premium funding across the schools, one of which is an alternative provision.

An exploratory multiple case study design aligned with the purpose of the research and was appropriate to the challenges of conducting research in schools post-Covid-19. Inspired by Yazan's (2015) pragmatic reflection that even constructionist positions could include quantitative data for triangulation (Yin, 2014) and through weighing up a range of perspectives on case studies, a flexible approach was adopted that took advantage of an evolving design. This allowed the researcher to embrace the research journey and address questions that became relevant; take opportunities as they came up, rather than plan every detail at the start with a rigid design across all three schools (Yazan, 2015).

The contribution of this thesis is to identify whether self-regulated learning principles are effective at improving outcomes for a wide range of learners which

can give confidence to educational psychologists (EPs) to promote the strategies to those learners that are most likely to be the focus of their work supporting teachers; those with learning disabilities. During the workshops teachers were encouraged to identify areas of content delivery that are challenging for students within their subject specialisms and to apply the SRL strategies to those areas of the course. The subsequent focus group contributions of those teachers help to clarify what it was about those strategies that teachers felt worked well and reflect on the remaining issues of difference in levels of motivation that students bring to their learning. By developing a clear understanding of the perceived usefulness and barriers faced by teachers this research helps to orientate EPs to support teachers. It aims to help address the difficulties of applying terminology into practice when EPs recommend 'metacognition' and focus support on developing self-regulated learners and provide clear and teacher approved methods of applying theory to practice. The findings from chapter three contribute to EPs knowledge and understanding of how SRL strategies can help in the classroom, as teachers highlighted both the increased levels of competence of their learners and positive change in previously disengaged learners. As all learning environments and individual classrooms are unique, it provides an insight rather than a definitive solution into the challenges faced by teachers and SRL appears to offer much support and guidance to these nuanced scenarios.

1.4 Methodological stance

Chapter two makes use of the value that can be derived from objectivist research which is that it can offer external validity and reliability (Moon & Blackman, 2017). This is helpful in an educational context to provide support for initiatives being

successfully implemented in more than one context. Having established a research base for the effectiveness of interventions with a range of students both through researcher and teacher delivered SRL focused programmes (chapter two), the focus turned to teacher perspectives on incorporating SRL. It was acknowledged that with teacher perspectives, there was no single reality and that views collected are socially constructed; this underpinned the decision to use a case study approach that included focus groups to provide a forum within which perspectives could change and be adapted through the discussion (Barker et al., 2016). The value of constructionist perspectives in research is that contextual understandings can be explored (Moon & Blackman, 2017). A case study approach to data collection was considered a suitable and flexible method of collating teachers' experiences of participating in the SRL workshops across three different schools. Using a case study design and taking a social constructionist stance to the data collection, facilitated the exploration of depth and acknowledged opinions as valid data. Likewise, the design allowed the researcher to acknowledge subjective influences that the researcher brings into analysis and acknowledges Bronfenbrenner's' Bioecological model (Bronfenbrenner & Ceci, 1994) and theoretical stance that a range of environmental and system level influences impact our perspectives and positioning. This was important in the context of teacher participants, as the positions held by teachers regarding pedagogy and classroom practice would impact everyday interactions in the classroom with students. The aim was to explore teachers' constructions of what it is like to make use of SRL principles in their everyday work in the classroom. Identifying and understanding barriers to teacher use of effective SRL strategies in the classroom is an important addition

to the knowledge base for how best to support students in the secondary school context.

Design decisions permitted the collection of a range of information sources (questionnaires, fidelity checklist and focus group contributions) with a view to one data source informing and adding new information to the other. The empirical study sought to use a range of data including directly examining teacher perspectives. The focus group element was intended to provide the teacher participants with time to co-construct their perspective on the self-regulated learning theories and workshop experiences, which would not have been possible during individual interviews for example. Barker et al. (2016) suggest the benefit of focus groups as providing the researcher with closer contact with the phenomenon being researched. As the researcher is up close to the opinions and responses of the participants it is also an inherent limitation that those who do not want to share their thoughts on the workshops were not included in the data collection, as they were able to opt out. An additional intended benefit was to maximise exposure of staff to problem-solving discussion applying SRL strategies; to enable the focus group to become both the data collection process for this researcher and a continued part of the Continued Professional Development (CPD) for the time-stretched teaching staff. A hopeful intention was that each setting would have an ongoing support network to continue CPD discussions once participation in this project had ended.

Mixed methods multiple case study design allowed the researcher to meet the dual demands of educational relevance; asking if the process has an impact on perspectives and actions (questionnaires) and the need to address the ecological

validity question: 'is this possible to deliver in a busy school?' (focus group discussions and fidelity checklists). Research decisions were made on the philosophy that school-based interventions were best evaluated when delivered in-situ, and most effective when delivered by school staff as part of the normal curriculum (Muijs & Bokhove, 2020). A research base exists, underpinned by the pilot and evaluative research evidence suggested as necessary (Krueger & Casey, 2014) to provide confidence that the process of making use of SRL is beneficial to learners. Further questions, regarding if SRL strategies are promoted by teachers and what teachers think about SRL, remain. This research aims to evaluate the acceptability and usefulness, from the perspective of busy secondary school teachers, of implementing workshop content on SRL across three settings as a new research area in secondary schools. To ensure that the qualitative elements of the research were robustly designed a checklist for quality of research was used (COREQ-32, Tong et al., 2007) and is included (Appendix B).

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Chapter 2: Review paper.

How effective are self-regulated learning techniques at improving academic outcomes for 11-16-year-old pupils with learning disabilities?

2.1 Abstract.

This systematic literature review looks at the academic outcomes of interventions in school settings that use self-regulated learning (SRL) strategies that include metacognitive (MC) processes. This review focuses on secondary aged-pupils with learning disabilities both within mainstream and specialist settings. SRL has been described as 'a key construct in education' (Boekaerts & Cascallar, 2006). The education endowment foundation (EFF, Muijs & Bokhove, 2020) recommends SRL interventions and suggests that academic outcomes using this strategy can confer advantages worth up to 7 months of progress. However, the EFF (n.d) review supporting its use with learners with additional needs, draws on references from meta analyses that consider learning disability intervention effective as a whole and not specifically SRL and does not focus on secondary age populations. This review focuses specifically on interventions aligned with SRL, that report findings for populations that have learning disabilities and are from an adolescent school population.

This review identified eleven studies that were appraised using Gough's (2007) Weight of Evidence framework. The findings show that across eleven studies there were mainly large effect sizes with some medium effect sizes. The paper concludes with strengths and limitations regarding how these strategies can be employed in schools and applied by educational psychologists to enhance student outcomes. A strength was that positive outcomes were seen across researcher delivered, teacher delivered and peer-led interventions suggesting that effectiveness can be achieved across a

range of factors, in particular it is ripe for developing into a school staff training programme.

Future researchers should ensure that student population characteristics are clearly identified when research is conducted out in schools to determine the effectiveness of interventions on academic outcomes for a range of learners.

2.2 Introduction

2.2.1 What is self-regulated learning?

SRL is a multi-construct concept (Pintrich et al., 2000) that has been defined in several different ways. One paper (Boekaerts, 1999) described it as “an important new construct in education” (p445), dividing it up into three elements informed by research in learning styles (shallow or deep processing), metacognition and regulation and finally theories of self with goal directed behaviour. The introduction of self-regulated learning as a concept in Educational Psychology in the 1980's (Dent & Koenka, 2016) was in response to the concern that only the able minority were benefitting from the education system (Boekaerts, 1999). In this context SRL is promoted as an elixir for, not only engaging individuals in their school education, but in supporting their ability to learn independently as life-long learners. Self-regulated learning appeared to bring together two developing areas of metacognition and self-regulation that had been concurrently emerging in education and self-efficacy research (Dinsmore et al., 2008). Hattie et al. (1996) highlighted the consideration of motivational factors as crucial to determining whether a student makes use of the principles of self-regulated learning to help assess contextual and historical learning factors that may explain individual differences when strategies in use.

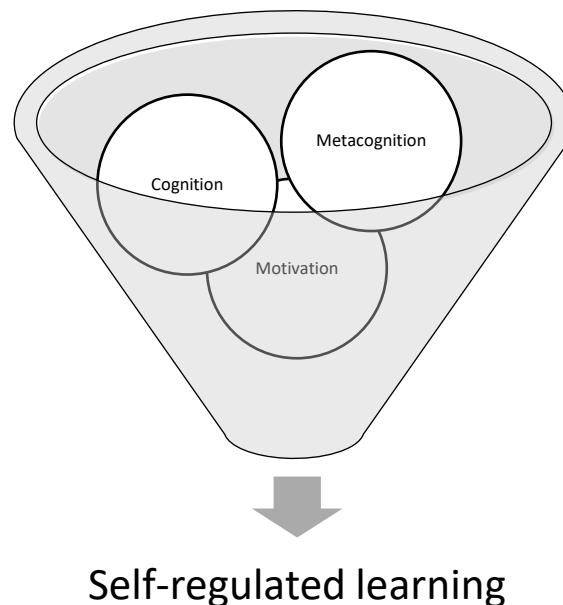
In essence self-regulated learning (SRL) is the ability (or motivation) within the learner to reflect on, what they know and their strengths and limitations as a learner (cognition), to evaluate their progress and develop new strategies (metacognition, Flavell, 1979) and tactics to use, due to that reflection and inquisitive state as a learner. Dinsmore et al. (2008) identify metacognition being

conflated for the first time with the term self-regulated learning in the 1980's. Using this description SRL then is made up of three elements: cognition, metacognition and motivation, which is aligned with Muijs and Bokhove's (2020) conceptualisation of SRL in their Education Endowment Foundation (EFF) review paper. Earlier conceptualisations of SRL included environmental decisions that learners make, such as choosing specific locations to suit the learning goals, such as quiet study places (Zimmerman, 1989). The traits of a self-regulated learner include (Zimmerman, 2002):

- Setting specific goals
- Adopting powerful strategies
- Monitoring performance
- Managing one's time
- Self-evaluating
- Recognising causation to results (the impact a study change had).

An internet search of 'images' that represent 'self-regulated learning' predominantly contain the planning, monitoring and assessment triad of metacognition. Therefore, information available to teachers can have little reference to understanding how we learn (cognition) or how motivated we are to learn, which are key components alongside metacognition (Figure 2.1).

Figure 2. 1 *Three Components that Represent Self-regulated Learning (based on Muijs & Bokhove, 2020)*



Knowledge and understanding of cognition can support students to make decisions about how to revise and reflect more accurately on the link between their own actions regarding learning and their current outcomes. It is suggested that there is a feedback loop between use of effective strategies and monitoring to reflect on the impact of strategies that is thought to underpin increased self-efficacy as a learner (Zimmerman, 1989). The more we notice that adopted strategies are effective the more competence we feel as learners. Understanding the limited capacity of working memory (Baddeley, 2003) and the need to manage cognitive load (Sweller, 2016) by activating prior knowledge and reducing content delivery into manageable chunks are key principles that are highlighted as key for teachers (DFE, 2019) but may not be automatically shared with students to make use of in their own learning behaviours. Without explicitly teaching about cognitive factors in learning it is easier for students, particularly those who find learning challenging, to derive a fixed mindset around their ability that can increase the likelihood of disengagement from future learning (Yeager et

al., 2018). There are some descriptions of metacognition which imply that cognition is part of metacognition (Dinsmore et al., 2008), however the process of understanding cognitive processes (thinking) makes sense as standing alone from the process of reflecting on them and making use of them in an applied way (planning and monitoring). For example, I might 'know' that working memory is limited and that one strategy is to use 'chunking' to reduce load, but that is different and separate to identifying in a science lesson that creating an acronym and using chunking would help to learn a list of words.

An example of teaching about 'cognition' might include building awareness of limited short-term capacity, knowledge of different memory models that explain processing theories underpinning popular revision techniques (for example the use of mind maps and graphic organisers to reduce cognitive load and highlight conceptual links).

The concept of metacognition (thinking about thinking) is the component of SRL that involves the learner considering their current information and how much of a match it is for what they are currently working on: reviewing and reflection. In line with the EEF (Muijs & Bokhove, 2020) review SRL is considered here to be an umbrella term for processes that include metacognition. Quigley et al. (2019) have highlighted the benefits of developing students' metacognitive strategies as resulting in up to 7 months of progress. However, a challenge identified is the perception of handing over the ownership of learning to students in the context of high content courses in key stage four. Often students may have metacognitive knowledge that has been picked up through their learning experiences but individuals may not always select the right strategies when given a choice

(Bingham et al., 2021). This would suggest that embedding self-regulated learning strategies into secondary curriculums would be a useful approach to supporting students to make the best use of their study skills and metacognitive abilities.

An example of metacognitive teaching would include the use of scaffolded resources that promote students making choices around what type of help will improve their work (planning) after feedback has been given (assessment). A second example might promote students use of a checklist for a piece of work to monitor how much of the criteria they have met (evaluation).

Motivation plays an important role in positive educational outcomes, with some studies suggesting that 16.6% of variance in outcomes are explained by motivation (Kriegbaum et al., 2018). Motivation's importance is highlighted in several areas within the Initial Teacher Training (ITT) core skills (DFE, 2019), with an expectation that teachers develop an understanding of how to motivate learners and understand what underpins motivation. The ITT framework specifically cautions teachers to keep in mind how using sub-groups in classroom learning can impact learners with additional needs. For example, students with executive functioning difficulties have been identified as using fewer effective learning strategies independently, this impacts their ability to experience success, which impedes their experience of the link between effort and outcome: growth mindset (Meltzer, 2018) Interventions that focus on motivation demonstrate average mean effect size $d = 0.49$ (Lazowski & Hulleman, 2016) on educational outcomes.

Motivation may be addressed in interventions through providing students with choice or agency of what they are going to work on and by providing additional support to increase access to work and build self-efficacy and confidence. An increased exposure to tasks that promote success and a focus on effort rather than outcomes is in line with growth mindset (Yeager & Dweck, 2012) that has been associated with increased levels of engagement in a task. Engagement and motivation have been both described as interlinked concepts (Putwain et al., 2016) and distinct processes where motivation is a psychological process that includes perceived competence and autonomy to complete a task, whereas engagement is the action and commitment to do so (Appleton et al., 2006).

Interventions considered in this review did not need to be manualised but did need to have explicit reference to the approaches underpinning the intervention described that mapped onto principles of self-regulated learning including metacognition as outlined.

2.2.2 Why focus on pupils with secondary aged pupils with learning disabilities?

A child is defined as having a special educational need in the UK if they have a learning disability that is significantly greater than the majority of their peers or prevents or hinders access to education provided in most mainstream settings (Department for Education & Department for Health, 2014). The term 'learning disability' is used in this review as it is consistent with the social model of disability that promotes environmental and systemic change rather than a within child approach to describing needs (Scope, 2022). Articles for review will be

included where they include young people designated as having additional needs in the context of the country or state that they are in and where that has been specified in the research paper. Rather than set up a predetermined category for inclusion the various methods of categorising young people with additional needs will be considered in the discussion.

Self-regulated learning was considered an area of exploration in secondary school students specifically as this period of adolescence is characterised by the desire to have greater autonomy (Yeager, 2018). Self-regulation epitomises the shift to a more autonomous state (Ryan et al., 2021), with SRL offering more autonomy and collaboration (Karlen et al., 2020) at the same time addressing the increased demands on students in the secondary phase of education (Dent & Koenka, 2016).

Adolescence can be defined as the period of time from puberty to adult independence (Foulkes & Blakemore, 2016). It is also an important time from a neurodevelopmental perspective (Blakemore, 2012) as brain development that is transformative to frontal lobe functioning (an area of the brain implicated in executive functioning that is necessary to make use of metacognitive strategies independently, (Roebbers & Feurer, 2015) occurs during adolescence and continues into the early twenties (Dumontheil, 2016).

In the population of students with learning disabilities it is possible their learning has been supported by additional adult support to an extent that their self-efficacy as a learner during adolescence may be even more distanced from the ideal of being autonomous and self-determining. Person-centred approaches have been

shown to increase self-esteem and motivation in students, when teachers are using non-directive methods and encouraging critical thinking (Cornelius-White, 2007). Additionally, learners with specific learning difficulties are less likely (compared to their peers who do not have additional needs) to benefit from an approach that exposes students to a range of non-evidence-based learning strategies, with a view to picking out the strategies that they prefer (Cook et al., 2009; Dent & Koenka, 2016). This suggests that for learners with additional needs the teacher needs to be making use of, and sharing, evidence-based effective teaching and learning strategies to support learners to maximise their learning capabilities.

Whilst an early review of learning strategy intervention (Hattie et al., 1996) questioned the usefulness of this approach with lower ability learners, it has since been suggested that the difficulties faced by pupils with additional learning needs can be compensated by the utilisation of maximising metacognitive abilities (EFF, n.d.; Veenman et al., 2005). Indeed, students with additional needs often have poor metacognitive skills (Bingham et al., 2021; Wang et al., 2022), with McClain et al. (2021) highlighting, for example, the learning gap widens at adolescence for those pupils with Autism. Though a difficulty is that teachers may hold beliefs around SRL that impact their choices on whether to use it and whether it is appropriate for use with lower ability learners (Karlen et al., 2020). Additionally, Karlen et al. (2020) highlight that a teacher's own previous positive experiences with using SRL in their learning journey may be a predictor of whether they promote its' use in class.

The use of metacognitive strategies with this age group and with a focus on students with learning disabilities becomes more appropriate to address both the increased need for autonomy at this age and the requirement in statutory guidance that those with additional needs are involved in the planning and monitoring of their own progress (Department for Education & Department of Health, 2015; Special Educational Needs and Disabilities Code of Practice, SEND CoP).

More broadly from the perspective of the educational psychology (EP) profession it is acknowledged that keeping a focus on methods of teaching and the classroom environment, aligns with the educational psychology ethos, certainly within the UK context, of not situating difficulties within child (Guilliford & Miller, 2015). It is helpful in an evolving profession (Fallon et al., 2010) for EPs to have clarity for teachers regarding what can be recommended as whole-class effective teaching input (universal level) when schools might otherwise prefer individual and intervention focused recommendations. EPs are trained to deliver systemic level work such as delivering school-wide CPD and with school budgets challenged and staffing levels low, whole-class initiatives are also a pragmatic solution to supporting those with additional needs.

The EFF (Muijs & Bokhove, 2020) review found that benefits of SRL were context-dependent which means that students need to be shown how to develop skills that are relevant to the subject area they are studying. This means that the use of SRL in primary contexts does not necessarily transfer to all subjects a student is likely to encounter in a secondary context unless they are instructed on how to make adaptations to their study skills (Boekaerts, 1999). With this in

mind, review articles were selected where staff in schools had delivered self-regulated learning training in person and in class, not as a technology led intervention.

The effectiveness of SRL in primary contexts does not automatically make it effective in secondary contexts as the ability to differentiate for older students becomes complicated by several factors: one is that students are not with the same teachers all day and therefore intricate understanding of a pupils needs is harder to achieve; the second is that teachers are under pressure to 'deliver' a content heavy curriculum; content delivery risks being prioritised over learning processes in this age-group. A third factor is that developmentally students in secondary are fundamentally different from their primary-selves. Not all interventions that are effective in primary populations can be delivered in the same way nor receive the same impact at secondary (Yeager et al., 2018). Developmental differences in adolescence require a shift to promoting agency (Yeager et al., 2018) and thoughtful reflection about the social context to reduce perceptions of social difference when giving support (Andrews et al., 2020) as during adolescence aligning with a social group may be a more salient motivator than meeting a teacher's needs.

2.2.3 Rationale

Whilst a large proportion of student outcomes are due to environmental and familial factors beyond the school experience (Sammons, 2014), for students at Key stage 4 (14-16 years) in the UK education system, good relationships with teachers (Cornelius-White, 2007), positive behaviour and participating in

homework were correlated with positive outcomes (Sammons, 2014) which are school-based elements. However, lessons focused on content delivery, rather than learning strategies are unlikely to fit this description and it is suggested that this would have a larger detrimental impact for those students who are recognised as having additional learning needs (Bingham et al., 2021) as those students are also implicated as having less one to one contact with teachers directly (Webster & Blatchford, 2013). Self-regulated learning promotes strategies that students can learn to use and reflect on, and facilitates a move from teacher to pupil delivery of information to student-teacher interaction within the learning process. Improving study skills through explicit instruction of techniques provides students with the ownership of their studies at a pertinent time in their education when examinations and assessment outcomes dominate. In turn, positive studying experiences may boost self-efficacy as a learner, the effects of which could then be transferred beyond the school environment. Self-determination (autonomy, self-regulation, psychological empowerment and self-realisation) has been identified as an indicator of positive post-school outcomes in young people with disabilities (Shogren et al., 2015). An important aim of education should be to arm students with the skills to take away and make use of in lifelong learning rather than rely on the direction of other adults in class (Boekaerts, 1999, Zimmerman, 2002).

Reviews dating back to the 1990's assessing the effectiveness of learning strategy interventions (Dignath & Büttner, 2008; Dignath et al., 2008; Hattie et al., 1996) demonstrate effect sizes on student performance of $d = .57$ (S.E = 0.4) and $d = 0.61$ (secondary, S.E = 0.05) and $d = 0.54$ (primary, S.E = .11) respectively for the first two reviews with Dignath et al. (2008) demonstrating that

those interventions that had a metacognitive and motivational element were most impactful for secondary aged students. However, as Donker et al. (2014) highlight in their later review these previous reviews focused on mainstream students. Donker et al. (2014) focus their meta-analysis on studies that have a control group with pre and post scores and do acknowledge differences in learner ability and review studies across primary and secondary contexts with a focus on academic outcomes. They calculated an effect size of Hedge's $g = .66$ (S.E = 0.05) concluding that academic performance is improved by instructional focused strategies. The improvement was found to benefit across a range of student characteristics (learning disabilities, average ability levels, gifted students). Donker et al. (2014) did not replicate the differences in mainstream primary and secondary outcomes noted in the Dignath & Büttner, (2008) review. Donker et al. (2014) also raise an interesting issue that outcomes measured using tests developed for the purpose of the research had slightly higher positive outcomes than those using assessments that were independent to the research process.

The meta-analysis carried out more recently by Dent & Koenka (2016) found academic performance across primary and secondary school (elementary and secondary in the US system) to be significantly correlated with both cognitive and metacognitive processes, though higher with metacognitive. Difficulty drawing conclusions comes from using self-report measure with students such as the Motivated Strategies for Learning Questionnaire (MSLQ, Pintrich et al., 1990) which is assessing students' perceptions of their use of study skills. For example, the highest subcomponent correlation with academic performance was planning, though this could be picking up the frequency of planning use in study skills rather than providing insight into the quality of the planning methods used.

Additionally, when goal setting was combined with planning a non-significant correlation was recorded further highlighting the difficulty of analysing studying behaviour, particularly where higher level metacognitive skills may have become automatic and therefore awareness of them reduced. Boekaerts & Cascallar (2006) also recognise that students have multiple goals that change over time and across subject contexts that may increase the difficulty of assessing goal oriented behaviours in a one-off questionnaire or interview.

This review appraises evidence for the effectiveness of self-regulated learning among the secondary population where the study includes students with additional learning needs and interventions that are delivered in schools by staff (rather than through computer programmes) using whole class or small group intervention. The inclusion of single case experimental designs allows for the impact of small N designs that might be more appropriate in specialist schools with their smaller group sizes and that have not been captured in previous reviews. Single case experimental designs often can describe a process of intervention that is immediately available for classroom practitioners to make use of (it is ecologically valid within a classroom environment). Educational psychologists work across multiple levels (individual, school and system levels), at the individual level, what works best to promote change in a child's educational experience can be informed by evidence-based practice from small N studies and case studies (Birch et al., 2015). Equally, supporting schools to adopt approaches to whole class teaching that are effective for the widest range of learners is also within an EP's remit. This review aims to inform the advice that educational psychologists might provide to schools regarding how to support

learners with additional needs. With this in mind the following review question was developed:

How effective are self-regulated learning techniques at improving academic outcomes for 11-16-year-old pupils with learning disabilities?

This review provides a critical appraisal of appropriate studies through a weight of evidence assessment to assess the relevance of studies to the review question and appraise the research methodology. Issues considered in this review include participant characteristics, categorisation of learning difficulties, alongside the length and nature of intervention. The review looks at the evidence base for SRL as effective for 11-16-year old students with learning disabilities and draws conclusions regarding how school staff and EP's can make use of the findings in practice.

2.3 Critical Review of Evidence Base

2.3.1 Literature search

Electronic database searches of the literature on self-regulated learning programs in secondary schools using samples that include reference to populations with Learning disabilities were initially conducted between 20th of July 2021 and 5th of August 2021 and again on 15th July, 2022. Databases searched were: PsycINFO; ERIC (Education Resources Information Centre, EBSCO); Web of Science and SCOPUS. Databases were chosen on the grounds that they contained research relevant to education and psychology of learning, as was relevant for the focus of this review. The search terms used are shown in Table

2.1. The term 'intervention' was excluded as a search term to ensure whole-class initiatives and continued professional development (CPD) were also captured in the search process. An initial pilot search comparison using the term 'intervention' and not using it showed that some research papers were removed from the search when the term was used.

A limitation of the search terms used is that the range of constructs that have developed out of self-regulated learning and metacognition is broad (Dinsmore et al., 2008) and it would not have been possible to include them all, or be aware of them all for the scope of this review. Additionally, Dinsmore et al. (2008) highlight the difficulty in reviewing papers using the key terms 'self-regulated learning' and 'metacognition', in their paper attempting to isolate the shared meaning. One barrier identified was often linked to papers that had only a passing reference to the construct whilst using the term as a key word in publication. The approach used in this current review has been used by another reviewer (Donker et al., 2014) and is a pragmatic approach to addressing a field that has many off shoots of influence and whilst working in a limited time frame. Likewise, the range of terms used to describe learners with additional needs is not inclusive of less formal terms such as 'learning difficulties', which may be used in practice. A retrospective search using the term 'learning difficulties' alongside 'self-regulated learning' and filtered for 'secondary' in Web of Science checked the assumption that this was less used terminology, yielded twenty-four results from 2000-2022 with only two relevant to this review and both studies already had been included using the search terms in Table 2.1.

Table 2. 1 *Search Terms and Boolean Operators used for Database Searches*

Focus	Context	Relevant group
Self-regulated learn*	Secondary school	Learning disability
OR	OR	OR
Self regulated learn*	Secondary education	Special educational needs
OR	OR	OR
SRL	OR	SEN
OR	High school	OR
Metacognit*		SEND

Note: “OR” combines terms. The concepts in each column were then combined using “AND” to include concepts from each section in the search.

2.3.2 Inclusion and exclusion criteria

Search limits were set at publication after 1990 to current day. Papers were included when written in English due to the time constraints of the review and dissertations were excluded as they had not been subjected to the rigour of the peer-review process. Peer-reviewed journals articles were included to ensure that a previous checking process has been carried out on the studies included. Where the search database options allowed, books and dissertations were excluded at point of search, where this was not an option they were removed during the review phases.

Abstracts and articles were assessed for their eligibility using the inclusion and exclusion criteria set out in Table 2.2. Following the implementation of the search strategy illustrated below (Figure 2.2), Table 2.3 shows a list of included studies. Studies excluded at the full paper review stage are listed in Appendix C along with the reason for exclusion. Figure 2.2 shows (in brackets) in the first box a breakdown of papers found in the initial 2021 search and those added at the 2022 search point.

Petticrew and Roberts (2003), suggest, that research questions asking ‘how effective...?’ an intervention or strategy is should refer to randomised control trials, cohort studies and quasi-experimental research, which were included in this review. However, Horner et al. (2005) also suggest that within the learning disability population single case study designs are invaluable sources of evidence on what works and are effective in highly externally valid contexts. As the need to determine if interventions are effective within the school system is relevant to this review question single-case experimental designs (SCEDs) were also included when they met the inclusion criteria listed. All the studies included in this review were assessed for one outcome that could be directly linked to academic skills. Research papers that solely focused on cognitive outcomes, such as self-efficacy of the learner, were not selected for the purpose of this review, which focused on ‘evidence’ for academic improvement rather than ‘predictors’ of academic achievement.

Table 2. 2 *Inclusion and Exclusion Criteria*

Exclusion codes	Inclusion criteria	Exclusion criteria	Rationale
1. Participants	Students aged from 11 to 18 years old.	Children younger than 11 years, older than 18 years.	The review examines effectiveness data appropriate for secondary school using the UK education system as a definer of age of 'secondary education'.
	Students with learning disabilities included or sole focus of study.	Learning characteristics of population not included.	
2. Intervention	Interventions and teaching strategies that support the introduction and use of self-regulated learning strategies or interventions that promote SRL or metacognitive skills that can be made use of in a whole class context.	Interventions described only. Interventions or training that is entirely carried out using online resources.	This review considers the effectiveness of strategies that are appropriate for delivery in secondary school classrooms and can be reasonably adapted for a range of subjects.
3. Comparison	Pre and post data from RCT's, cohort studies, quasi-experimental designs and single-case experimental designs.	Qualitative reports of outcome.	This review explores if there is a time by intervention interaction. (Petticrew and Roberts, 2003, typology of evidence)

Exclusion codes	Inclusion criteria	Exclusion criteria	Rationale
4. Outcome	Report a quantitative pre and post-outcome measure that is relevant to academic improvement in a secondary school class subject.	Quantitative outcome measures that are solely linked to cognitive or emotional predictors of study skills (e.g. self-efficacy or motivation). Qualitative analyses of difference in study skills or academic outcomes.	This review is assessing the impact on learning (academic outcomes).
5. Context	Secondary school or special school classroom context	Interventions that are not carried out within an educational setting.	Focus of the review is application of self-regulated learning strategies to classroom learning and educational contexts.
6. Publication date	1990-2022	Before 1990	To ensure only contemporary studies are included, studies before 1990 were not included.

Exclusion codes	Inclusion criteria	Exclusion criteria	Rationale
7. Peer reviewed journals	Search limit used where possible	Books, dissertations. Written in a language other than English.	To include articles that had been through a rigorous peer review process already. To remove papers where meaning would be lost in translation.

Exclusion code numbers (Table 2.2) are used in the flow diagram below to show reasons for exclusion at each stage (Figure 2.2).

Figure 2. 2 *PRISMA with Search Details*

PRISMA flow diagram.

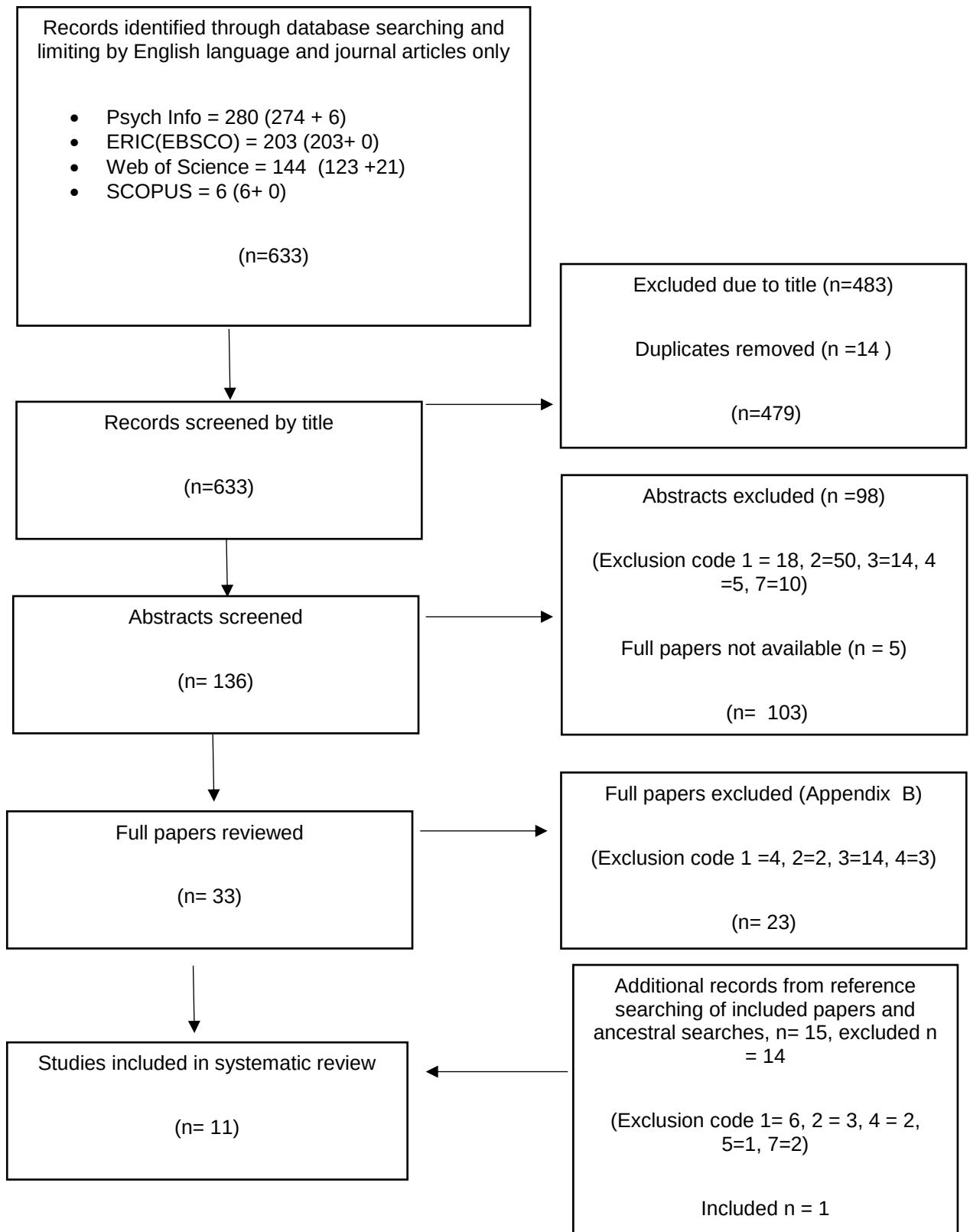


Table 2. 3 *Full References of the Final Studies Included in this Review*

Reference	
1	Berkeley, S., Mastropieri, M., & Scruggs, T. (2011). Reading Comprehension Strategy Instruction and Attribution Retraining for Secondary Students With Learning and Other Mild Disabilities. <i>Journal of Learning Disabilities</i> , 44(1), 18-32.
2	Berkeley, S., Marshak, L., Mastropieri, M., & Scruggs, T. (2011). Improving Student Comprehension of Social Studies Text: A Self-Questioning Strategy for Inclusive Middle School Classes. <i>Remedial and Special Education</i> , 32(2), 105-113.
3	Büyüknarci, Ö., & Grünke, M. (2019). The Effects of a Metacognitive Strategy on the Persuasive Writing Skills of Adolescents with Hearing Impairment and Learning Disabilities. <i>Insights into Learning Disabilities</i> , 16(2), 139–152.
4	Cuenca-Carlino, Y., Freeman-Green, S., Stephenson, G., & Hauth, C. (2016). Self-Regulated Strategy Development Instruction for Teaching Multi-Step Equations to Middle School Students Struggling in Math. <i>The Journal of Special Education</i> , 50(2), 75-85.
5	Firat, T. & Ergul, C. (2019). Effects of the TWA Strategy Instruction on Reading Comprehension of Students with Learning Disabilities. <i>Educational Research Quarterly</i> , 43(2), 24-54.
6	Gomaa, O. M. K. (2016). The Effect of Metacognitive Strategy Training on Science Process Skills and Science Self Efficacy among First Year Prep Students with Learning Disabilities. <i>Online Submission</i> , 5(3), 121–129.
7	Hacker, D., Kiuvara, S., & Levin, J. (2019). A metacognitive intervention for teaching fractions to students with or at-risk for learning disabilities in mathematics. <i>ZDM</i> , 51(4), 601-612.

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- 8 Hoover, T., Kubina, R., & Mason, L. (2012). Effects of Self-Regulated Strategy Development for POW TREE on High School Students with Learning Disabilities. *Exceptionality : The Official Journal of the Division for Research of the Council for Exceptional Children*, 20(1), 20-38.
 - 9 Lizarraga, M., & Iriarte, M. (2001). Enhancement of Cognitive Functioning and Self-Regulation of Learning in Adolescents. *The Spanish Journal of Psychology*, 4(1), 55-64.
 - 10 Montague, M. (1992). The Effects of Cognitive and Metacognitive Strategy Instruction on the Mathematical Problem Solving of Middle School Students with Learning Disabilities. *Journal of Learning Disabilities*, 25(4), 230–248.
 - 11 Weisberg, R., & Balajthy, E. (1990). Development of Disabled Readers' Metacomprehension Ability through Summarization Training using Expository Text: Results of three studies. *Journal of Reading, Writing, and Learning Disabilities International*, 6(2), 117–136. <https://doi.org/10.1080/0748763900060204>
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2.3.3 Weight of evidence

A quality appraisal was carried out for all of the included studies using the Weight of evidence (WoE) framework (Gough, 2007) across three domains to create an overall appraisal of the studies included for review (Weight of Evidence D). The Gough (2007) framework was utilised to facilitate objective judgements across three elements of the studies reviewed. The WoE D appraisal included consideration of three elements suggested by Gough (2007): WoE A that assesses the quality of the type of evidence identified for this review; WoE B that assessed a review specific judgement about appropriateness of this evidence for this review; and WoE C that assessed

the appropriateness of the focus of the evidence for the purposes of this review.

Two different coding protocols were used to assess weight of evidence A (WoE A). An adapted version of the Gersten et al. (2005) coding protocol (Appendix D) was applied to studies that report using an experimental or quasi-experimental research design (Appendix E) and was selected due to being appropriate for use with research addressing special educational needs. Horner et al. (2005) produced a coding protocol for studies that reporting single-case experimental designs, this was adapted for use in this review (Appendix F) as suggested by Cook et al. (2009) to suit the needs of this review. Table 2.4 shows the overall scores allocated for WoE A with details on how they were scored and ranked as high, medium or low (Appendices E and G). Studies coded using the Gersten et al. (2005) protocol were given a score for both 'essential' and 'desirable' included qualities and, as suggested by Gersten, a greater score under the 'essential' criteria influenced the overall outcome of WoE A in comparison to high scores in 'desirable' criteria.

Gough (2007) referred to Weight of Evidence B as 'a review specific judgement about the appropriateness of that form of evidence for answering the review question, that is the fitness for purpose of that form of evidence.' As this process was described as 'review specific' a coding protocol for WoE B was designed for this review (Appendix H) and was suitable to use across all eleven included studies regardless of their design (Appendix I).

WoE C was also created specifically for this review (Appendix J) to determine if the research suited the focus of this review question: can the research tell us how effective self-regulated learning is for those within whole class groups who experience substantial difficulties with their learning? To reflect this assessment studies were only rated high when carried out in whole class delivery of the intervention and where students with learning disabilities had been clearly identified in the academic outcome data analysis.

WoE D was then assessed to give an overall perspective on the quality and appropriateness of the research for the purposes of this review (Table 2.4). Justification for the scoring of WoE D is given in Appendix K. Equal importance was placed on all three WoE contributions to D, which is reflected in the outcome of 55% of WoE D in this review being consistent with the WoE A ratings, compared to 70% reported by Gough (2007) in a selection of research papers that were sampled. This check demonstrates that the method of research has not disproportionately influenced the judgement in the appraisal process, important when considering more than one methodology in a review.

Table 2. 4 Overall Weight of Evidence for Included Studies (*essential and desirable split for experimental and quasi-design studies only)

Study	Weight of Evidence A		Weight of Evidence B	Weight of Evidence C	Weight of Evidence D	Overall Weight of Evidence
	*essential	*desirable				
Berkeley et al. (2011)	10/10	10/10				
	20/20 High		8/10 Medium	2/3 Medium	Medium	
Berkeley, Marshak et al. (2011)	9/10	4/10				
	13/20 Medium		8/10 Medium	1/3 Low	Medium	
Büyüknarci & Grünke (2019)	10/20 Low					
			4/10 Low	2/3 Medium	Low	
Cuenca-Carlino et al. (2016)	20/20 High		9/10 High	2/3 Medium	High	
Firat, T. & Ergul, C. (2019)	Low (14/20)		Medium (7/10)	Medium (2/3)	Medium	

Study	Weight of Evidence A		Weight of Evidence B	Weight of Evidence C	Weight of Evidence D	Overall Weight of Evidence
	*essential	*desirable				
Gomaa, 2016	4/10	1/10	Medium (8/10)	High (3/3)		Medium
	low					
Hacker et al. (2019)	7/10	3/10	Medium (8/10)	Low (1/3)		Low
	Low					
Hoover et al. (2012)	High (20/20)		Medium (8/10)	Medium (2/3)		Medium
Lizarraga & Iriarte (2001)	7/10	2/10	Low (5/10)	High (3/3)		Medium
	Low					
Montague, M. (1992)	High (17/20)		Medium (7/10)	Medium (2/3)		Medium
Weisberg & Balajthy (1990)	2/10	1/10	Low (5/10)	Medium (2/3)		Low
	Low					

Note: Weight of Evidence ratings are explained in Appendices B, D, H and I.

2.3.4 Participants

Table 2.5 includes a breakdown of participant details for each paper. The reviewed studies include 397 students predominantly secondary age (11 to 16 years in the UK system) though a few studies overlapped due to middle school systems covering an overlap of top end of primary and lower secondary age ranges. Participants were from the USA in seven studies (Berkeley et al., 2011; Berkeley, Marshak et al., 2011; Cuenca-Carlino et al., 2016; Hacker et al., 2019; Hoover et al., 2012; Montague, 1992; Weisberg & Balajthy, 1990) and other participants were from Egypt, Spain, Germany and Turkey, making it hard to generalise the findings directly to the UK education system. Only three studies (Berkeley et al., 2011; Cuenca-Carlino et al., 2016; Hoover et al., 2012) were rated highly by WoE A criteria for reporting participants details, how participants were organised to increase comparability across groups and described the people who carried out the interventions clearly (Appendices C and E). This reflects part of the difficulty in assessing the impact of self-regulated learning techniques in vulnerable groups, as those participants defined as having a 'learning disability' will have different profiles in different educational settings or for different interventions making it challenging to compare across research papers.

Table 2.5 details the categorisations of learning disability used for each study, for example some participants were recruited from a special school context (Büyüknarci & Grünke, 2019; Montague, 1992; Weisberg & Balajthy, 1990), some students were defined as having a learning disability in a mainstream setting (Berkeley et al., 2011; Berkeley, Marshak et al., 2011;

Hoover et al., 2019) and in one study participating students had a specific difficulty in maths (Cuenca-Carlino et al., 2016).

An almost even split of the research reviewed did and did not give clear information about the intervention agents in the studies (Table 2.5, those that did n= 6 versus, those that did not n= 5, Appendix E). This is an area that challenges generalisation of intervention effects as intervention agents ranged from researchers (5 studies) to teachers (5 studies) some with specialist qualifications through to student mentors (one study). Two SCED studies that included information regarding those delivering the intervention (Cuenca-Carlino et al., 2016; Hoover et al., 2012) had high WoE A ratings. Montague (1992) still rated high for WoE A without information regarding who carried out the intervention showing that a range of information influenced the outcomes, despite this being a key element for educational researchers in terms of applying into school practice. The same inconsistency can be seen across the experimental and quasi-experimental design studies, with information about intervention leaders not being a determinant for a high WoE A rating.

In the six studies reviewed using experimental or quasi-experimental designs only one (Berkeley et al., 2011) referred to attrition rates despite the usefulness of this data in larger group studies to assess the acceptability of interventions in the target populations, this study had a high WoE A rating whereas the other five studies received medium (one) or low (three) ratings (Table 2.4).

Table 2. 5 *Mapping the Field: A Summary of Key Data on Participants, Context and Intervention for Each of the Included Studies*

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
1.Berkeley et al. (2011) USA Medium	59 participants. Average age 14.6 Mixed ethnicity middle and high school (East Coast). 11 males, 8 females were participants in the Reading Comprehension strategy only group. 63 targeted (attrition n = 18) WoE A score for participant information and selection 3/3	All with learning disabilities (defined by the district criteria and in the paper as a “severe discrepancy between ability and achievement”) and a ‘normal’ IQ range and below average age performance on Stanford diagnostic reading test (SRDT). Students selected from English or accelerated reading classes.	Instruction over 4-week period for 12 30-minute sessions (total of 360 minutes) with a 6-week delayed post-test	Teacher delivered. Random assignment of students and teachers into groups of 7 students per class. Reading comprehension strategy (RCS – setting purpose, previewing, activating background knowledge, self-questioning, summarising and strategy monitoring) compared with RCS and attribution retraining (AR) and Reading Naturally comparison condition.

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
2.Berkeley, Marshak et al. (2011)	57 (28 males, 29 females) students from 7 th grade with mean age 13.28 years (11-12 years).	Mixed group of students from an inclusive school, including those with learning disabilities with IQ ranging 78- 101 (assessment not specified).	20-minute lessons for 3 days.	Teacher delivered.
USA	40% white, 35% Asian, 12% Hispanic, 12% African-American.	35 students in general education and received no specific support.		Random assignment of students and teachers to self-questioning strategy or comparison typical practice group for reading comprehension.
Medium	23% EAL WoE A score for participant information and selection 2/3	15.8% (learning disability n = 5, health impairment n = 1, hearing impairment n = 1 and other n =1) of sample identified for special education services.		Self-questioning strategy – students are taught how to use headings and sub-heading to create comprehension questions before reading a text which they then use to answer questions on the text after reading (planning, monitoring own progress across a reading session). Strategy steps and monitoring sheets provided to scaffold process.

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
3.Büyüknarci & Grünke (2019)	4 females, 15-18-year old.	All participants were recruited from a special school context.	30-minute sessions daily over 12 school days.	Tutor led, peer tutoring version of Self-Regulated Strategy Development (SRSD) for writing using the 'FIX' strategy following instruction on what constitutes good persuasive writing and a taught example of using FIX with coloured cards for each step.
<i>Germany</i>	WoE A score for participant information and selection 1/3			FIX= Focus on essay elements, Identify problems, Execute changes.
Low				
4.Cuenca-Carlino et al. (2016)	6 'middle school' students (5 females, 1 male) 11-13 years old.	Participants were included if they had either a learning disability or maths difficulties.	12 weeks	Teacher delivered.
<i>USA</i>			45 mins per day, 4 days per week.	SRSD model of instruction for maths intervention.
High	WoE A score for participant information and selection 3/3		Post-instruction maintenance assessed at week 4 and 5 post-instruction.	Develop background knowledge, discuss it, model it, memorise it, guided practice and independent practice.

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
*5.Firat, T. & Ergul, C. (2019) <i>Turkey</i> Medium	3 students (2 female, 1 male), 11-year olds. WoE A score for participant information and selection 0/3	All three students had 'diagnosed' learning disabilities alongside reading fluency and accuracy levels that enabled them to participate in using this strategy. A baseline comprehension measure was used to check they had some comprehension level at start (minimum 2/13 score used as cut off point).	8 weeks of session on 2 days each week (session lengths varied from 35-minutes to 1 hour 30 depending on phase of intervention, breaks were given in longer sessions). Maintenance checked in follow up session 3- and 6-weeks post-instruction.	Researcher delivered intervention. Comprehension. SRSD for reading 'TWA' (think before reading, think while reading and think after reading – development of pre-requisite skills, discussion of strategies, modelled by teacher, guided practice, implementing strategies and independent practice).
6.Gomaa (2016) <i>Egypt</i> Medium	60 male participants, average age 13 years. WoE A score for participant	All students with learning disabilities. 'Diagnosed' by teacher or learning disability screening test.	3 training sessions per week lasting 40-45 min each. Number of weeks delivered not given.	Teacher delivered intervention. Participants randomly divided into experimental or control. Metacognitive strategy training for science process skills (knowledge about cognition in general and

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
	information and selection 2/3	All participants were reported as having IQ's between 90-118.	Follow up assessment of maintenance after 1 month.	about self as learner, planning, monitoring and evaluation)
7.Hacker et al. (2019) USA Low	59 students (33 males, 26 females) from grades 4-6. WoE A score for participant information and selection 2/3	64% of participants had moderate learning disabilities specific to maths and 36% were 'at risk' learners in maths.	Adults were trained for 2 days. Delivered 6 lessons, 45 minutes three times per week. Control group received standard re-teaching of maths from curriculum.	Teacher delivered. Randomly assigned teachers and students to control or treatment group. Self-regulated strategy development (SRSD) used to create 'FACT'+R ² C ² (figure it out, act on it, ,compare with a peer, tie it up in an argument: restate, reasons, counterclaim, conclusion) applied to written explanations of solving fractions.
8.Hoover et al. (2012)	4 female students, 16-19 years.	All participants were described as students with learning disabilities in a mainstream context	Covered 71 calendar days.	Researcher delivered intervention. Self-regulated strategy development (SRSD) for

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
<i>USA</i> Medium	WoE A score for participant information and selection 3/3	who were receiving additional support and selected because writing support was deemed as appropriate to their area of need/IEP targets. IQ scores ranged from 79,79, 85 and 101. IQ assessed by either Weschler intelligence test for children (WISC 3 or 4 or Weschler individual achievement test (WIAT).	5 instructional lessons spread across different time scales for each participant due to multiple baseline design. Between five and six post-instructional sessions to assess maintenance.	POW+TREE (pick an idea, organise my notes, write and say more: Topic, reasons, explain, endings).
9.Lizarraga & Iriarte, (2001) <i>Spain</i> Medium	109 students (27 males, 82 females), average age 15. WoE A score for participant	All participants were described as having learning disabilities and behavioural problems	Across a school year. 5 weekly classes of 45 minutes were delivered.	Researcher delivered intervention. Two schools randomly assigned to control or experimental. Experimental: portfolio of tasks derived from 3 established educational programs that included training, in complex cognitive tasks

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
	information and selection 2/3			(decision making and problem-solving), self-regulation of learning (planning, monitoring and evaluating) and use of individual and cooperative learning skills.
10.Montague, M. (1992). USA Medium	6 pupils (3 males, 3 females) 11 to 13-year olds. WoE A score for participant information and selection 1/3	All participants were described as having learning disabilities (defined by inclusion in state learning disability program). Academic ability below that of intellectual functioning. Full scale IQ score of 90 or better (WISC-R). Poor performance on mathematical word problems.	55-minute individual direct instruction during maths classes across four months (February to June). Temporal generalisation (maintenance) testing following October and January.	Researcher delivered intervention. Scripted lessons using the cognitive-metacognitive model of mathematical problem-solving. Treatment 1 cognitive strategy instruction to one group and metacognitive strategy instruction to one group. Treatment 2 the reverse of the above until all are trained in both.

Study and Overall Weight of Evidence D rating	Participants	Categorisation of learning disabilities.	Length of intervention	Nature of intervention
11.Weisberg & Balajthy (1990) <i>USA</i> Low	24 students (21 males, 5 females), average age 13 years 4 months. WoE A score for participant information and selection 0/3	All participants were students at a special school for improving reading. Participants were described as having learning disabilities associated with reading difficulties. Assessed as having 'average' IQ's (WISC-R).	5 days instruction.	Researcher delivered intervention. Metacognitive instruction for recall of information from expository texts. Modelling, feedback and reflection on their own work at extracting meaningful elements out of text using underlining, summarising and comprehension tests. Pre-test, post-test design (no control group).

2.3.5 Research design

The studies either used pre and post-test designs with control groups for comparison (n = 6; Berkeley et al., 2011; Berkeley, Marshak et al., 2011; Gomaa, 2016; Hacker et al., 2019; Lizarraga & Iriarte, 2001; Weisberg & Balajthy, 1990) or made use of a multiple baseline single case study design (n = 5; Büyüknarci and Grünke, 2019; Cuenca-Carlino et al., 2016; Firat, 2019; Hoover et al., 2012; Montague, 1992). The combination of quasi-experimental research and single case designs provides a broader perspective on what works for those students with additional needs as the outcome data covers the ecologically valid situation of whole class teaching alongside the nuanced perspective of multiple baseline studies. An example of the benefit of including multiple-baseline designs can be seen in the findings in the Büyüknarci and Grünke (2019) study, that was rated low for WoE A and overall for WoE D, however does show very different outcome data for one participant compared to the other three participants. This demonstrates that individual differences in learner experiences can be glossed over by larger group studies (Table 2.6).

Four, out of the six, experimental pre and post design studies included were rated 'medium' for WoE D which reflected the overall assessment (Berkeley et al., 2011; Berkeley, Marshak et al., 2011; Gomaa, 2016; Lizarraga & Iriarte, 2001), with the remaining two rated 'low' (Table 2.4 shows rating for each WoE criteria). The quality of the type of evidence (WoE A) was low for four of the experimental studies (Gomaa, 2016; Hacker et al., 2019; Lizarraga & Iriarte, 2001; Weisberg & Balajthy, 1990) with Appendix E

showing that the studies were rated low across different elements (e.g. little detail of the intervention in the case of Gomaa, 2016 and few participant details were given in the Lizarranga & Iriarte, 2001 study). The multiple baseline research designs were rated across all three categories of WoE D of high (Cuenca-Carlino et al., 2016), medium (Firat, 2019; Hoover et al., 2012; Montague, 1992) and low (Büyüknarci and Grünke, 2019). In fact, the only 'high' WoE D rating from all eleven studies reviewed was a multiple baseline design (Cuenca-Carlino et al., 2016). All five of the single case experimental design studies were rated as medium for WoE C (Appendix J) which assessed the suitability of the studies for this review question, showing a consistency in this respect that is not evident in any of the other WoE criteria, when considered as a whole or comparing between research types.

2.3.6 Intervention

Four of the included studies focused on developing comprehension skills (Berkeley et al., 2011; Berkeley, Marshak et al., 2011; Firat, 2019; Weisberg & Balajthy, 1990). With the exception of the Berkeley et al., (2011) study (that had a medium effect size) the other three studies focused on comprehension skills had large effect sizes. Students benefitted from using headings and sub-headings to plan what they would be looking out for before reading a text (Berkeley, Marshak et al., 2011) and having this process modelled by the researcher (Firat, 2019; Weisberg & Balajthy, 1990).

In common with the Firat (2019) study that used Self-regulated strategy development (SRSD) for comprehension two studies focused on writing skills

and two on maths skills also reported the use of the SRSD framework.

Essentially SRSD provides a strategy framework that can be modelled and then used independently by students which involves following six stages of instruction including modelling and time spent memorising the strategy before using it alone. One such example for writing is POW-TREE (Pick my idea, Organise my notes, Write and say more; Topic, Reasons, Explain, Endings, Hoover et al., 2012) and TWA (Think before reading, think while reading, think after reading) for reading comprehension (Firat, 2019). Two studies addressed maths interventions (Cuenca-Carlino et al., 2016; Montague, 1992). Montague (2016) compared order of delivery of the process skills (cognitive instruction) and metacognitive skills in different orders to highlight an increased impact (Table 2.6, large effect size shown) of teaching metacognitive process (which in this study were making use of 'say', 'ask' check' as overriding process labels at each stage of problem solving) rather than teaching process skills first (medium effect size was still evident). Planning and monitoring skills alongside learning about cognition skills generally were key elements in both the Gomaa (2016) study focused on science process skills and the generic thinking skills support in Lizarraga & Iriarte's (2001) study that both scored medium for WoE D and had medium effect sizes.

Arguably the single case experimental design (SCEDs) research was helpful at picking up or hinting towards individual differences in how helpful this intervention style is. For example, Büyüknarci and Grünke (2019) report their final participant only had 5 intervention sessions (the most received being 8 sessions) in their multiple-baseline design and this participant was the only

one who had a non-significant Tau. In the Cuenca-Carlino et al. (2016), the only study rated highly for WoE D, one participant showed no maintenance effects compared to the others in that multiple baseline case study design (Table 2.6). Both of these exceptions to the otherwise positive case study findings suggest that whilst the benefit of the interventions promoting self-regulated learning techniques (such as planning and organising work focused strategies) benefited most of the learners in the reviewed studies with special educational needs, some will require further support to make use of them over time or may require longer training periods. The benefit of the use of SCEDs here shows the individual differences in outcomes that appear clearly when studying smaller groups. However, as mentioned previously the quality appraisal of the multiple baseline designs showed greater variation in their ratings for WoE A and B than the pre and post, control group studies, suggesting there is less commonality between single case experimental designs. Consistency was not always a negative element as the consistency for experimental studies in WoE A was that four of the six were rated low, as mentioned earlier.

2.3.7 Measures

A difficulty in this review was the focus on 'academic outcomes' which had to be broadly interpreted in order to include a range of studies. 'Academic outcomes' was interpreted, for this review, as outcomes that were linked to assessment of pupils that might reasonably be expected to occur in classroom situations (comprehension tests and end of topic content tests) and not those that were aligned with the outcomes just relevant to the

research focus (how many parts of the intervention that were observed being used at the assessment phase). This process, it should be acknowledged, includes bias as this reviewer is familiar with the UK educational system and forms of assessment.

With regard to WoE A outcome measures were appraised for experimental design using two questions (Appendix D):

- Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalised performance?
- Were outcomes for capturing the intervention's effect measured at the appropriate times?

For single case experimental designs, the relevant questions were (Appendix F)

- Dependent variables are described with operational precision.
- Each dependent variable is measured with a procedure that generates a quantifiable index.

An example of where the outcome measures scored highly are in the Berkeley et al. (2011) paper that used a comprehension summarisation test with passages that hadn't been used as part of the intervention to assess student generalisability of skills and were backed up with established measures assessing pupils' metacognitive perspectives generally (Meta-comprehension strategy Index, MSI, Schmitt, 1990) and with specific regard

to reading (Reading attribution scale, RAS, Shell et al., 1995). Pupils were tested pre, post and delayed over a 4-week intervention programme. Details were also provided as to the types of comprehension questions used. Weisberg & Balajthy (1990) in contrast was appraised low for outcome measures as it carried out post-testing on day 7 after 5 days of instruction, using a multi-choice comprehension test developed for the purposes of their intervention and with no additional assessment made to support outcome conclusions. Two experimental studies (Hacker et al., 2015; Gomaa, 2016) did not provide enough information to appraise the appropriateness of the time interval for their measures. These studies scored low therefore on Weight of Evidence A.

In the single experimental case design studies Büyüknarci & Grünke, (2019) is an example that was considered as meeting the appraisal criteria for outcome measures as they used 12 text prompts (each listed in their paper and the scoring matrix is available on request) to assess the use of the writing strategies that were part of the intervention and assigned a rating out of 3, the scoring system used was blind to the participants as it was carried out by a research assistant with a reliability check in place (reliability coefficient of 0.84). As might be expected, due to the nature of SCEDs all of those studies met the appraisal guidelines for outcome measures, setting an outcome measure is key to the design of SCED's.

2.3.8 Findings

Outcomes and effects sizes are identified in Table 2.6. Where no effect sizes were given in the original paper pre and post mean and standard deviation data were used with online effect size calculator tool (*Wilson, n.d.* in the quasi-experimental designs) to calculate Cohen's *d* (1992) as suggested when designs compare mean outcomes. Data from the multiple baseline graphs was used to calculate Tau for the single case experimental designs (Vannest et al., 2016). Parker and Vannest (2009) were followed with regards to determining the effect size descriptor for Tau, and a Tau of greater than 0.85 was considered a strong (large) effect.

Table 2. 6 A Summary of Pre and Post Data (where relevant and where provided) and Effect Sizes of Academic Outcome Findings from the Included Studies

Study	Weight of Evidence D rating	Outcome measure and Findings	Effect size
Berkeley et al. (2011)	Medium	Outcome measure linked to academic outcome: Comprehension measures. Pre and post Intervention with Reading Comprehension Strategy + Attribution Retraining • Pre m = 3.80 (SD= 1.28) • Post m = 7.50 (SD = 2.18) Control with Read Naturally • Pre m = 3.95 (SD = 1.46) • Post m = 4.83 (SD = 1.52) Significant main effect for condition $F(1,39) = 11.26$, $p = .000$. Bonferroni adjustment found Reading Comprehension Strategy +Attribution Retraining $p = .000$ ($d = 1.44$) and Reading Comprehension Strategy $p = .005$ ($d = 0.94$) Post-test In Reading Comprehension Strategy only group medium effect size ($d = .71$).	$d = .71$
Berkeley, Marshak et al. (2011)	Medium	Outcome measure linked to academic outcomes: Multiple choice comprehension questions. Intervention Pre m = 6.70 (SD 2.54). Post m = 10.30 (SD 3.54) Control pre m = 6.30 (SD = 2.00) post m = 7.70 (SD = 2.11) (effect size reported from post-test, large effect size $d = 0.92$)	$d = 0.92$
Büyüknarç i & Grünke (2019)	Low	Outcome measure linked to academic outcomes: Grade on persuasive writing task. Large effect sizes for all except Ppt.4 data which shows a small effect size	Ppt. 1: Tau = 0.97 Ppt. 2: Tau = 0.94 Ppt. 3: Tau = 1.00 Ppt. 4: Tau = 0.17
Cuenca-Carlino et al. (2016)	High	Outcome measure linked to academic outcomes: performance on test solving maths equations. Ppt 1: (Maintained benefits).	Ppt 1: Tau = 1.00 Ppt 2: Tau = 1.00 Ppt.3: Tau = 1.00

		Ppt 2: (No maintenance of benefits). Ppt.3: (Maintained benefits). Ppt. 4 (Maintained benefits). Ppt. 5 (Maintained benefits). Large effect size	Ppt. 4 Tau – 1.00 Ppt. 5 Tau = 1.00
*Firat &Ergul (2019)	Medium	Outcome measure linked to academic outcomes: Reading comprehension test of 16 questions devised for 2 texts by researcher. Ppt. 1: *PND = 100% Ppt 2: *PND = 100% Ppt.3: *PND = 100% Baseline comparison with intervention and maintenance pooled average across the three participants: $\wedge$Tau = 1.00, $p = <0.001$ (CI 95% = 0.5644 – 1). Large effect size	$\wedge$ Tau = 1.00
Gomaa (2016)	Medium	Outcome measure linked to academic outcomes: Science process skills test (devised for study made up of 22 basic and integrated science skills). Post-test comparison of differences between the experimental and control group: $t(58)=11.67$, $p = 0.01$, $\wedge d=3.01$. Large effect size	$\wedge d=3.01$
Hacker et al. (2019)	Low	Outcome measure linked to academic outcomes: 25-item multi-choice test on fraction knowledge. Effect sizes only reported. Gains in fraction knowledge for intervention group Hedges $g = 0.60$ Medium effect size.	Hedges $g = 0.60$
Hoover et al. (2012)	Medium	Outcome measure linked to academic outcomes: Quick writes written tasks assessed for 'TREE' elements. Baseline comparison with intervention and maintenance pooled average across the three participants: Participant 3 did not improve above baseline and Participant 2 showed small levels of impact of intervention. $\wedge$Tau = 0.82, $p = <0.001$ (CI 95% = 0.50-1). Large overall effect size	Ppt 1: *PND 87.5 Ppt.2: *PND 57.1 Ppt.3: *PND 0 Ppt.4: *PND 100 Overall $\wedge$Tau = 0.82

Lizarraga & Iriarte, (2001)	Medium	Outcome measure linked to academic outcomes: Culture Fair Intelligence Test Scale 3. Post-test means comparison of experimental and control group $t(107) = -2.61$, $p < 0.01$, $d = 0.6$ Medium effect size	$d = 0.6$
Montague (1992)	Medium	Outcome measure linked to academic outcomes: Score on mathematical word problems test (10 one, two and three step word problems). Baseline comparison with intervention and maintenance pooled average across the three participants. Cognitive strategy instruction (CSI) first then Metacognitive strategies (MSI). $\tau = 0.63$, $p = 0.0048$ (CI 95% = 0.19-1), medium effect size. Metacognitive strategies instruction first then cognitive instruction. $\tau = 0.87$, $p < 0.001$ (CI 95% = 0.44-1), large effect size.	CSI then MSI = $\tau = 0.63$ MSI then CSI = $\tau = 0.87$
Weisberg & Balajthy (1990)	Low	Outcome measure linked to academic outcomes: Comprehension test of social studies textbook. $F(1,25) = 12.97$, $P < .001$, $d = 1.41$, large effect size	$d = 1.41$

**Author reported visual analysis only. *PND = percentage of non-overlapping data calculated for this review. ^calculated for this review: Tau calculated for baseline versus intervention and maintenance data for all three participants using Vannest et al. (2016) online tool. Cohen's d effect size calculated using Wilson (n.d.) online tool and labelled using Cohen (1992) descriptors of effect sizes as small, medium and large.*

Looking at the data in Table 2.6 it is evident that studies included in this review show predominantly large effects sizes related to academic outcomes within learning disability populations. Eight of the eleven included studies report large effect sizes (Berkeley, Marshak et al., 2011; Büyüknarci & Grünke, 2019; Cuenca-Carlino et al., 2016; Firat, 2019; Gomaa, 2016; Hoover et al., 2012; Montague, 1992; Weisberg & Balajthy, 1990) and the remaining three studies report medium effect sizes (Berkeley et al., 2011; Hacker et al., 2019; Lizarraga & Iriarte, 2001). This is compelling evidence that interventions that include the elements of self-regulated learning (prior knowledge, planning, monitoring and evaluation) are effective in improving academic outcomes for those pupils who are vulnerable to underachievement due to their learning disabilities. However, as only one of the reviewed studies (Cuenca-Carlino et al., 2016) scored 'high' for overall (WoE D) this highlights that for those studied reviewed there was not a link between how rigorous the research processes were and the effect of the intervention. There are questions about the reliability and validity of the assessment methods used (WoE A) as six of the studies scored 'low' on this part of the appraisal. Studies were more likely to score 'high' and 'medium' on the WoE B and WoE C elements of appropriateness of methods and appropriateness to question posed. A potential explanation is that published studies have to work to a word limit that may impact the detail that they report, some of which would be relevant to 'quality of research' (WoE A) evaluation, such as fidelity processes and attrition rates.

Interestingly, two studies that did score 'high' for WoE A studies (Berkeley et al., 2011; Montague, 1992) were able to pick out what elements of the processes were

most helpful to student outcomes. For example, Montague (1992) split elements of the intervention up into metacognitive strategy instruction (MSI) and cognitive strategy instruction (CSI) and delivered all parts to all participants but in differing orders. The use of counterbalancing allowed for a comparison of results and the findings suggest that the MSI as first delivery had greater impact (large effect size compared to medium effect size when CSI was delivered first). Allowing us to hypothesise about the need for metacognitive elements of training, such as training, modelling and guided practice first alongside being taught specific strategies (read first, then paraphrase, then visualise... etc, Montague, 1992) and not assuming that because we have told students about a strategy in one context it will easily be applied to another. This finding was consistent with the review findings of Dent & Koenka (2016) who found metacognitive skills were more highly correlated with academic outcomes than cognitive skills. Berkeley et al. (2011) showed that the metacognitive element is more than just about clear instruction by comparing the intervention group (reading comprehension strategy, RCS) on its own with RCS+AR (attribution retraining). When AR was added, that aimed to identify and reframe negative beliefs about self-efficacy the maintenance effects of the programme showed a large effect size in comparison to RCS alone ($d = 1.21$ compared to $d = .71$) which hints at the need to address affective elements of pupil's sense of themselves (motivation) as learners to maximise the effectiveness of interventions on academic outcomes.

2.3.9 Fidelity of treatment

The review demonstrates that the intervention has been shown to be effective, with large and medium effect sizes (Table 2.6) when delivered by both researchers and when trained and delivered by teaching staff. By comparing across research papers for this review it consolidates the view that it is possible to deliver self-regulated learning across a range of methodologies and specific versions of focus with good fidelity, or we would anticipate an improved outcome for researcher delivered interventions. The Büyüknarci and Grünke (2019) study also showed that, for three out of the four students trained, peer mentors were also effective at delivering the intervention to improve outcomes. Fidelity checks were in place across seven of the reviewed studies with only four studies not explicitly describing fidelity measures (WoE A checklists Appendix E and Appendix G). Of the four studies (Gomaa, 2016; Lizarraga, & Iriarte, 2001; Weisberg & Balajthy, 1990; Montague, 1992) that did not report fidelity measures, three of those were researcher delivered interventions, with only Gomaa (2016) not assessing the fidelity of teacher-led interventions.

2.4 Conclusions and Recommendations

2.4.1 Conclusions

In secondary cohorts where students are participating in a range of studying experiences with many different teachers and across different curriculum areas it becomes more important for each subject to determine what works and how best to deliver key skills. This review has considered a range of studies adapting self-regulated learning strategies to various subject and skill-specific areas

(comprehension, writing, science processes and mathematical concepts including equations and fractions). The eleven studies reviewed showed medium to high effect sizes when using self-regulated learning strategies that include cognition and metacognition to improve academic outcomes for students with learning disabilities.

Previous reviews have found that large effect sizes were associated with interventions focused on mathematics (Dignath & Büttner, 2008) and interventions delivered by researchers rather than teachers (Dignath & Büttner, 2008; Elhusseini et al., 2022). In this review large effect sizes were found for both reading comprehension (Berkeley, Marshak et al., 2011; Firat, 2019; Weisberg & Balajthy, 1990) and mathematical concepts interventions (Cuenca-Carlino et al., 2016; Montague, 1992) when metacognitive instruction given before cognitive instruction). Large effect sizes were also noted in studies regardless of who led the intervention, for example researchers (Firat, 2019; Hoover et al., 2012; Montague, 1992; Weisberg & Balajthy, 1990), teachers (Berkeley, Marshak et al., 2019; Cuenca-Carlino et al., 2019; Gomaa, 2016) or peer tutors (Büyüknarci & Grünke, 2019). This is a pertinent finding from this review specifically.

The Cuenca-Carlino et al. (2019) paper was appraised as the highest quality study of the eleven studies identified and demonstrated a large effect size targeting those struggling with maths problem solving skills using self-regulated strategy development (SRSD) instruction. This finding was further supported by a medium rated paper, Montague (1992), which also focused on maths word problem solving and demonstrated a larger effect size when the metacognitive instruction preceded

the cognitive element of instruction, an interesting nuance. This may reflect the need to have the schema in place of how to use the metacognitive strategies prior to then receiving the explanation of how the strategies work. Other areas that self-regulated learning instruction has been shown to be beneficial in medium appraised studies are the areas of reading comprehension (Berkeley et al., 2011; Berkeley, Marshak et al., 2011; Firat, 2019), science skills (Gomaa, 2016), written tasks (Hoover et al., 2012) and general cognitive skills (Lizarraga & Iriarte, 2001). These findings are congruent with previous reviews (Muijs & Bokhove, 2020).

Training students to use key skills and develop independence in learning can help maximise student's ability to succeed, though a reflection is that it requires time spent away from delivering content, which may or may not be attractive to teachers. It may be that the effectiveness of self-regulated and metacognitive strategies instruction is particularly relevant to learners who may have experienced repeated failure to pick out key advice using trial and error approaches to discern what is most effective in a busy classroom environment. This review focuses on research that includes those learners with additional needs and learning disabilities and shows that a focus on developing planning, monitoring and evaluation skills is an effective method of attempting to redress the balance. Additionally, the findings from Berkeley et al. (2011), show that addressing the impact on self-efficacy (attribution retraining intervention) that learners with difficulties have faced benefits the maintenance of improvements beyond the intervention phase. It is interesting to note that whilst motivation and self-efficacy are recognised by researchers as an important part of SRL, research is still very focused on the explicit instruction around

metacognition, with an expectation that the impact on growth mindset will be a natural follow-on, rather than explicitly including growth mindset approaches in the intervention programmes (for example, Lisarraga & Iriarte, 2001). Future frameworks for practice may need to emphasise the need for a holistic approach and highlight that use of metacognitive strategies by teachers, in isolation from the thought processes brought to the task by students, are less effective.

2.4.2 Recommendations

From a research perspective:

For the benefit of future reviews, it would be helpful for researchers to clearly describe and define the populations of students that are being studied and those of the people that are delivering the interventions to provide helpful information to the reader that can be used to make assessments of how practical or relevant an intervention is beyond the effectiveness of an intervention's outcomes. There is evidence of difference in outcomes in heterogeneous groups, for example, McClain et al. (2021) highlighted that race and ethnicity differences did exist in their meta-analysis of reading comprehension interventions for students with an autism diagnosis, though they acknowledge low power in their calculations. Elhusseini et al. (2022) also highlighted larger effect sizes for studies where 70% of the participants identified as white compared to when 70% of the sample identified as Black, but caution that racial characteristics are not consistently reported, limiting conclusions that can be made.

A recommendation is that future researchers use coding protocols such as those used here (Gersten et al., 2005; Horner et al., 2005) when planning research so that readers can make assessments based on applicability of research findings to their context and their student profiles. As discussed by Cook et al. (2009) whether evidence-based practice can be determined by research carried out without control groups and random allocation of participants is an ongoing issue of contention (Donker et al., 2014) which speaks to the dominance of positivist approaches in research. A recent review of self-regulated learning across primary and secondary using only group outcomes found that where special educational needs categories were given and included outcomes showed medium rather than high effect sizes (Elhusseini et al., 2022). Single case experimental designs (SCEDs) capture details around impact and can be utilised within mainstream settings as well as special educational settings. SCED's can highlight helpful practice-based evidence for a range of educational practitioners and provide helpful detail of individual differences when working with students with additional needs.

From a school perspective

This review shows that the adaptation of subject-specific learning skills into a taught programme that includes clearly explained and structured processes for students to follow through modelling and try out with supervision and feedback will benefit a range of learners from any mainstream classroom, including those with additional needs. Whilst several of those reviewed do use individual and small group instruction the processes are adaptable and can also be seen as effective in whole

class instruction (for example Berkeley, Marshak et al., 2011; Cuenca-Carlino et al., 2016; Hacker et al., 2019) and should be considered by classroom teachers.

However, use of self-regulated strategy instruction also can be recommended as a method or framework to support secondary pupils working with teaching assistants, as writing strategies using Self-Regulated Strategy Development (SRSD, Hacker et al., 2019) including for example, POW-TREE (Hoover et al., 2012) contain formats that could be manualised for supporting staff. Spending time explaining the theory behind effective strategies would support students with learning disabilities, who might otherwise make poor study choices (Bingham et al., 2021) and are known not to benefit through selecting their own preferred methods from a large range of options (Cook et al., 2008). Manualised and scripted strategies would also address the concerns raised that those students with identified needs can spend too little time with the teacher in a context where support staff may not have the skills to offer specific support with learning strategies (Webster & Blatchford, 2013).

The six steps of SRSD that can be adapted and made use of across different subject areas and types of task are as follows:

1. Develop background knowledge
2. Discuss the strategy (for .e.g. POW-TREE for writing)
3. Model it
4. Memorise it
5. Support the student
6. Independent practice.

These steps are echoed in 'The seven-step model' of metacognition published as part of the Education Endowment Foundation review (Muijs & Bokhove, 2020) which includes an additional 'structured reflection' step.

From an educational psychology perspective

Educational psychologists (EPs) are well placed to provide support and advice through consultation and delivery of in-service training (INSET) regarding self-regulated strategies instruction. Benefits to the students of developing self-regulated learning strategies (Quigley et al., 2018), particularly in key stage four, have the potential for longer-term impact as those students prepare for and make use of study skills in their year 11 exams and beyond the classroom. EPs can advocate on developing strategy instruction with teachers to benefit students with learning disabilities as part of whole-class instruction that may increase classroom inclusion that was highlighted as a problem for children with SEN, who are often removed for support (Webster & Blatchford, 2013). Additionally, having knowledge of different elements of SRL strategies can help during the information gathering process of individual case work to help EPs identify what might not currently be in place for a learner to feel a sense of self-efficacy.

As use of SRL strategies by teachers has been linked to beliefs about how effective those practices are, which can be based on their learning experiences (Karlen et al., 2020) it would be helpful for EPs to ensure elements of SRL and effective instruction are promoted and modelled when delivering CPD and training in school contexts.

This maps on to models of adult learning principles that acknowledge use of learning topics in real-life scenarios as beneficial (Dunst & Trivette, 2006).

EPs are also well placed to help identify students who have difficulty with executive functioning skills; the skills that underpin strategy selection and organisation (metacognition). Supporting school staff to develop effective learning strategies with those who have had less success in the classroom directly addresses the need to create a clear link between effort and growth that aids motivational processes (Meltzer, 2018).

Interventions that focus on motivation demonstrate average mean effect sizes $d = 0.49$ (Lazowski & Hulleman, 2016) on young people's educational outcomes. EPs can also contribute by supporting teachers to consider motivational levels of students as well as their cognitions. Adapting the delivery of content in secondary subject specialisms to clearly address the value (why do I need to learn this?) and expectancy (do I believe I can do this?) components of students thinking may help to address the overlooked elements of motivation that are suggested as key elements of fully self-regulated learners (Konrad, 2015; Pintrich et al., 1993). The Motivated Strategies for Learning Questionnaire (MSLQ, Pintrich & Groot, 1990) could be a helpful tool for both EPs and teachers to unpick the barriers to learning that some students face.

2.4.3 Limitations and areas for future research

Limitations to this review include that so many self-regulated learning strategies and meta-cognitive strategies have been born out of the research in this area and given alternative names that it is unrealistic to assume that all the relevant studies have been included here where new names for interventions have been used. For example, SRSD (self-regulated strategy development) was not used as a search term, though it's six stage process is an example of self-regulated learning strategy. POW-TREE (POW =Pick my idea, organise my notes, write and say more, TREE = Topic sentence, reasons, explain and ending) and TWA (thinking before reading, while reading and after reading) are also acronyms developed out of self-regulated learning and SRSD to address specific skills students need, demonstrating the variety of off shoots that SRL has inspired (Gillespie Rouse & Kiuahara, 2017).

Additionally, where studies described students with additional needs as having 'behaviour disorders or 'emotional disorders' these studies were not included in the search due to this review's focus on academic outcomes, however it is acknowledged that these are semantic differences in some cases and may have increased the pool of studies considered if broader search terms and criteria had been included.

Despite the importance of motivation levels for academic outcomes mentioned earlier (Lazowski & Hulleman, 2016) the three elements associated with motivational elements of learning by Pintrich et al. (1993), value, expectancy and affect appear

under-represented elements of consideration in the overall three part structure of SRL used for the purposes of this review.

In order to enable generalisation of findings to a range of contexts it would be helpful if research in mainstream schools reported data on all relevant participant characteristics (as seen in Table 2.5, Berkeley, Marshak et al., 2011). This would enable the impact of learning interventions on all types of learners to be extracted from mainstream data, whilst acknowledging that access to special characteristic data (gender, ethnicity and special educational needs status) can be hard to access when researching school populations. For example, Azevado et al. (2022) highlight that low social economic status creates a cycle of disadvantage related to cognitive and social skills which a focus on SRL strategies in school can help to address.

A further limitation regarding this review is that the education systems in different countries can differ to an extent that may inhibit the generalisability of the research to a UK context. In particular the special educational needs provisions across the globe vary in their attitudes towards young people with learning disabilities that may impact on how they are treated, which would cause ethical concern. Whilst this review has intentionally focused on positivist perspectives regarding how effective the interventions are, using pre and post data, it is not the view of this author that interventions are carried out 'on' the student but rather 'with' the student as a collaborative learning experience. The extent to whether this was the actuality in practice in each of the individual studies is not clear, but it is considered appropriate

by the author that the learner would be encouraged and supported to engage within approaches in a facilitative manner.

Further research is needed on how easy it is for teachers to incorporate self-regulated learning strategies into their curriculum delivery. This review found only one study (Berkeley et al., 2011) reported attrition rates which are useful to identify if interventions are hard to maintain over time in busy classroom contexts. Exploring teachers' perspectives of how the process of SRL aligns with curriculum delivery would provide insight into how to increase the use of strategies which, this review shows, are often of significant benefit to those who find learning challenging.

2.5 References

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Chapter 3: Empirical paper

Title

“I used to spoon feed them”

**Exploring secondary teachers’ reflections on self-regulated learning
workshops**

A multiple case study design.

3.1 Abstract

This multiple case study explores the experiences of secondary teachers as they considered the application of self-regulated learning principles (including theory around cognition, metacognition and motivation in the classroom context) to their course delivery. Using three different school settings (two secondary comprehensives, one with low and one with high pupil premium numbers and one alternate provision), two workshops were delivered on self-Regulated Learning (SRL; cognition, metacognition and motivation) and used pre and post questionnaires with focus groups to capture what teachers' experiences were of focusing on SRL in their lessons over one term. Changes in teacher attitudes towards self-regulated learning and their sense of self-efficacy showed improvements post workshops (using the reliable change index). Five teachers showed an improvement in post workshop attitudes towards self-regulated learning, and three had reductions. Teachers' sense of self-efficacy, improved in all but one of the seven teachers completing pre and post measures, with one teacher showing improvement in total self-efficacy and subscales of efficacy in student engagement, in total three teachers showed significant improvements for efficacy in classroom strategies. A reflexive thematic analysis from post-workshop interviews and focus groups identified three overarching themes of 'Identifying with principles of SRL', 'Needs of students met by SRL' and 'Systemic issues creates need for change in teaching methods'. Teachers noticed increased levels of independence across students, including those with additional needs when tasks were adapted using smaller tasks and scaffolding (cognition) and students were provided with frameworks to monitor, review or check their progress

(metacognition). Teachers across schools identified with the principles of SRL in their specialist teaching areas. A reported systemic barrier was delivering courses that were not aligned to students perceived view of real life applicability; it is suggested that a focus on lifelong learning skills using SRL principles can to some extent address this issue.

3.2 Introduction

3.2.1 Self-regulated learning and instructional psychology

Cognitive science and instructional psychology take information about how the brain appears to process information (cognitive science) and evidence about what creates the best learning outcomes (instructional psychology) to provide advice and direction for educators to develop effective teaching. For example, Rosenshine (2012) identified that there were ten key principles that distilled good practice and positive outcomes (Figure 3.1). Such advice includes modelling clearly before asking students to complete a task, chunking content into smaller pockets of learning to manage cognitive load alongside time for rehearsal and explicitly linking to previous knowledge.

Figure 3. 1 *Rosenshine's Principles of Instruction (2012)*

Principles of instruction
• Begin a lesson with a short review of previous learning. • Present new material in small steps with student practice after each step. • Ask a large number of questions and check the responses of all students. • Provide models. • Guide student practice. • Check for student understanding. • Obtain a high success rate. • Provide scaffolds for difficult tasks. • Require and monitor independent practice. • Engage students in weekly and monthly reviews.

Evidence on instructional practice is based on attainment outcomes, however, it is also relevant to consider how adults present the concept of knowledge building. If

increased knowledge and understanding is framed in the context of experience and practice-based effort it matches with growth mindset (Dweck & Leggett, 1988) which is an inclusive approach to teaching in that everyone can make progress on appropriate and motivating targets. Alongside effective instructional practice it is, therefore, also important that teachers embody the belief that positive outcomes are linked to effort and are not focused wholly on results, which is challenging to achieve when teachers are judged on academic outcomes. A risk factor for this approach is during whole-class prescribed learning when a student gets 'stuck' even with effort, it is commonly assigned to a within-child issue rather being used as an exploration of what adaptations are needed for a range of learners. The normal distribution process for allocating grades means that not all learners can achieve above average results and our duty in education is to own that fact and promote positive learner outcomes for all, not just those whose grades fall into the top half of the process.

To this end instructional psychology suggests that identifying key components that are needed to succeed and focusing on securing those key elements will have a greater impact on all students than teaching more broadly and removing those students who struggle for additional support (Solity, 2020; Ward et al., 2017). Due to the multiple-construct nature of instructional psychology approaches it is complex to develop, for example, with teachers having to promote thinking about task difficulty, self-efficacy and the evaluation of approaches used to name a few elements (MacMahon et al., 2022). Solity (2017) suggested that educational psychologist's role in supporting teachers understanding of how learning happens would have a wider impact than the current over-focus on individual assessment work.

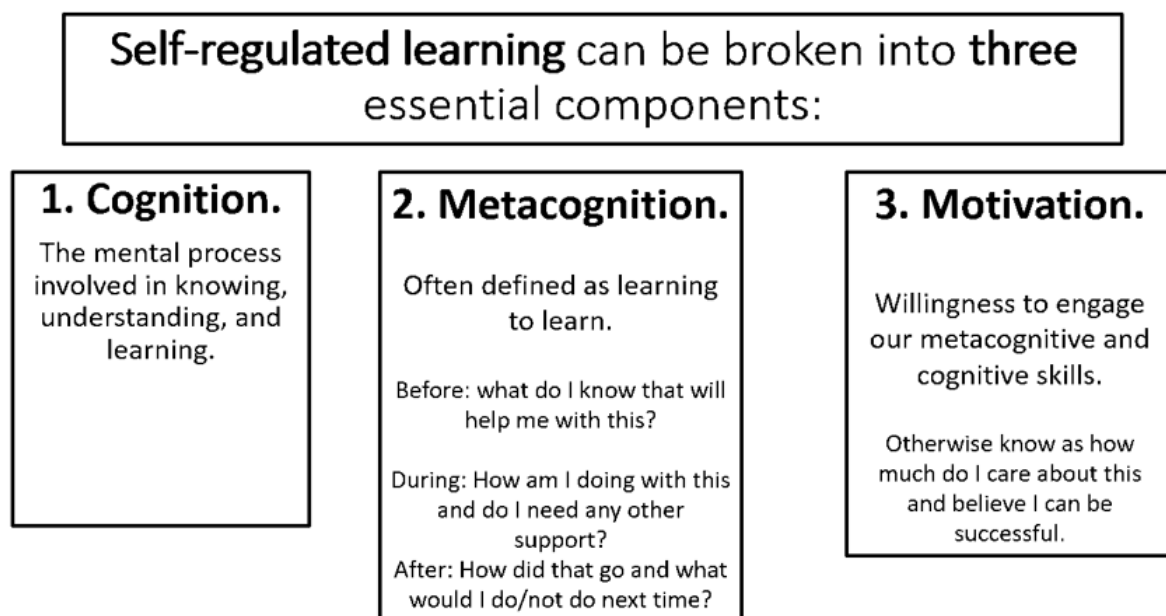
The classroom level impact has been identified as explaining more variance in student outcomes than school-level, with the instructional and relational elements of teaching behaviours (Kyriakides et al., 2013) being highlighted as key. In their 167 study meta-analysis Kyriakides et al. (2013) found that their dynamic model of instruction that includes features of effective instruction highlighted by Rosenshine (2012) and Hattie (2012) was supported, suggesting a focus on different teaching approaches rather than underpinning instructional practice was unlikely to be helpful.

Meta-cognitive (MC) and self-regulated learning strategies (SRL) have been terms discussed in educational psychology since the 1980's (Dent & Koenka, 2016; Zimmerman, 2008) and are examples of instructional psychology that have been effective at supporting learners; by increasing awareness of how learning happens, improving teaching skills and leading to improved outcomes for learners (Hasselhorn & Labuhn, 2011) thus improving teacher efficacy. Dinsmore et al. (2008) reflect on the origins of metacognition and self-regulation as crossing several theoretical domains (developmental psychology and social cognition), which may explain its' effectiveness at addressing a variety of factors within the classroom context.

The two-factor definition of metacognition (MC) states that MC is knowledge of cognition and regulation of cognition (Harrison & Vallin, 2018). Student performance could be improved by teacher intervention but led to the question of how to ensure students embed practice when working independently (Zimmerman, 2008). A key element in learning is motivation to learn, which is addressed by combining MC strategies with those of a self-regulated learner. Therefore, a three-part process of

cognition, metacognition and motivation (Figure 3.2, based on Quigley et al., 2019) is helpful; it encourages students to think about what they already know that is similar, what strategies have been successful before, as well as considering individual differences in how this may be implemented due to motivational factors. Here, the term ‘self-regulated learner’ is used as an umbrella term for the processes of: thinking about how you learn; your own learning strategies in use and your ability to reflect on the effectiveness of those strategies after use. There is often a lack of clarity when discussing metacognition and self-regulated learning (Dinsmore et al., 2008) with overlapping terms found in literature searches, so clarity of the three components used here is felt necessary to delineate this researchers’ intended use of terms.

Figure 3. 2 *The EEF Definition of Self-regulated Learning*



By creating a curiosity for *how* students tackle their learning, a focus on self-regulated strategies for the teacher could build self-efficacy in their practice, acting as a resilience factor, whilst providing the tools to adapt their teaching, subtly, for different student's needs. For the pupil the intention is to change the atmosphere in the classroom to one where all are accepted in their current learning state and the teaching process enables them to take responsibility for their learning when they are ready and therefore become self-regulated learners. When teachers report high feelings of responsibility for student outcomes it has been negatively correlated with knowledge and use of SRL practices (Callan et al., 2022). Developing SRL strategies is positioned here as a collaborative process between teacher and students.

Introducing SRL is particularly pertinent to students with additional needs in the classroom, as during the academic year 2019-2020 attainment data for pupils with a registered special educational need (SEN) depicts lower attainment scores at key stage 4 in comparison with their non-SEN peers (Department for Education, 2021a). Academic performance across primary and secondary educational contexts has been shown to correlate highly with both metacognitive and cognitive processes (Dent & Koenka, 2016).

SRL has been described as a 'key construct' for educationalists (Boekaerts & Cascallar, 2006). The Education Endowment Fund (EFF, 2019) describe SRL interventions as a low-cost method with extensive research base, which in the context of school budget cuts is attractive. SRL strategies, including metacognitive

processes, can be implemented across the whole class to benefit all pupils and have been shown to have a particular impact on lower social economic status pupils (de Boer et al., 2018) and on older pupils (Education Endowment Foundation, 2018). The impact of SRL interventions delivered by teachers has shown smaller effect sizes than those led by researchers (Dignath et al., 2008), suggesting further study of delivery through teachers that includes identifying barriers to implementation would help to understand this discrepancy. However, an interesting benefit of making use of an SRL focus in the classroom is that it prompts teachers to take an analytical view of the methods that students are making use of, to unpick maladaptive study techniques. Despite supporting evidence for effectiveness, time spent addressing SRL in everyday classes has been described as limited (Karlen et al., 2020).

Cognition.

Cognition is defined as the mental processes involved in knowing understanding and learning. If students equate 'learning' (use and application of information at a future point) with 'understanding' (the experience that content makes sense) they may choose not to put effort into 'learning' once understanding has been experienced. Helping students to navigate the difference can lead them to evaluate what they 'know' and assign effort into their learning more efficiently (the final part of this process overlaps with metacognition).

An estimated 1 in 10 children have working memory difficulties (Alloway & Carpenter, 2020) therefore, having knowledge of working memory (Baddeley & Hitch, 1974) and how to support students to make use of this knowledge when developing study skills is important. Explanations of working memory limitations (Magic number seven, Miller, 1956) and introducing the concept of cognitive load (Sweller, 1988) provides rationale for students use of revision techniques; that chunking (reducing load) underpins the effectiveness of mnemonics, for example. It also helpfully highlights, for instructional purposes, that making links to similar known information supports transfer of information to long term storage (Germane cognitive load, Sweller et al., 2019). Schema theory (Bartlett, 1932) highlights the need to have a framework to build understanding that supports memory processes and the effectiveness of activating related knowledge (bringing it to awareness) in the classroom context.

Metacognition.

Metacognitive processes echo the 'plan, do, review' ethos of the SEN code of practice (DfE & DoH, 2014) as it includes any tasks that include student involvement with planning how to complete a task, monitoring progress during a task and evaluating how well the task has met the aims. Models of metacognition can overlap with cognitive elements (Zepeda et al., 2019) and the distinction made here is for ease of use rather than to depict each of the three components as theoretically isolated. Whilst few SRL approaches are reported to be used by teachers (Callan et al., 2022) it is expected that teachers will recognise some metacognitive processes

(Figure 3.2) in classroom practice even if they may not use the term. Use of scaffolded writing prompts are common planning tools in secondary classrooms, teachers do report using self-evaluation, modelling and SRL worksheets (Callan et al., 2022). Understanding why these processes support learning (cognition) and being motivated to use them due to confidence they will effectively support the learner (motivation) to work together to build a self-regulated learner approach.

Motivation.

In earlier models of self-regulation motivational elements are embedded within other phases, for example the 'forethought phase' including self-motivation when students chose an area to study that they are inherently interested in, described by Zimmerman (2002). Students can identify improvements in their work by self-reviewing against planned tasks, which will lead to increased self-efficacy and build motivation. Motivation as a standalone sub-component enables supporting adults to highlight and promote study skills that are most likely to lead to self-efficacy, rather than waiting for students own reflections, which may only benefit certain learners and in certain learning situations.

By taking on board the student's perspective (for e.g. social status is more important than teacher demands) teachers can tap into the 'motivation' element of SRL and suggest strategies that meet students' needs (Boekaerts & Cascallar, 2006), such as recognising whole-class questioning may not be an accurate assessment tool for some students who will not participate publicly in feeding back. This resonated with

the researcher's previous experience as a secondary teacher when responding to 'I don't have an hour every night to revise' with 'have you got ten minutes?' prompted a change over time in one young person's engagement with study advice once they perceived it to be a two-way conversation about what will work, rather than a diktat. Interventions with metacognitive and motivational elements have demonstrated higher impact with secondary aged students (Dignath et al., 2008). Research focusing on student engagement (inter-linked with the concept of motivation) highlights that the classroom context is an important element in facilitating engagement (Putwain et al., 2016). Additionally, Weiner's theory of attribution highlights the importance of both student and teacher perceptions of 'effort' and 'ability' on levels of motivation in the classroom (Weiner, 1972).

Whilst programmes that aim to improve self-regulated learning through re-structuring students' beliefs have been shown to improve grades, understanding about student engagement comes from cohorts of students who are within the mainstream system rather than those disengaged from it (Putwain et al., 2016). Factor analysis identified teacher-student relationships as one of six elements when developing an engagement measure alongside control, peer support, future aspirations, family support and extrinsic motivation; suggesting 'how' learning is presented in the classroom is an important factor in students' decisions to participate (Appleton et al., 2006). Broader understanding of motivational barriers to learning will come from educational research that is inclusive of a wide range of learner contexts.

SRL interventions promote a range of strategies including, using lesson starters to review associated prior learning, building awareness of cognitive processes such as reducing cognitive load, having processes modelled before independent practice and using checklists to monitor and self-evaluate. Previous research using SRL interventions has considered the usefulness of domain-general (study skills sessions) and domain-specific (focused within specific subject areas) interventions and domain-specific have been the most successful (Hattie et al., 1996; Quigley et al., 2019). Domain-specific interventions benefit from developing teacher efficacy at supporting study skills as well as delivering content, presumably benefitting both current and future students. The expectation for students to take generic SRL strategic information and adapt across a range of subject areas that can, at key stage four, vary from subjects containing skill-based subjects and theory requirements, has not been as successful (Muijs & Bokhove, 2020). This could potentially be explained by teacher attitudes to self-regulated learning, with teachers needing to value the use of SRL in their subject areas in order to maximise student's ability to use those skills, once taught in class (Steinbach & Stoeger, 2016). Despite information available regarding the effectiveness of developing SRL strategies, Callan et al. (2022) suggest few teachers are using it and question how much we know about characteristics of teachers who do versus those who do not.

One approach to applying SRL to writing skills that has received research attention in the United States for supporting learners with learning disabilities and/or emotional and behavioural problems, is the process labelled Self-Regulated Strategy Development (SRSD, Harris & Graham, 1992; Harris et al., 2003) and has since

been adapted for use with other skills, for e.g. Maths (Cuenca-Carlino et al., 2016; Hacker et al., 2019) and reading (Firat & Ergul, 2019). SRSD includes six stages of developing background knowledge, discussing the strategy, modelling the strategy, memorising the steps, supporting student use of strategy and finally independent use of the strategy. Harris et al. (2003) highlight that SRSD approaches can be criticised for being focused on direct instruction methods as opposed to constructivist approaches where learners construct knowledge through appropriate social contexts, though they argued constructivist approaches are the least effective for learners with additional needs. However, an alternative perspective is that SRL approaches are aligned with constructivist views of learning (promoting students as active participants in the learning process) and is the view taken in this thesis. Direct instruction involves more passive student training (Steinbach & Stoeger, 2016) and has been associated with reduced opportunities for SRL strategies (Zimmerman, 1989).

3.2.2 How is this approach appropriate for 14-16-year-old cohort?

During adolescence, young people are more likely to respond to instructional advice when they believe that the trait being worked on has potential for change rather than being fixed (Yeager et al., 2018): this is an incremental theory of personality versus entity theory of personality. Motivational elements of self-regulated learning therefore, should include clear explanations to students about how study techniques work and highlight that lack of progress can be better explained by inappropriate study skills rather than fixed intelligence (Dweck & Leggett, 1988).

Developmentally relevant factors are an important part of implementing interventions with upper secondary school cohorts. During adolescence individuals prefer to have their status acknowledged as unique, with ownership over decision making; this is recognised as a factor that has reduced the effectiveness of generalising previously successful primary and early secondary interventions (Yeager et al., 2018). During adolescence students are sensitive to disrespect, which causes unpleasant emotional responses like shame and embarrassment and is linked to hormonal, social and social-cognition explanations specific to adolescence (Yeager et al., 2018). In contrast, respectful interactions produce pride and positive emotional responses that are argued to be motivationally salient (Yeager et al., 2018). Shame can be experienced in the classroom when students have been labelled with the ability and then fail to perform (Weiner, 1972). During adolescence, when protecting social standing becomes a priority, it is easy to understand why for some students 'not trying' can feel emotionally safer than risking effort for unknown outcomes.

It is suggested here that it is therefore prudent for the teacher to position themselves as an 'advisor'. Modelling self-regulated learning techniques and explaining the theory underpinning techniques demonstrates respect for student autonomy in their study skills and allows students to engage in feedback on the process, that is not available to the teacher using a directive approach. Non-use of strategies by students can provide helpful perspectives, using curiosity to re-frame non-compliance as 'useful evaluation'. When interventions are delivered to students using directive approaches it is less likely that student views will feel sought or respected.

Self-regulated learning principles are also beneficial from a developmental perspective as brain development in mid-adolescence implicates improved cognitive control (the development of the frontal lobe associated with adolescence) that would suggest planning and evaluating work is more suited to this stage of education than earlier phases (Dumontheil, 2016; Roebbers & Feurer, 2015). Additionally, the increased cognitive demands of the secondary curriculum also explain why SRL is an appropriate tool to embed with older students (Dent & Koenka, 2016).

Finally, contextual issues within our current education system may make the explicit use of SRL techniques increasingly more beneficial to secondary students as they prepare to leave school. Sweller et al. (2019) highlighted that previously, if students were only exposed to well-designed instructional methods, cognitive overload would have been unlikely to happen, therefore making it unlikely students needed teaching about it. However, with online learning and student access to the wealth of internet resources, knowledge about managing their own learning becomes paramount to navigate the information rich environment. With the competing interests from social media and the online world in general it may be more pertinent currently to support students in how to review their learning goals and plan realistic next steps (Zimmerman, 2002). Additionally, highly structured learning environments may stifle the ability of students to display SRL behaviours such as planning and self-review which teachers would therefore need to be aware of (Zimmerman, 1989).

3.2.3 Developing professional capacity of teachers.

New teachers joining the profession are expected to make use of this evidence-based practice as it is included in the initial teacher training framework (Department for Education, 2019a) with references to cognitive load theory, metacognition (planning, monitoring and evaluating) and awareness of motivating young learners. There is an expectation that teachers understand how pupils learn and factors that inhibit learning in the teaching standards, similarly it is considered that teachers can reflect on differences in abilities and disabilities to adapt their practice (DFE, 2021a). Teachers attitudes to making use of SRL needs to be positive for teachers to prioritise the use of the strategies with their students (Steinbach & Stoeger, 2016).

Schools face a dual challenge of having their budgets cut from 2010/2011 to 2020 (Institute of Fiscal Studies, 2020) and poor staff retention (DFE, 2019b; Worth et al., 2018) which can impact on the quality of teaching delivered in the classroom. If teachers do not stay in teaching long enough to build up expertise this impacts classroom practice, whilst more experienced teachers leaving removes experienced role models from the departments of early career teachers. This process can disproportionately impact on pupils with special educational needs, who benefit from trialling a range of strategies to develop as effective learners. The SEN code of practice (2014) states that quality first teaching should be in place for those young people with additional needs, before other resources are used to support them. Developing the individual expertise of teachers is also a pragmatic decision to

improve outcomes in secondary schools which is supported by John Hattie who acknowledges that,

“the greatest source of variance in our system relates to teachers...what does matter is teachers having a mind frame in which they see it as their role to evaluate their effect on learning” (Hattie, 2012, p.15).

Learner-centred teacher-student relationships are effective (Cornelius-White, 2007) as they promote the collaborative working relationship between the teacher and student; self-regulated learning principles promote this approach. This may also benefit neurodiversity in student populations as some students struggle with directive teaching approaches, therefore, self-initiated and reflective classrooms may address this resistance.

Social cognition theory (Bandura, 1979) suggests self-efficacy as a key element to implementing behaviours and this can be applied to teacher’s assessment of whether they can effectively teach a range of needs. Interestingly, Karlen et al. (2020) suggest that there may be an interplay between teacher’s ability to make use of SRL themselves and the likelihood of them using it with their own classes. Self-efficacy also applies to students’ assessment of their ability to learn and seeing effective strategies for learning being modelled by their teachers is vital, to build their self-efficacy as learners. It is helpful to reflect on the usefulness of the theoretical underpinnings for both the student and teacher, if we take effective learning principles and model them during staff CPD (continuing professional development)

and line management those experiences will encourage and embed concepts for future use.

If teachers do have low self-efficacy due to lack of specialist training around their ability to meet the needs of a diverse range of learners this can impact their wellbeing. Teacher self-efficacy is supported by research as being fundamental to teacher wellbeing and student outcomes (Strahan nee Brown, et al., 2019; Zee & Koomen, 2016). Wellbeing is also a potential factor in high staff turnover in schools, where only 15% of those leaving the profession do so due to retirement (DFE, 2019b), with larger reports of stress in the teaching workforce compared to the general population (Education Support Partnership, 2018). Understanding what builds and protects the self-efficacy of teachers could bring gains for teacher wellbeing at a time of high pressures in the education system since Covid-19 lockdowns; teacher retention is in the best interests of all pupils.

With such a wealth of information relevant to teaching from neuroscience, cognitive psychology and education, MacMahon et al. (2022) suggested having your professional focus split between research and teaching was a factor in higher education (HE) for a reduced focus on implementation of evidence-based practice. Despite the considerable body of evidence building on SRL reported use of approaches can be low (Callan et al., 2022). An interesting question for the secondary context is can teachers prioritise developing their teaching practice whilst administrative workload and content delivery increase?

3.2.4 Implementation science and adult learning models

Dewey and Bento (2009) highlighted that there are three main approaches to embedding thinking skills in student populations, bolt-on additional lessons, subject-focused interventions and infusion methods where teachers are promoting metacognitive approaches for students to embed across the curriculum. Where study skills have been taught as standalone skills that students can pick up and make use of across their classes, the evidence that this is effective for secondary school students has not been supported by meta-analysis reviews (Hattie et al., 1996). Study skills generically and self-regulated learning strategies in particular have not been effectively generalised when students have been given an isolated set of skills-training sessions and expected to use them across contexts and curriculum areas (Hattie et al., 1996; Quigley et al., 2019). Effective use of these strategies has been seen when teachers embed them into their own practice and relate them to their own subject specialism (Quigley et al., 2019). Barriers to teacher implementation of strategies that are evidence-based (aside from workload demands mentioned earlier) include differences in researcher and practicing teacher's world views, that can lead to perceived philosophical differences that polarise opinions (MacMahon et al., 2022). Teachers need to feel that the evidence being presented is relevant to a 'problem' in the classroom that they are trying to solve. A suggestion for how to address this is to make use of 'knowledge brokers' who act as intermediaries between the research and teaching communities and have knowledge of both (MacMahon et al., 2022). This approach would also help to address the related barrier to implementation, where strategies that are effective in research

contexts are 'watered down' when moved into the classroom context (Sherrington & Caviglioli, 2021). However, ultimately if 'effective' teaching strategies assessed outside of the learning context repeatedly don't replicate into improved outcomes for pupils in the classroom then the method being promoted may not be fit for purpose. Feedback of this kind from teachers is vital to refine and develop realistic teaching practice that can be implemented and used consistently in schools.

Educational psychologists (EPs) are ideally placed as knowledge-brokers, as doctorate training includes delivery of in-service training to schools and as an applied course the content bridges research and practice.

Previous research has shown that external professionals delivering SRL strategies directly to students can be effective and slightly more so than teachers (Dignath et al., 2008; Elhusseini et al., 2022) when assessing the short term use of the strategies and measuring academic outcomes. Potential explanations for this difference can be hypothesised, however, gathering teachers' experiential evidence provides a basis for adapting how SRL is presented to teachers, with a view to increase uptake of SRL by more accurately reflecting the complex systemic context that practice needs to be embedded within (MacMahon et al., 2022). Implementation science critiques interventions that are delivered by experts in situations that are atypical to where the skills are usually seen as this prevents assessment of effectiveness in real world scenarios, like schools (Kelly, 2012). Much of the information gathered on effective teaching practice refers to a limited range of subject areas at secondary and building up a picture of teacher perspectives across

a range of subject specialism has been suggested as a helpful area for development (Kyriakides et al., 2013). Training is likely to be more effective with more than one contact time with teachers to give reflection time and practice with embedding strategies (Dunst & Trivette, 2006; MacMahon et al., 2022).

3.2.5 Rationale for study

This research is, therefore, a multiple case study design aimed to develop an understanding of how teachers in different secondary settings, with a range of subject specialisms, were able to engage with and make use of self-regulated learning strategies; how teachers make use of or intend to make use of the strategies across a range of subject specialisms as previous research in this area has focused specifically on the implementation and outcome measurements of interventions in core subjects (Radford et al., 2014; Zepeda et al., 2019).

Two workshops highlighting the three key elements of self-regulated learning (cognition, metacognition and motivation) were designed and delivered for the purpose of this thesis (Table 3.1), with the researcher taking the role of 'knowledge broker' (MacMahon et al., 2022). Teachers took part in training and cross-subject discussions about self-regulated learning and were encouraged to plan the use of techniques that fitted well into their curriculum area. This ensured their evaluation of usefulness of SRL to their classroom took place in an ecologically valid context (Table 3.1). Teacher's views regarding the enablers and barriers of successful implementation will lead to increased feasibility of implementing across other similar school contexts. This approach aims to incorporate elements of implementation

science and successful implement practice with the 'infusion' style of delivery that encourages staff to share ideas across curriculum areas (Dewey & Bento, 2009).

Table 3. 1 *A Summary of Self-regulated Learning Principles Linked to Classroom Practice.*

Element of self-regulated learning.	Theory/process discussed.	Link to classroom practice
Cognition: the mental processes involved in knowing, understanding and learning. Workshop 1. Theory/process.	- Defining Learning- ability to apply knowledge over time. - Cognitive load theory (Sweller et al., 2019) limit to amount of new content that can be processed (Miller, 1956). - Promoting and embodying growth mindset principles—successful learners put in effort over time. - Efficient learning is promoted - developing frameworks to build knowledge (Schema theory).	- Effort and repetition (e.g. planning learning cycles that include; homework and retrieval practice). - Revisiting core components of course - Chunking and use of mnemonics. - Supporting students to reframe poor outcomes with realistic appraisal of current effort and participation in the learning process. - Pre-teaching key terminology, graphic organisers, lesson starters that review linked knowledge. Identifying and addressing gaps in knowledge.
Metacognition: 'learning to learn' including planning, monitoring and evaluation of work.	Planning: what do I need to do? how long will it take? what do I know that I can use here? Monitoring: How am I doing? Do I need help? Have I met any criteria? Am I still focused on task? Evaluation: What have I done well? What can I change for	- Scaffolding frequently used processes (for e.g. long answer exam questions) and link to cognitive (mnemonics to reduce cognitive load). Model and demonstrate processes. - Provide prompts linked to scaffolding (for e.g. 'what, how why') during assessments for learners who have at early stage of skill acquisition (linked to motivation – Vygotsky: do not remove support until skill acquired).

Element of self-regulated learning.	Theory/process discussed.	Link to classroom practice
Workshop 1.	next time? What do I know now that will help next time? What other help to I need to improve? • Little and often approach shows that small, measurable, achievable, realistic and time-related targets (SMART) are effective.	• Criteria checklists to use when monitoring and editing work. • Support reflection on attention span – linked to cognition – how long can I work for before I need a break (self-monitoring). • Peer and self-assessment of work using criteria and examples. Model and support self-evaluation. • Promote individual and specific target setting linked to current experiences rather than longer term goal (e.g. I need to write more than one sentence when evaluating, rather than I need to get a level 6 next time).
Motivation: Willingness to engage our metacognitive and cognitive skills. Workshop 2 (including links with workshop 1 content)	• Weiner's (1972) theory of attribution: expectancy for success/failure determines effort put in. • Dweck's (1988) growth mindset – focus on effort not outcome. • Vygotsky's (1962) zone of proximal development: learners can make progress with right support. • Model regulation in your classroom. • Adolescent development.	• Use of language that reflects that all learners can improve once they have identified the right techniques. • Use language that reflects the belief that improvements are linked to effort. • Promote reflection without providing negative judgement to create environment where students can be honest about what they are not doing – supports identification of maladaptive processes that can be adjusted with realistic alternatives (SMART targets). • Identifying your own 'shark music' and work on not responding emotionally to students lack of motivation: work on developing a curious approach to 'why' rather than a directive approach to 'what' they are doing. Be prepared to apologise and model compromise to promote those qualities in your classroom.

Element of self-regulated learning.	Theory/process discussed.	Link to classroom practice
		• Adolescence as a time for increased independence and autonomy– promote choice where possible across the course, provide time to work independently and systems to ask for help that are discrete and normalised. • Peer influence and social status is more important during adolescence than meeting adult needs and requests – be flexible and avoid ultimatums.

This empirical paper is bringing together anticipated challenges facing secondary school staff (lack of SEN training and developing expertise for teaching disengaged students) and asking if these needs can be met through developing teachers' expertise in instructional psychology, with strategies that focus on how learning occurs.

3.2.6 Research hypotheses and propositions.

The following research hypotheses and propositions were considered by the researcher when designing this research:

- Hypothesis: Teachers sense of self-efficacy will increase when they are given time to reflect on and discuss SRL and time to use with their classes.
- Hypothesis: Teachers attitudes towards self-regulated learning will change following the workshops.
- Proposition: Teachers will be able to describe application and implication to practice of SRL.
- Proposition: Teachers with time to find out about and discuss how to embed self-regulated learning into schemes of learning will find it an appealing tool to use in class to improve outcomes.

3.2.7 Research questions.

The following research questions were developed to assess the hypotheses and propositions formed from the literature review outlined in this section.

Quantitative – using questionnaire data.

RQ1: Does teacher self-reported self-efficacy improve after attending workshops on how to make use of self-regulated learning techniques in the classroom?

RQ2: Does teacher self-reported attitude to self-regulated teaching strategies improve after attending workshops on how to make use of self-regulated learning techniques in the classroom?

Qualitative – collected from focus group responses.

RQ3a: How much and what parts of the self-regulated learning techniques are being used in the lesson by teachers?

RQ3b: How easy do teachers find it to incorporate self-regulated learning strategies into their planning?

3.3 Method.

3.3.1 Design.

A mixed methods multiple case study design, where both quantitative and qualitative data are collected, was used to address the research questions (Table 3.2). A case study was seen as appropriate to answer ‘how’ questions and due to the need to collect information in a context where the researcher cannot manipulate the behaviour of those involved (i.e. by changing course delivery) and to include the contextual information pertinent to classroom teaching (Baxter & Jack, 2008).

Teachers at three educational settings teaching Key Stage Four students (14-16 years old) received two workshops on self-regulated learning, where they were encouraged to discuss how they might make use of the approaches and theories mentioned in their classrooms. The role of teacher attitudes to self-regulated learning has been identified as important to the use of the strategies becoming

automatic (learnt) processes (Boekaerts & Cascallar, 2006). Boekaerts and Cascallar (2006) also point out that there is a burden of cognitive load on the teacher in this process of creating a classroom environment where individuals are developing strategic goals across different elements of the course demands; highlighting the importance of collating teacher perspectives in juggling these demands. An evaluation focused multiple case study design (inspired by Yin, 2014) was used to address the quantitative (teacher attitudinal change pre and post workshops) and qualitative components (teacher perspectives on incorporating SRL) of the research and was chosen to reflect the epistemological stance of the researcher as a subjective interpreter of the participants social constructionist perspectives as teachers. Participants (teachers) were invited into interaction to identify information about the case (Hyett et al., 2014). Focus groups were identified as a useful method to gauge group perspectives and be representative of the 'case', rather than individual perspective that would have been gained using individual interviews (Hollander, 2004).

A multiple case study design was considered appropriate to reflect that whilst each school was a bounded unit within the homogenous process of education, there was potential to reflect the heterogenous nature of secondary schools' populations should that influence perspectives on SRL depending on the cohort being taught (Yin, 2014). Though other tight features of Yin's philosophy around case study research was not adhered to, taking the more flexible approach described by Yazan (2015) as being aligned Robert Stake. As suggested by Hyett et al. (2014) as good practice in

case study research, (COREQ checklist, Appendix B, Tong et al., 2007) outlines details of the case study design and justifies the decisions made.

Table 3. 2 *Research Questions and how they were Addressed.*

Research questions (RQ)	Quantitative phase	Qualitative phase
RQ1: Does teacher self-reported self-efficacy improve after attending workshops on how to make use of self-regulated learning techniques in the classroom?	Pre and post intervention Teachers' sense of efficacy scale (Tschannen-Moran & Hoy, 2001).	Focus group questions 1 and 2: Delivery of session How confident did you feel in being able to deliver the three elements of SRL that we discussed in the workshops (Cognition, metacognition and motivation of learners through language and questions). How confident would you feel in explaining these techniques to another member of staff?
RQ2: Do scores on a teacher attitude to self-regulated teaching strategies	Pre and post intervention Teacher Attitudes Towards Self-regulated Learning Scale (Steinbach & Stoeger, 2016).	Focus group questions: Impact of sessions Did you feel that the focus on self-regulated learning techniques and ideas led to an improvement in your students' academic achievement?

Research questions (RQ)	Quantitative phase	Qualitative phase
scale improve post intervention?		• Did anyone notice an impact on student's confidence in study techniques? • Are there any examples of where a particular student appeared to benefit from a technique you were using? • Are there any examples of where a particular student appeared to not benefit?
RQ3a: How much and what parts of the self-regulated learning techniques are being used in the lesson by teachers?		Qualitative data collection in workshop 2. Focus group. Research question 3a facilitators. Were there elements that you found easier to incorporate into your teaching than others?

Research questions (RQ)	Quantitative phase	Qualitative phase
RQ3b: How easy do teachers find it to incorporate self- regulated learning strategies into their planning?		Qualitative data collection in workshop 2. Focus group. Research question 3b: barriers. Were there any barriers to using these techniques in your subject area and can you explain why it is a barrier?

3.3.2 Theoretical underpinnings to workshop design and planning.

Dunst and Trivette (2009) identified the key elements of adult learning based on analysis of the effect size shown across a range of adult learner contexts. The more characteristics of adult learning included, the more positive outcomes were for the learners, with 2-4 characteristics associated with an average effect size of 0.75 and five characteristics associated with an average effect size of 1.25 (Dunst & Trivette, 2006). The Dunst and Trivette (2006) analysis outcomes are shown below (Table 3.4) against how the training used in this research met those criteria in the views of this researcher. This approach was described as Participatory Adult Learning (PALS) and was used as a basis for the design of the workshops used in this research project.

Effective implementation of research has been described as containing a number of features that have been summarised by MacMahon et al. (2022, Figure 3.3).

Table 3. 3 *Adult Learning Practice Methods that were Significantly Related to Positive Outcomes (Dunst & Trivette, 2006) with Training Design Decisions*

Adult learning practices	How the recommended adult learning practices were addressed in this research.
Introduction of the learning topic: (1) out of-class activities and self-instruction and (2) warm-up exercises and pre-class quizzes.	An information sheet was sent out to participants during the recruitment phase, explaining the definition of self-regulated Learners (Appendix L)
Illustrating the learning topic: 1) instructor use of role-playing or simulations and (2) incorporating learner input into demonstrating the applicability of the new knowledge, material, or practices.	A summary diagram was used to illustrate the key concepts (Appendix M). Real classroom examples were used to illustrate learning points (workshop slides, Appendix A). Teachers participants were asked to apply the concepts to their subject and classroom specific concepts.

Practising the use of the learning topic for example, real life application and role-plays.	Teachers participants were asked to apply the concepts to their subject and classroom specific concepts. Opportunities were given for teachers to apply self-regulated learning techniques directly into their classroom practice and to address areas of difficulty for students learning.
Evaluating the consequences of application: (1) assessing learner strengths and weaknesses related to the application experience and (2) reviewing learner solutions to problems or answers to quizzes about their experiences.	Pre workshop questionnaire assessed teacher attitudes towards self-regulated learning. Group discussions about how to apply self-regulated learning techniques to subject-specific challenges raised during the sessions – also linked to Community of Practice recommendations (MacMahon et al., 2022).
Reflection on learner acquisition: for example, identifying next steps, positive feedback, or group reflection.	Training arranged over two sessions to allow time to set and reflect on targets. Time spent by researcher talking to teachers about current practice and linking to theory and workshop content.

Learner assessment of mastery. This could be through self-assessment or external criteria for assessing performance.

Pre and post assessments for teacher's self-reflection using the Teacher Attitudes Towards Self-regulated Learners Scale.

Education Endowment Foundation (2018) checklist shared with teachers in workshop one (Appendix N) that contains a criterion for what effective teaching of self-regulated learners looks like.

Figure 3. 3 *Six Effective Research Implementation Strategies Highlighted by MacMahon et al., 2022*

MacMahon et al., (2022) summary of effective research implementation strategies.
• The involvement of willing partners who are focused on improving their practice. • Makes use of an organised, systematic, iterative approach. • Time to engage with a ‘knowledge broker’ or facilitator who can support co-construction of contextually relevant application of the research. • Develop an ongoing partnership that supports the implementation • Builds capacity that includes supporting teachers to be active in how they embed into their practice. • Make use of Community of Practice (CoP, having a group of colleagues that are committed to embedding into their context as a supportive network).

3.3.2 Quantitative Phase.

Quantitative measures evaluated the impact of the workshops on teachers’ pre and post perspectives on their self-efficacy as teachers (Teacher Sense of Self-efficacy Scale, Tschannen-Moran & Hoy, 2001, Appendix O); and their attitude towards self-regulated learning (Teacher Attitudes Towards Self-regulated Learning Scale, Steinbach & Stoeger, 2018, Appendix P), reflecting research questions 1 and 2 (Table 3.2). Questionnaires were accessed by an online link sent out to participants via email. Due to small numbers of participants reliable change index (RCI, Jacobson et al., 1984) was used to assess changes to pre and post workshops for both scales.

Fidelity checklists (Appendix Q) were given to all participants following the delivery of all workshop content (after at least week 3 where workshop content was delivered in one session).

3.3.3 Qualitative Phase.

The qualitative data collection was designed to address research questions 3a and 3b (Table 3.2). Recommendations for good practice to designing and reporting qualitative research was considered throughout the research process (Appendix B) using the Consolidated Criteria for Reporting Qualitative Research (COREQ, Tong et al., 2007).

Brief notes were made after each workshop session around what issues were raised or discussed by teachers linked to cognition and metacognition (workshop 1) and motivation (workshop 2) which is referred to (Table 3.2) as 'qualitative data collection in workshop 2'. Qualitative feedback on making use of SRL in the classroom was collected where possible using a focus group format. For school one where only one member of staff attended the re-scheduled workshop two, the session was recorded with permission and their review focused on the use of cognitive and metacognitive strategies. Additionally, at school three the first workshop was recorded for an absent member of staff and agreement was given by the staff present to record the session. The recording was shared with the researcher and comments used where relevant to act as feedback on what was and was not useful in the alternative provision context from the workshop one session.

3.3.4 Focus groups.

The qualitative phase of data collection made use of a focus groups to capture how acceptable the process, of delivering a self-regulated learning focus embedded within the curriculum, was to teachers.

Focus group data is helpful when the aim is to include a range of opinions about practice, policy or programs (Krueger & Casey, 2015). The benefit of the focus group over individual interviews was seen as helping people to clarify their ideas in the group situation and that people who may not think they have a contribution may be prompted to comment in the discussion (Kitzinger, 1995). Kitzinger also warned that group norms could be established that prevent all contributing, however in this context as the focus groups were made up of teachers from different subject areas, this provided a rationale for disagreement (explainable through course differences rather than personal opinions) that mediated this concern. As the aim here was to get information through the social interaction of teachers' perspectives on this process (Braun & Clarke, 2013), focus groups were seen as more beneficial than individual interviews. Groups between 5 and no more than 10 participants were encouraged (Jarvis & Barbena, 2011; Kitzinger, 2015), though in school one a single member of staff provided feedback through a semi-structured interview and review session. Comments and feedback from teachers were collected either during workshop 2 (school one and school three) or as intended at the end of the intervention process using a focus group format with school two (see Table 3.2 for detail of timing and Appendix R for focus group questions).

Reflexive thematic analysis (reflexive TA) was selected as the method of analysing the interview and focus group data as this was consistent with a social constructionist stance and the research aims to understand the perspectives and how teachers made sense of the SRL strategies within the context of their job roles and other demands made of them as interpreted by the researcher, which fits descriptions of the reflexive TA approach (Braun & Clarke, 2013, 2021). An inductive process (bottom-up) was used to identify codes in the data, which allowed codes to be formed without the framework of existing theory (deductive top-down) which was considered consistent with the constructionist perspective that the researcher was listening to the perspectives of the teacher rather than attempting to align them with previous existing theory.

Where a focus group format was used the researcher was the moderator. Focus groups were appropriate as the view of the participants within their group identity as teachers was important, as opposed to their singular views. It was hoped that the group format would promote social interaction around the key issue of how easy it was to facilitate SRL strategies within the day to day delivery of the curriculum. Additionally, focus groups can provide a more contextualised view (Braun & Clarke, 2013) whilst providing time for teachers to construct their views of SRL that may help to influence future likelihood of implementation (Barker et al., 2016).

To avoid potential environmental bias workshops, questionnaires and focus groups were carried out at for all three schools in the second half of the summer term. This

ensured that all schools were considering the workshop materials at the same point in the academic year with similar pressures of course delivery.

3.3.5 Participants.

Secondary schools in two areas of a large East England local authority were sent information about the workshops and participating in the research via email either through the head teacher and/or school inclusion lead or SENCo (Appendix S).

Secondary schools in the local authority were not contacted if they were independent schools (as comprehensive cohorts were being targeted) or if the researcher was already working with those schools as a link educational psychologist (to avoid a conflict of interest between the researcher and their work as a trainee educational psychologist).

Headteachers were asked to complete the online confirmation (Appendix S) if they agreed to recruitment of staff at their schools, this ensured that they had access to the study information.

Once headteachers had agreed in principle for their schools to participate, school staff were approached initially using volunteer sampling. In the first instance this was done using an information flyer (Appendix L) sent through to Special Educational Needs Co-ordinators (SENCo's) via educational psychologists (EPs) in the researcher's area team or via trainee educational psychologists (TEP) in other area teams .

As mentioned in Table 3.2, initially recruitment was intended to make use of volunteer sampling from schools within the researcher's placement authority. Difficulty recruiting multiple staff within the same context during the spring term, 2022, led to change to a purposive recruitment approach. The first school recruited (eight teachers signed up), had low pupil premium funding, which reflects the number of pupils eligible for free school meals through low family income (9.7% compared to a national average of 27%, Julius & Ghosh, 2022). In response the researcher actively recruited in schools with a high pupil premium cohort (Table 3.4).

Sample size calculations were considered inappropriate for a research design grounded in social constructionist principles and using purposive sampling, where the goal of sampling is to provide rich data rather than quantity of data and practicalities about recruitment reduced the researchers control over group sizes. In line with other predominantly qualitative research 'data adequacy' is proposed as an alternative (Vasileiou et al., 2018). Whilst achieving 'saturation levels' is the most commonly used method in qualitative research using interviews for example, (Vasileiou et al., 2018) it is important not to equate frequency of use with best practice (Glenton & Carlsen, 2019). The concept of 'saturation' is not aligned with the overall aims of reflexive thematic analysis (Braun & Clarke, 2022) where depth of analysis is prioritised.

In all three participating schools one member of staff acted as the lead teacher and point of contact for sharing information with other teachers. In school one eight teachers volunteered to participate. In schools 2 and 3 information was shared with

a group of pre-determined teachers as part of their directed time (pastoral time and whole setting CPD directed time respectively). In school two all teachers were either form tutors or heads of year. Teachers were then sent information and consent forms via a link to an online survey (Appendix T).

Table 3. 4 *Summary of the Demographics of the Participating Schools*

School ID	Population	Pupil premium	Type of school
1	1136	9.7.%	Secondary comprehensive
2	1197	29.8%	Secondary Comprehensive
3	55	40%	Secondary alternative Key Stage 4 provision (aged 14-16 years).

A range of different subject specialisms were represented by the teachers across the three schools and within each school (Table 3.5).

Table 3. 5 *Subject Specialisms in the Teacher Participants (some teachers listed in more than one subject area).*

Subject	School one	School two	School three
Humanities (History, Geography, RE)	1	0	0

Subject	School one	School two	School three
PE	0	2	2
Business studies/Computer Science/ IT	0	3	0
Art	0	0	1
Design technology/Food technology/ Horticulture	1	0	3
Performing Arts (Music, Drama and Dance)	1	0	1
Modern Foreign Languages	1	1	0
Core Science (Biology, Chemistry, Physics)	1	0	0
English	1	3	1
Maths	0	1	2
Other responsibilities listed (Head, Deputy, Prince's Trust Co-ordinator)	0	0	3

3.3.6 Procedure.

Table 3.6 outlines the planned delivery of the workshops and the data collection points. Teachers were asked to complete two base line questionnaires at the point that they agreed and confirmed consent to participate: Teacher Self-efficacy Scale (Tschannen-Moran & Hoy, 2001) and Teacher Attitudes Towards Self-regulated Learning Scale (Steinbach & Stoeger, 2018), which were then repeated following workshop 2.

Teachers were invited to attend two afterschool workshops each lasting 90 minutes (Appendix L). Workshop 1 was delivered within two weeks of receipt of teacher consent. In school one this workshop lasted 90 minutes and included time for the teacher to create a plan and targets of what elements to deliver and trial in the following 3 weeks. In school two this workshop lasted for 1 hour and teachers were encouraged to set a target in their own time. In school three workshop one and two content was merged as initially only one meeting slot was given and this took place over 90 minutes.

Workshop 2 was delivered at least 3 weeks after workshop one (schools 1 and 2) and included a brief recap and review of workshop 1, with time to feedback and problem solve about planning how to incorporate key ideas over the remaining 4-5 weeks.

Fidelity checklists were completed at the same point at which participants completed the second set of questionnaires, which for most teachers was around 4 weeks after

workshop one had been delivered. At School three fidelity checklists were handed out as paper copies and completed at the start of the second workshop. Schools 1 and 2 received their fidelity checklists as electronic links to an online survey (response rates for all questionnaires and feedback was low).

Initial plans were to invite teachers to attend a focus group after a period of 8 weeks from the first workshop. In school one only one teacher (8 signed up and 6 attended workshop 1) attended the follow up workshop and this became a recorded feedback session, incorporating focus group themed questions (Appendix R). In school three workshop 1 and 2 content was merged due to being offered one CPD slot, however an additional follow-up session was then requested and this was used as a feedback and review session as all content had been delivered. Only school two received the workshops separately to the focus group feedback, where five teachers attended an additional 40-minute focus group.

3.3.7 Ethics.

The research proposal was approved by the UCL research ethics committee (3.12.21, Appendix U) and included references to guidelines and standards outlined by the British Psychological Society (BPS) Code of Ethics and Conduct (2021) and Code of Human Research Ethics (2021). Ethical principles of respect, competence, responsibility and integrity (BPS, 2021) were considered thorough the research planning and delivery stages. School names have been removed to address the right to privacy of participants. Fully informed consent was used to recruit schools

and teachers and the right to withdraw was made clear at each point of contact (Table 3.7, Appendix L, S and T).

Table 3. 6 Overview of Study Procedure.

	Recruitment	Pre-workshop	Workshop 1	Workshop 2	Focus group (Qualitative phase)
Planned action	Headteacher consent to recruit staff through SENCo or inclusion lead.	Online teacher consent 2 x questionnaires completed online (Quantitative phase)	Week 1	Week 3 or 4.	Week 8. Complete fidelity checklist. 2 x questionnaires completed online (Quantitative phase)

Data protection regulations were met through an application to the UCL data protection committee that ensured the research design met with the requirements of the Data Protection Act (2018) and the General Data Protection Regulations (ICO, 2018).

Table 3. 7 *Informed Consent and Right to Withdraw at Different Stages of the Research*

Phase of research	Type of consent	Completed by
Recruitment of schools	Opt-in	Head teachers were approached and asked to opt-in to initiate recruitment of teachers.
Recruitment of teachers	Opt-in	Teachers were recruited by volunteer sampling and gave informed consent to participant. Where teachers were offered the workshops during their directed time all teachers had opt-in consent, where they could (and did) opt-out by not completing the questionnaires if they chose not to whilst still accessing the workshops. All participants were reminded at each point of contact (both written and face to face/online) that their data could be withdrawn up until the 31st August, 2022.

Teacher data was anonymised using pre-agreed codes that teachers could use to withdraw their data at any time (up until the 31.08.2022). Data was stored on a password protected laptop and in line with GDPR regulations (ICO, 2018). Email addresses captured by the online survey maker as part of the consent process, were deleted from the downloaded data files at the end of the data analysis process. Recordings were deleted following transcription, at the end of the data analysis process (October 2022). Secondary schools were selected that the researcher had no previous contact with in their role as a link educational psychologist to further ensure students were not identifiable to the researcher if discussed in feedback

sessions. Privacy issues were considered again for the focus group contribution to the research (Jarvis & Barbena, 2011).

TEAMS was used for school one and school two feedback that generated a basic transcription that the recording was then used to refine and amend. Anonymity in the transcription process protected the identity of participants as the content of the discussion at the point of transcription was not linked to individuals.

Subject specialist areas were grouped to reduce the ability to identify teachers in subject areas where staff numbers are likely to be smaller (e.g. Business and Food Technology).

3.3.8 Intervention.

The researcher developed the intervention 'Developing Self-regulated learners' aimed at secondary school teaching staff (Figure 3.2 and 3.4, Table 3.1 and 3.8, Appendix A), by integrating a range of evidence-based practice associated with successful self-regulated learning interventions (For example Figure 3.1), which has been outlined in the introduction. The intervention was based around three key components of self-regulated learning; cognition for learners, metacognitive practices and motivating learners (Figure 3.2).

The intervention was designed as two ninety-minute interactive workshops with a target setting sheet that teachers could use to pick out relevant strategies for their specialist area in between workshops (Appendix A) . The workshops encouraged

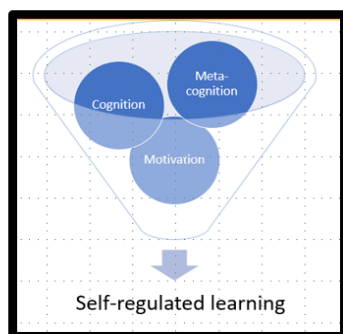
teachers to select and commit to incorporating elements into their classroom practice, setting themselves targets and planning in when elements were appropriate using their schemes of learning. It was important to the researcher, from an ethical perspective, not to disrupt the teaching and delivery of the courses, the intervention was intended to be incorporated into the delivery as it currently stood. It was made clear to teachers that if that was not possible or became problematic, feedback to that effect was also a helpful part of the intervention process. This was intended to minimise stress and perceived pressure that may have been added to the teachers' workload and also to reduce any negative impact on pupils by reiterating that course delivery should be prioritised. For this reason, a manualised intervention was not delivered, though resources were provided where relevant or requested (Figure 3.4, Table 3.8 and Appendix V).

The content of the workshop was drawn from classroom relevant practice that covered each of the three key components, Cognition, Metacognition and Motivation (Figure 3.4). Teachers were presented with theory and examples relevant to each component and asked to think about how it would be relevant within their subject areas. Teachers had time to share ideas and problem-solve around current course elements that were not used well by students and how to adapt or re-frame learning strategies using the theory in class to increase palatability to students.

Muijs and Bokhove (2020) caution that the impact of SRL interventions are unlikely to have time to embed and show impact of practice over less than two terms, with other researchers suggested that a minimum of one month is needed for a positive

impact (Hattie et al.,1996). In this research the aim was to gather feedback from teachers of their experience over eight weeks on the acceptability and perceived feasibility of embedding the practice rather than measure outcome.

Figure 3. 4 Workshop Handout



Reframe mistakes.

Humans are designed to learn the 'gist' rather than details. It's normal to get detail wrong on first recall.

Attribution theory.

Model and reinforce the value that success is about effort.

Adolescent development.

Feelings of shame are hard to shake off. Provide options and foster two-way respect through curious questions.

Model regulation.

Become aware of your own shark music.



Identify key elements of your course that are easy wins

Cognition.

- Learning is when we recall or use information at a different point in time from when it was first experienced.
- Working memory can only hold a few items (5-9) of new information at a time; chunking information and using mnemonics can help the brain hold onto the information and make it more likely to be processed and then remembered.
- Successful learners put in a lot of effort (repetition) in and this affects their outcomes
- Because we can't see the effort put in by other learners (and teachers), we might accidentally think that learning is easy for them.
- To improve we need to be able to make mistakes; these will show us what we need help with and what we find challenging.

Retrieval practice: review key concepts over the year, **Spacing:** over time leave bigger time gaps when you revisit information, **Cognitive load:** deliver learning in small chunks to avoid overloading working memory.

Meta Cognition.

- Highlight to students where you are using planning, monitoring and evaluation as part of your learning cycles to model this approach to learning (how are you metacognitive about your own work load?).
- Provide opportunities for students to plan their work out (writing frames are good examples of this for longer answers).
- Provide opportunities for students to monitor how they are getting on (through questioning and after short assessments reflect on their own targets).
- Provide opportunities for students to evaluate their own work against the mark schemes and assessment criteria wherever possible.
- Try out different revision or learning techniques with the class then ask them to feed back on how useful they found them.

Planning.

Monitoring.

Evaluation.

Motivation.

- **Weiner's theory of attribution:** if we expect to fail or succeed at a task will determine how much effort we are willing to put in.
- **Dweck's- growth mindset:** Everyone can learn with the right support in place and the belief in that philosophy; adapt tasks that students find hard to help them access success through effort.
- **Vygotsky's zone of proximal development:** is the learning task focused in 'what I can do with support' space for all learners?
- **Model regulation in your classroom:** name feelings of irritation and frustration when you feel it and see it and show your class how to manage those natural and difficult experiences.
- **The adolescent audience:** this is a time of wanting to feel aligned with peers (not adults), seeking autonomy and agency. Offer choices rather than ultimatums, remain aware of the heightened embarrassment that perceived failure in front of peers can bring.

Table 3. 8 *Summary Content of Each Workshop Linked to Examples of Classroom Practice*

Workshop one content (90mins)	1. Welcome, general information, informed consent and anonymity, roles and expectations. 2. Psycho-education: Principles and theories of successful learners (cognition). Metacognition and self-regulated learning. 3. Benefits of using this approach with adolescent learners. 4. Questions and discussion of key problem areas. 5. Trouble-shooting using problems identified and sharing of ideas. 6. Planning next steps and practicalities of delivering agreed content across the week (fidelity input). 7. Agree goals before next workshop and identify barriers.	Cognition: Chunking, Rehearsal, schemas, prior knowledge and sequencing retrieval practice in lesson planning. Metacognition: Writing frames, structure lists (PEEL*, WHW* and POW*), Graphic organisers, modelling from teacher, assessment wrappers. *Point, Evidence, Explain, Link. What How Why. Pick an idea, Organise my notes, Write and say more.
Workshop two content (90 mins)	1. Review workshop 1 content. 2. Check in: how is it going? Share successes and barriers 3. Review key goals for classroom practice. 4. Psycho-education: Motivation relevant to secondary classrooms 5. Set new/ or review and refine practice goals where needed.	Motivation: Using approaches appropriate to adolescent development (agency, autonomy). Awareness of increased peer group sensitivity. Teacher language linked to growth mindset. Detecting and reframing student fixed mindset comments.

A fidelity checklist was included as part of information collecting to give participants a chance to articulate how much or how little they had made use of the strategies from the workshop in a format that was anonymous and did not depend on attendance at a focus group. This provided a voice to those who may not have felt comfortable sharing with the group or acknowledging that they had not used the strategies.

Fidelity of the intervention delivery was assessed by the teacher, who completed a fidelity check (Appendix Q) between week 4 and 8 to reflect on their own use of the strategies and ideas. Fidelity was assessed using the five criteria identified by Bishop et al. (2014) of checking: adherence; dosage; quality of teaching; understanding of concepts and program adaptations. Teachers used a checklist created by the researcher that reflects the recommendations made by Bishop et al. (2014). Whilst teacher self-assessed fidelity is seen as less reliable than observation data (Hansen & McNeal, 1999) it was seen here as appropriate to collect information on teacher perspectives on dosage and teacher views of student engagement over time compared to a one-off observation by the researcher. Teachers were not directed to use the approaches in a set number of lessons as the fidelity checklists were in place for teachers to feedback how much it had been in use without judgement as per planning to reduce any potential additional stress or burden on the teacher's day to day demands and to ensure teachers felt comfortable feeding back regardless of amount of use.

3.3.9 Measures.

For research questions 1 and 2 (see Table 3.2) it was not considered necessary to use tools which were norm referenced, as this is suggested as less helpful when

assessing a multi-dimensional construct (Pintrich et al., 2000). Both constructs being assessed in this research (self-efficacy and teacher attitudes towards SRL) can be described as multi-dimensional.

The teachers' sense of efficacy scale developed by Tschannen-Moran & Hoy, (2001) is a 12 item questionnaire, using a five-point Likert scale, that has reliability measures of .90 for overall scores and reliability for subscales are also high at .81 for engagement and .86 for instruction management in the short-form version, which was used here (Appendix O). Sub scores of the three elements of engagement, instructional practices and classroom management, were calculated by combining items as suggested by the authors which provided each participant with four scores (a total sense of self-efficacy alongside three sub scores). This questionnaire was used to help answer research question one.

Examples of questions from this scale include:

- How much can you do to control disruptive behaviour in the classroom?
- How much can you do to motivate students who show low interest in school work?

The use of a pre-existing and validated scales for self-efficacy was important in this context to assess the impact this intervention has or has not had on teachers for constructs that are well developed across broad research domains. The use of a validated measure increases the ability to compare the impact of teacher self-efficacy with other research beyond self-regulated learning.

The concept of self-regulated learning contains multiple dimensions, making it harder to assess the validity of tools that determine SRL, particularly as tools can be designed with a focus on subject specific aims of SRL (for example, Thomas et al., 2008).

Teachers' attitudes towards self-regulated learning techniques was assessed using a 28-item self-report questionnaire (Appendix P) with a six-point Likert scale ranging from completely disagree to completely agree. The Teacher Attitudes Towards Self-regulated Learning Scale (Steinbach & Stoeger, 2018) was selected as during its development it was found to be predictive of future use of self-regulated learning strategies by teachers that was seen as a helpful addition to the adherence data also being collected. This tool was used to answer research question two.

Examples of questions from this scale include:

It is important to me personally that my students...

...know exactly where their strengths lie with respect to learning contents.

...know exactly where their weaknesses lie with respect to learning contents.

The 28 items create an overall score but also can be grouped into seven components to create the following sub-scales based on importance teachers held for:

- Self-assessment (students' knowledge of their strengths)
- Goal setting (use of self-assessment to set goals)
- Strategic planning (planning the order to address task)

- Strategy implementation (student involvement in planning action)
- Strategy monitoring (reviewing the effectiveness of strategies)
- Strategy adjustment (making tweaks to strategies following review)
- Outcome evaluation (assessing the impact against goals set)

Qualitative responses were noted anonymously at workshop discussions and audio recorded at workshop 2 or post-intervention focus-group meetings to gather teacher perspectives to using the strategies and the feasibility of the process within a busy classroom environment. This data was used to answer research questions 3a and 3b.

3.3.10 Data analysis

A focus group format was used with the researcher as moderator to promote social interaction around the key issue of how easy it was to facilitate SRL strategies within the day to day delivery of the curriculum and provide a more contextualised view (Braun & Clarke, 2013). Rationale for the focus group questions is shown alongside the focus group script in Appendix R. Questions were chosen to elicit responses on effectiveness, self-efficacy and facilitators and barriers.

The qualitative data was analysed using reflexive TA (Braun & Clarke, 2021, Byrne, 2021) and followed the processes outlined in Table 3.9. The method used is acknowledged as not ‘the’ way to carry out TA but rather the way chosen by this researcher as recommended by Braun and Clarke, (2019). Codes were generated by the researcher for each school and organised into themes, an inductive method

driven by data, was used (Byrne, 2021) as there were no pre-existing theories that the researcher anticipated mapping the teachers experiences onto. Member checking was not carried out as this was inconsistent to the approach of reflexive TA where the subjective interpretation of the themes is the goal of analysis rather than representing the views of individual group members using a positivist perspective (Braun & Clarke, 2022). After codes were generated for each school case separately and written up as an individual case report, a cross case synthesis (Yin, 2004) as described in stage 7 (Table 3.9) was carried out and the school themes were analysed to determine if there were over-arching themes across the three contexts.

Data editing for quotes used in the results section were shortened using [...] and did not remove any content that would change the meaning, only speech considered an 'aside' to the main focus of the quote.

Table 3.9 *Reflexive Thematic Analysis (reflexive TA, Braun & Clarke, 2013) with Notes on Process Used*

Stages of Reflexive Thematic Analysis	Actions
Stage 1	Data preparation (transcription). The researcher carried out the transcription which overlapped with the familiarisation process of stage 2.
Stage 2	Reading and familiarisation; noting items of potential interest with interpretations noted. Notes were made across transcripts to record first responses.

Stages of Reflexive Thematic Analysis	Actions
Stage 3	Generating initial codes (first process carried out using NVivo subsequent analysis carried out in word using highlighting and comments tab to record reflections).
Stage 4	Developing emergent themes – identifying and interpreting meaning across codes. Returning to stage 3 and 4 after a break to review codes using a pen and paper approach.
Stage 5	Defining and naming themes: Searching for connections between codes. Discussing reflections and themes with peers. Producing a first visual depiction of the relationships between themes. Explaining using example codes interpretation of codes and allocation to themes to third party researcher.
Stage 6	Stages 3-5 repeated for each focus group.
Stage 7	Identifying themes and checking if there are superordinate themes across focus groups. Producing a visual depiction of this analysis. Discussing the interpretation and theme generation with my research supervisor. Finalising a cross case analysis if comparison across cases is appropriate.

Stages of Reflexive Thematic Analysis	Actions
Stage 8	Writing up and finalising analysis.

3.3.11 Researcher Reflexivity.

Research reflexivity has been recorded throughout the process and as it is considered an important part of the research process to acknowledge and record the researchers perspectives and decision making as this can and will impact on design, analysis and interpretations of the data. Reflexivity is recorded in a log format following the research process and at different decision making points (Appendix W).

3.3.12 Trustworthiness of analysis.

Guided by the overview of trustworthiness in qualitative research presented by Shenton (2004), credibility, transferability, dependability and confirmability are used to replace positivist approaches of validity, generalisability, reliability and objectivity. A summary is provided detailing each issue and how it was addressed in this research (Appendix X) and a checklist for qualitative research (Appendix B) also addresses these issues as an overview.

3.4 Results

In this section the data collection process is explained initially before an analysis of each school setting. For each setting pre and post workshop questionnaire data is considered first to consider whether teacher reported self-efficacy and attitude to self-regulated learning have increased post workshop (research questions 1 and 2, Table 3.2) Qualitative analysis of interview or focus group discussions are used to further explore teachers perspectives on the use of SRL in their classrooms including how much SRL techniques were used by teachers and how easy teachers found it to incorporate SRL into teaching (research questions 3a and 3b, Table 3.2) is explored. Finally, qualitative data is considered collectively for the schools to identify themes that are relevant to all settings.

3.4.1 Questionnaire data overview.

Data collected from participants using questionnaires was matched, for pre and post measures, using a code generated by the participants (a suggested combination of the initial letter of their name, their department, their school and the year they started teaching). In the following situations data was assumed to be matching pairs if;

- The initial letter was the same and the following letters were the same but in a different order.
- The year was the same and the initial letter matched.

Across all three participating schools eighteen teachers completed the Teacher attitude to self-regulated learning scale (Steinbach & Stoeger, 2016) at the point of

recruitment and thirteen completed it post-workshop. Fifteen teachers completed the Teacher Sense of Self-efficacy Scale (Tschannen-Moran & Hoy, 2001) at the start with thirteen completing it post-workshop. Not all of the codes given matched for the pre and post data, with nine pre and post matches for the Teacher Attitude Towards Self-regulated Learning Scale and eight matches for the Teacher Sense of Self-Efficacy Scale. Reliable change Index (RCI, Jacobsen et al., 1984) was used to assess change over time in those cases where matched data was available. Reliable change index calculations represent the amount of change needed between pre and post scores (for total scores and sub-scales) for change to be significant at a 95% confidence level.

From the eighteen teachers who completed the Teacher Attitude Towards Self-Regulated Learning Scale (Steinbach & Stoeger, 2016) at the start of the workshops the mean total raw score was 141 out of 168 (range 116 to 165). At the end the mean score of thirteen teachers was 145 (range 123-167). Mean scores across the twenty-eight questions was used by the scale authors to calculate a teacher attitude towards self-regulated Learning score, which for this group of eighteen teachers was $M=5$ for total scale score. The reliable change criterion (RCC) was 0.41 (calculated at a 95% confidence level). Further subscales were calculated and are shown below (Table 3.10). Average difference across the eight participants who completed pre and post scales showed a non-significant small positive increase (0.06) in overall teacher attitudes towards self-regulated learning.

Of the fifteen teachers who completed the Teacher Sense of Self-efficacy Scale (Tschannen-Moran & Hoy, 2001) at the start of the workshops the mean raw score was 75 (range 66 to 94) and post workshop eleven responses showed a raw score mean of 79 (range 78-90) out of 108. Mean scores across the items were calculated, $M = 6.7$. The RCC for the Teacher Sense of Self-efficacy Scale was 0.86 at a 95% confidence level any difference (increase or decrease) of this size or greater was considered a significant change. This scale can be further divided into subscales and are shown below (Table 3.11). Average difference across the seven participants completing pre and post scales showed a non-significant small positive increase (0.57) in overall teacher sense of self-efficacy.

Table 3. 10 *Subscales and Reliable Change Criterion (at 95% confidence level) used to Assess Change in the Teachers Attitudes to Self-regulated Learning Scale (Steinbach & Stoeger, 2016)*

Sub-scale	Reliable change criterion
Self-assessment	0.66
Goal setting	0.93
Strategic planning	0.87
Strategy implementation	0.48
Strategy monitoring	0.88

Strategy adjustment	0.54
Outcome evaluation	0.82

Table 3. 11 *Subscales and Reliable Change Criterion (at 95% confidence level) used to Assess Change in the Teacher Sense of Self-efficacy Scale*

<i>Sub-scale</i>	<i>Reliable change criterion</i>
Efficacy in student engagement	1.45
Efficacy in classroom strategies	1.24
Efficacy in classroom management	1.24

3.4.2 Qualitative analysis overview

Transcripts from each school were coded (Appendix Y) and themes developed inductively by the researcher (Figure 3.5, Appendix Z). Detail regarding the coding for each theme and example extracts to illustrate themes is given for each school individually in the text. Following individual analysis individual school themes were merged to create three over-arching themes that are discussed in section 3.4.6.

Figure 3. 5 *Researcher Developed Themes from Each School*

School one	School two	School three
Aligning classroom practice to SRL and indicators of change.	Meeting the needs of learners using SRL.	Damaged by the system: Fear of failure.
Classroom equity and adolescence.	The challenge of Individual differences was addressed by SRL.	SRL is part of my teaching now and future plans.
Flexibility of the teacher increases student choice and agency.	Difficulties that were harder to address.	Frustrated with the testing culture.
Relational elements of classroom prioritised: trust and respect.	Systemic issues as a barrier to effective teaching.	Teachers as the change.
	Intention to implement SRL in the future.	

3.4.3 School one

Ten teachers initially put their names forward for the workshops on self-regulated learning in school one. Eight teachers went on to sign up as part of the volunteer recruitment and agreed to complete the data collection as part of the research project. Of those eight teachers only four completed the pre-measures with their consent forms. Only one member of staff went on to complete both the pre and post questionnaires and attended workshop two. Following two unsuccessful attempts to re-schedule workshop two, it was agreed with participant A that workshop two would include a review and feedback in place of the focus group and participant A was the

sole attendee. A recorded version of workshop two was sent to School one for those who could not attend online, however this did not result in any follow up post workshop completion of surveys or communication with the researcher.

Quantitative phase.

Reliable change was calculated for participant A's responses to both the Teacher Attitudes towards Self-regulated Learning Scales (Steinbach & Stoecker, 2016, Table 3.12) and the Teacher Sense of Self-efficacy Scale (Tschannen-Moran & Hoy, 2001, Table 3.13). Teacher attitudes towards self-regulated learning showed a significant reliable change difference pre and post workshops for total score and three sub-scales; Strategy implementation, strategy monitoring and strategy adjustment (Table 3.12). Strategic planning was the only sub-scale where there was a decrease in score pre and post workshop.

There was a non-significant increase in scores pre and post workshops for Participant A scales for teacher sense of self-efficacy. Table 3.13 shows that whilst the results may not have been significant there were post workshop increases for all sub-scales, except teacher efficacy for student engagement which showed no change.

Table 3.12 School one, Participant A's Pre and Post Scores for Teacher Attitudes to Self-regulated Learning (TASRL, Steinbach & Stoeger, 2016)

TASRL scale	pre	post	Difference*
Total TASRL	4.68	5.18	0.5
Self-assessment	4.5	5	0.5
Goal setting	4.5	5	0.5
Strategic planning	4.75	4.5	-0.25
Strategic implementation	5	5.5	0.5
Strategy monitoring	4.25	5.5	1.25
Strategy adjustment	4.5	5.5	1.0
Outcome evaluation	5.25	5.25	0

**Significant differences are highlighted in green when there has been an increase post-workshop and red where there has been a post-workshop decreased in score.*

Table 3.13 School one, Participant A's Pre and Post Scores for Teacher Sense of Self-efficacy Scale (TSES) and Subscales

TSES scale	pre	post	Difference*
Total TSES	7	7.5	0.5
Efficacy in student engagement	6	6	0
Efficacy in classroom strategies	7.5	8	0.5
Efficacy in classroom management	7.5	8.5	1.0

**Significant differences are highlighted in green when there has been an increase post-workshop and red where there has been a post-workshop decreased in score.*

Responses to the fidelity questionnaires (completed only by participant A, Appendix Q) show that they were confident that they had been able to make use of all three elements of SRL in their lessons and particularly mentioned that they were spending more time in lessons

“explaining why certain revision strategies are useful for different outcomes”.

Qualitative analysis of School one discussion.

As mentioned only one participant (early career, male teacher) attended workshop 2 and this led to the workshop being merged with the review and feedback and was not a focus group as planned. A reflexive thematic analysis was undertaken (Table 3.14) following transcription of the semi-structured interview and discussion that took place in lieu of workshop 2 and the focus group feedback.

Seven themes were assigned, however, 'challenges that impact learning', 'dilemmas in role' and 'personal values' were collated into one theme. In brackets the part of SRL that sits with the 'Aligning classroom practice to SRL' codes are given to ensure that they can be linked to one of the underpinning themes of cognition, metacognition or motivation that were put forward in the workshops. It was important to check that all three elements of SRL were represented by teachers perspectives.

Table 3. 14 *School one: Example Codes for Themes Allocated*

Codes	Themes
• Explaining theory behind practice.(Cognition) • Explanations for why study skills work.(Cognition) • Giving advice on 'why' it would help. (Cognition) • Valuing independence and decision making of students. (metacognitive review and motivation) • When given choice- not all needed help on same topic. (metacognition, monitoring). • Thinking about how to add in to next year. • Anticipating greater benefit from planning it into start of year. • Articulating clear plans to include SRL into teaching cycle. • Delivering study skills information in one go is not appealing.	Aligning classroom practice to SRL and indicators of change.
• Helpful to explain to whole class. • Helping those who don't speak up. • Increase in students asking study questions. • Students who don't ask are at disadvantage. • Not all students not talking don't care (recognising SEMH). • Validating their difficulties • Creating space to feel comfortable to ask for help.	Classroom equity and adolescence.
• Wanting to be able to support study skills. • Conflict: wanting to help and wanting those who aren't working to get a consequence. • Having a reflective approach to work. • Conflict: Exciting teacher versus boring narrative.	Value based decisions.

Codes	Themes
- Relationship building to gain respect. - Focus on year 10 and the gap in support. - Developing study skills is a challenge at home. - Relationship building didn't happen due to Covid-19. - Valuing extra-curricular time with students.	Impact of Covid-19 lockdown on teachers' perspectives

Aligning classroom practice to SRL and indicators of change.

To answer research question 3a, in school one there are elements of all three parts of SRL referred to by the teacher. They particularly focus on 'cognition' and talk about,

“ explaining why certain things are done...why certain strategies fit some things (content) better than others...”.

The reference made to future plans to start with the next year group and integrate revision strategies into the planning every six weeks, is a strong indicator that the SRL principles had been taken on by the teacher and would be in continued use.

“... like every six weeks or so, you just put in a 20 minute part in the lesson about a different revision technique ... We're gonna... have a go at doing mind maps...”

Classroom equity and adolescence.

The workshop content encourages teachers to share cognition theory with their classes rather than just using it to inform planning in the background. The teacher from School one included several references to explaining to the class the 'why' behind using certain strategies and their recognition that this process enabled all students to access explanations.

“That actually explaining it as a whole class...I feel like it gives the ones that might not speak up...the same option to try something different”

The whole class approach then led to a reflection that the impact had been on a subgroup of pupils asking specific and additional follow up questions regarding study advice.

“some students asking more questions around revising”

Positioning themselves, as a source of studying information and advice, rather than just as someone who delivers content information had changed the dynamic of the conversations between the teacher and some members of the class – not always those expected, leading to increased equity of access to study information.

“won’t all ask when needed”

The previous position, of only giving out advice when asked specifically, prioritised students who were in the privileged position of being confident and able to articulate their need for additional support. Though the teacher did acknowledge that there this was not the complete answer to being more inclusive through their comment that ‘some won’t engage’. Overall the researcher had a sense from this teacher that they were pleased to have captured an increased audience for their study advice and a sense of pride that generally students “won’t be left out” by this more inclusive approach promoted by SRL techniques.

Flexibility of the teacher increases student choice and agency.

A key element of this teacher's practice that they promoted heavily in the discussion was their engagement with flexibility of their teaching methods through discussion with the student's needs. Initially this was noticed in their comments around explaining the cognition theory behind study techniques,

"why some strategies fit some better than others"

"pros and cons of techniques...when to use and when less helpful"

However, it was expanded on in several ways that made the researcher feel that the teacher was noticing and generalising the approach to promote choice for the students, this has the benefit of reinforcing the metacognitive element of their lessons (what do I need to do, what has worked before, what advice has been useful?). Offering choice in the lessons models the belief that the learning is situated with the student and not the teacher. The teacher showed an intention to work further on this

"20 minutes every 6 weeks"

Though there was also some trepidation about how to provide clear background explanation for the cognition theories behind different study strategies that demonstrates a dilemma the teacher holds around providing the knowledge students need and the delivery of engaging lessons. Demonstrating what the researcher

perceived to be an underlying construct about a teacher's role being one of entertaining the class,

“making it sounds like something that isn't very dry.”

“I've just tried to explain to them that [...] not everything is exciting.”

Relational elements of classroom prioritised: trust and respect.

After the researcher had delivered the ‘motivation’ element of the training the teacher appeared to the researcher to heavily identify with promoting motivation to engage in the classroom through investing in relationships that were non-subject based.

“What you do outside the classroom benefits inside a lot more than I...realised”

The teacher's perspective twice was voiced in the context of being a contradiction to what others might think, that were voiced as “old school” attitudes of “if you don't like it then...” approach and they referred to “barking orders”. This theme was highly connected to the choice and agency promotion as the teacher expressed a view to avoid ‘control and coercion’ which are antithesis of the agency this teacher was keen to promote.

Overall the approaches discussed around self-regulated learning either appeared to fit well with the sense of identify that this teacher was developing or complimented and increased the sense of self-efficacy that they had in the classroom and was

reflected by increased but non-significant teacher sense of self-efficacy scores following the second session (Tschannen-Moran & Hoy, 2001, Table 3.13) . The researcher was left wondering if these perspectives were connected to the professional climate of the school or were rooted in the personal journey through newly qualified status to three years in through mainly pandemic teaching that this professional had experienced. The articulation of a desire to use the self-regulated learning focus to connect with students was something this researcher could relate to.

3.4.4 School two

Sixteen teachers were offered the workshops at school two as part of their pastoral directed time (all were members of the key stage 3 pastoral team as either form tutors or year leads).

Quantitative phase.

Although four teachers completed the pre-teacher attitude to SRL scale only two completed the post to enable a comparison (Steinbach & Stoeger, 2016, Table 3.15), with both respondents recording a decreased score for attitude to SRL post workshop 2. Reliable change index calculations showed that there was an overall decrease in both school two participants overall scores post workshop though only participant C's score was significantly lower. For Participant B's a significant decrease was seen in strategy monitoring and for participant C there was a significant decrease in the self-assessment score.

The same participants also completed pre and post scores for Teacher Sense of Self Efficacy Scale (Tschannen-Moran & Hoy, 2001, Table 3.16). Participant B showed a significant increase in overall sense of self-efficacy, efficacy in student engagement and efficacy in classroom strategies. Participant B had a none significant increase in efficacy in classroom management. Participant C's scores post workshop for self-efficacy, showed a non-significant decrease in self-efficacy, except in efficacy in classroom management where their score showed a non-significant increase.

Responses to fidelity questionnaires from the three teachers who completed them show that the teachers felt they had used elements of all three elements of SRL in their lessons following the workshops (Appendix Q).

Following difficulties organising workshop 2 with School one the researcher considered methods to assess acceptability of the workshops for teachers generally. This led to School two being offered a voluntary workshop evaluation form to complete at the end of workshop 2. Nine teachers completed the evaluation questionnaire, which showed that all teachers felt that they had a greater understanding of SRL following the workshops (Appendix AA, Figure 3.6).

Table 3.15 *School two, Pre and Post Scores for Teacher Attitudes to Self-regulated Learning and Sub-scales (TASRL, Steinbach & Stoeger, 2016)*

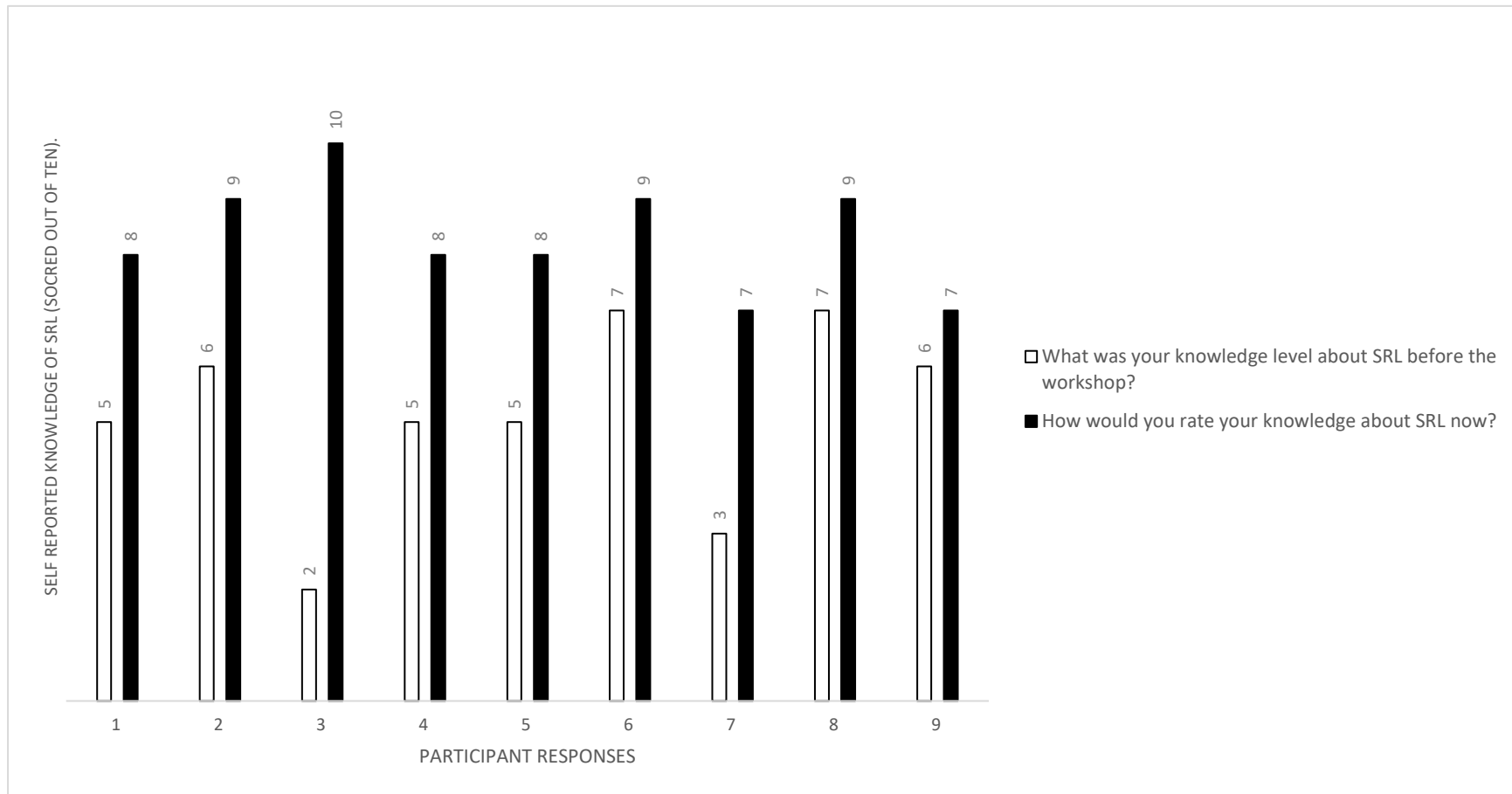
TASRL scales	Participant 2B difference*	Participant 2C difference*
Total TASRL	-0.18	-0.5
Self-assessment	0.25	-2.0
Goal setting	0	-0.5
Strategic planning	0.25	0.5
Strategic implementation	0.25	-0.25
Strategy monitoring	-1.0	-0.75
Strategy adjustment	0	-0.5
Outcome evaluation	0	0

*Significant differences are highlighted in green when there has been an increase post-workshop and red where there has been a post-workshop decreased in score

Table 3.16 School two, Pre and Post Scores for School two Teachers Sense of Self-efficacy Scale (TSES, Tschannen-Moran & Hoy, 2001)

TSES scale	Participant 2B difference*	Participant 2C difference*
Total TSES	1.7	-0.2
Efficacy in student engagement	2	-0.5
Efficacy in classroom strategies	2	-0.5
Efficacy in classroom management	1	0.5

Figure 3. 6 *Pre and Post Workshop Feedback on Knowledge of Self-regulated Learning*



The nine teachers who responded felt that the information was presented clearly in the workshops with five people rating the clarity as 10/10, two rated clarity as 9/10 and two people rated clarity as 8/10.

A variety of areas were selected for what teachers liked about the workshops that covered specific knowledge such as “work about the limbic (system) and frontal lobe fascinating” and general teaching practice, “It helped to plan and review lessons better”. When asked what would make the session even better four teachers left this section blank or wrote ‘no comment’ and those who did respond commented on two points; wanting further sessions or more time and asking for classroom example videos of SRL techniques being used in situ.

Teachers selected a range of targets to set themselves following workshop one (Figure 3.7). Several responses focused on metacognition (planning and monitoring), One respondent had picked up on language shifts they were hoping to use to reflect growth mindset from the motivation element of workshop two. The researcher interpreted the comments ‘apply theory to my own practice’ and ‘Research Dan Siegel’s hand brain’ as enthusiasm and a sign of ongoing commitment to the workshop content.

Figure 3. 7 *Teacher Responses to ‘The target I set myself after the 1st workshop was ...?’*



Qualitative analysis

Five teachers (all female members of staff) from School two attended an online focus group following the face to face workshops. The TEAMS meeting was recorded which produced a transcription which was then checked and edited by the researcher using the audio recording.

A reflexive TA was undertaken the codes and five themes the researcher allocated are shown in Table 3.17.

Table 3.17 *School two: Example Codes for Themes Allocated*

Codes	Themes
• Led to greater responsibility in learners • Noticed increased reflection in work (3) • Addresses previous difficulty experienced (“spoon feeding” and too much teacher talk)(4) • Improved planning of tasks (2) • Provided structure that increased independence (4) • Increased motivation noticed (6) • Freed up time for teacher to notice and praise/relational approach (2). • Increased engagement linked to agency/choice in lessons (3) • Increased confidence in students (self-efficacy) (3) • Provides support for those with additional needs (2) • Retention of information is addressed/can check processing (2)	Meeting the needs of learners using SRL.
• When others are clear about task and getting on students who are easily distracted can be on task. • Snowball effect of having a go and finding they can do more – pride/increased self-efficacy • Noticing the ability of those usually supported by TA’s* and LSA’s* • Some students are quick to give up without support (3) • Time pressures lead to providing quick answers rather than developing skills. (2)	The challenge of Individual differences was addressed by SRL.

Codes	Themes
• Need to have a purpose for knowledge in the real world (4) Why can't I just google it? Mindset • Perception that the teacher needs to do all the work • Teacher desire to avoid being 'boring' • Socio-economic make up of their school making motivation harder (2) • Discussion about how confident and able they were to explain SRL to colleagues (3) . • Time needed to address motivation element (2)	Difficulties that were harder to address
• Option subject was not student's choice/ or staff members (2) • Some students need additional support with English rather than pressure of GCSE's (EAL* and SEN*) (4) • At primary level TA support may impact student self-efficacy • Summer term is hard time to incorporate new strategies (2).	Systemic issues as a barrier to effective teaching.
• Recognising SRL (metacognition) already part of teacher skills. • Expressed a desire to know more (4) • Anticipated impact on outcomes over time • Discussion about how confident and able they were to explain SRL to colleagues . • Expressed interest in finding out more about SRL in practice (2) • Expressed interest in longer training session than was given • Discussed plan in meeting on how to support each other with this going forward (4)	Intention to implement SRL in the future.

Codes	Themes
Recognising metacognition and cognition as already part of their role or describing what they do that fits (4)	

*EAL = English as an additional language, SEN = Special educational need, TA = teaching assistant, LSA = Learning support assistant.

Participants were numbered in the transcript with numbers in bracket representing an individual response to show a range of people contributed to the discussion.

Meeting the needs of learners using SRL.

In school two a large part of the discussion centred around sharing examples from classroom practice with the group identifying how their practice showed up new skills in their students. The focus on 'taking responsibility' spoke to the researcher of the frustration underpinning teachers' feelings around the pressure of needing to 'produce' results (as in workshop one a teacher had said 'I usually teach to the top') rather than the collaborative process that education with older students might be better suited to.

"with the meta cognition with my key stage five uh, they started taking the responsibility of the work.."

Aligned to that perspective was also the increased level of self-monitoring that took place in these teachers' classes when they gave over control to their students,

"they started reflecting on their work as well. So that was really good."

The phrase "spoon fed" came up for the second time as a commonly experienced previous frustration, echoing thoughts expressed in school one. The large content included in key stage 4 courses appeared to have shifted teaching into teacher talk mode that these teachers were discussing the drawbacks of in light of trying alternate approaches. The teachers did see themselves as colluding in some of the previous issues they had noticed by giving answers quickly to move the lesson on rather promoting study skills. One teacher mentioned recognising through this more interactive way of working that previously students may have appeared to be

listening but they would have not really known that was the case, a moving shift in perspective that articulated a change in practice.

The challenge of Individual differences was addressed by SRL.

An interesting reflection when teachers were asked to consider the impact on individual students was that more time for praise and support was freed up by giving students more structure and guidance to work independently. Scaffolding independent tasks and checklists had appeared to increase focus and motivation rather than overwhelm students with additional needs. More opportunities to praise came up when lessons are structured into shorter tasks.

“He has a lot of needs, [...]he saw that everyone was doing the work. It motivated him to do well as well. So, I thought motivation wise actually really benefit them.”

“It was like, ‘hey, you finished the first half. That’s even better. Come on, let’s move on the second task.’ And then by the end of the lesson, he had, like, a big smile on his face. And he was like, ‘I can do this.’

Difficulties that were harder to address

Despite the positive reviews of trying out SRL techniques there was still an acknowledgement that some students were disengaged from learning, “... they don’t put any effort in.” A large part of the discussion around this issue mirrored a point that was echoed in school three about the purpose of education to the young person.

“It’s like, ‘I don’t need to learn this, I have my phone’.”

“...we do Shakespeare. ‘why do we learn this old language? I don’t need it in my future’.”

A particular focus on motivation was made in one teacher’s reflection on what had been hard to implement. Whilst only one teacher had raised this issue others agreed and the researcher annotated the transcript with (3 people nodding) alongside the following extract to highlight the pause in the conversation it created.

“it’s just kind of our demographic sometimes, because we are in an area of high deprivation, we do tend to struggle with innate motivation [...] it’s hard to unpick that sometimes[...] I thought motivation was going to be tough.”

(laughs)

Systemic issues as a barrier to effective teaching.

A frustration that was discussed around wider systemic issues highlighted a limit to what the school could offer. The wider impact of putting students into GCSE level work when they are not ready (still learning English as an additional language) or would benefit from additional support instead of learning a modern foreign language.

“It’s really hard to actually help him learn English when I have to help the other students pass their GCSE’s”

The inflexibility of the system they were working in was sensed by the researcher as the issue rather than an intolerance to newly arrived students as other students who were in key stage three on arrival were discussed as examples of when they had felt able to support well alongside their teaching schedule.

Intention to implement SRL in the future.

Teachers did discuss their own training needs in regard to developing their SRL techniques more fully and integrating them at the start of the next academic year, which reassured the researcher that the workshop material had resonated with the teachers and been perceived as useful. A particular highlight of this conversation was a spontaneous call to act as peer support for each other as they worked on building up their SRL repertoire.

“ I would definitely like to learn more...”

“If we had more time, it would have been better because then we can, you know, develop our knowledge a bit more...”

3.4.5 School three

Ten teachers attended School's 3 directed time CPD slot where workshop 1 and 2 were delivered as a merged session due to initially being offered only one slot by the alternative provision. Following the merged workshop (covering cognition, metacognition and motivation) the researcher was offered a second follow up slot, to

review the workshop content and make use of it as a focus group and review combined.

Quantitative phase

Six teachers completed pre and post measures for teacher attitudes towards self-regulated learning (Steinbach & Stoeger, 2016). It was noted that Participant D's scores were uniform across all of the surveys that they completed, suggesting lack of engagement in the responses given and therefore a lack of validity of those results, they are also demonstrating no change in position of that teacher, a decision was taken to remove the data from the analysis. Therefore, five teachers from this group completed pre and post measures for teacher attitudes to self-regulated learning (Table 3.18) and four teachers completed pre and post measures for the Teachers sense of self-efficacy scale (Tschannen-Moran & Hoy, 2001, Table 3.19)

School three responses showed a non-significant increase in total attitude towards self-regulated learning following the review and feedback session that acted as the focus group for this setting, except participant F who had a small decrease in overall score. All four of the responses, showed no change for self-assessment post workshop, with just one teacher showing a non-significant increase. A similar pattern is seen for goal setting, strategic planning and strategy monitoring. Two teachers had a significant increase post workshop in strategy implementation with another teacher showing a non-significant increase, and one score is a non-significant decrease. Strategy adjustment also showed two responses post workshop that were significant and two non-significant increases.

Whilst outcome evaluation shows no significant increases, three scores show a non-significant increase, with one teacher reporting a small decrease post workshop.

None of the overall scores for teacher sense of self-efficacy were significantly increased post workshop, though all but one showed an increase in the total self-efficacy score post workshop. Any change in self-efficacy around student engagement was a non-significant increase for teachers, and two of the four teachers had significant increases in efficacy around classroom strategies following the workshops. Whilst none of the changes in scores for efficacy in classroom management were significant, three of the teachers scores reduced in this sub-scale following the workshops.

Table 3.18 School three, Pre and Post Scores for Teacher Attitudes to Self-regulated Learning and Sub-scales (TASRL, Steinbach & Stoeger, 2016)

TASRL scales	Ppt. 3A Difference*	Ppt.3B Difference*	Ppt.3C Difference*	Ppt.3E Difference*	Ppt.3F Difference*
Total TASRL	0.03	0.25	0.18	0.21	-0.03
Self-assessment	0	0	0	0.25	0
Goal setting	0	0.5	0	0.5	0.25
Strategic planning	0	0	0.25	-0.5	0.25
Strategic implementation	0.5	0.25	-0.25	1.0	-0.5
Strategy monitoring	0	0.25	0.25	-0.75	-0.5
Strategy adjustment	0.25	0.25	0.75	0.75	0.5
Outcome evaluation	-0.5	0.5	0.25	0.25	0.75

*Significant differences are highlighted in green when there has been an increase post-workshop and red where there has been a post-workshop decreased in score.

Table 3.19 School three *Pre and Post Scores for School three Teachers Sense of Self-efficacy Scale (TSES, Tschannen-Moran & Hoy, 2001)*

TSES scale	Ppt. 3A	Ppt.3B	Ppt.3C	Ppt.3E
	Difference*	Difference*	Difference*	Difference*
Total TSES	0.5	0.2	0.2	0.6
Efficacy in student engagement	1	0	1	1
Efficacy in classroom strategies	0	1.5	-0.5	1.5
Efficacy in classroom management	0.5	-1	-0.5	-0.5

*Significant differences are highlighted in green when there has been an increase post-workshop and red where there has been a post-workshop decreased in score.

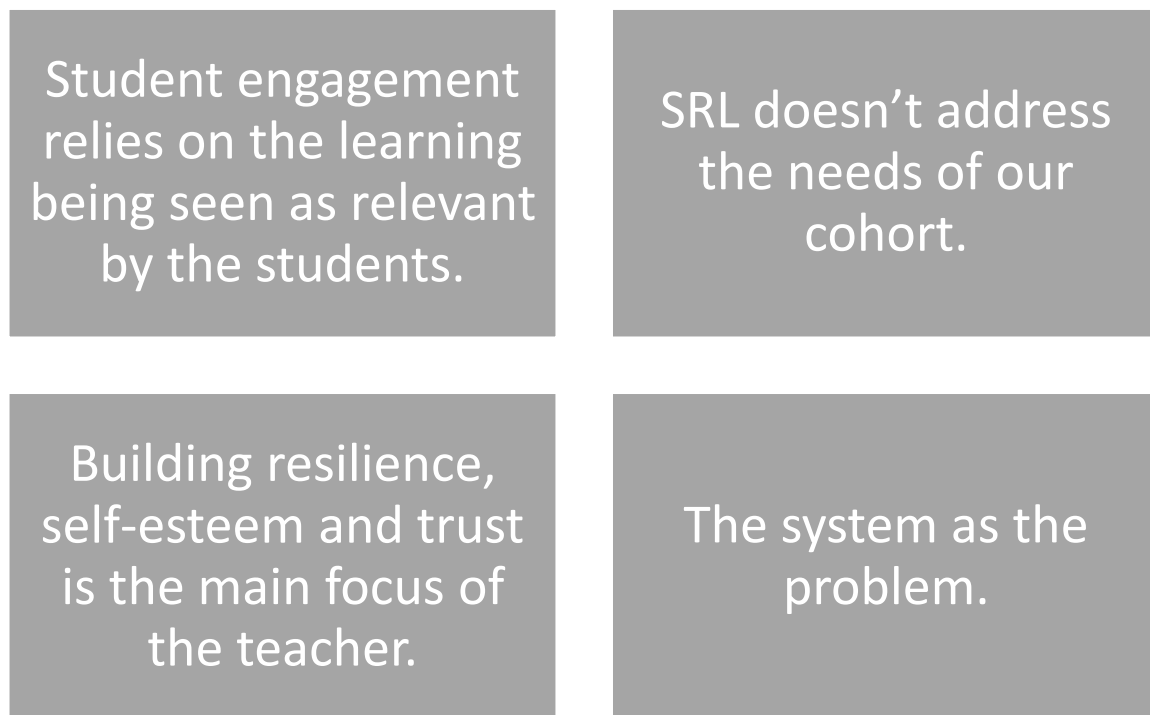
Due to concerns over data collection time as the end of term got closer School three were asked to completed their fidelity checklists in person when the second

workshop date was arranged (Appendix Q). Eight teachers handed in a fidelity check, not all items were completed on each check sheet. Questions on dosage have been adapted to better suit this alternate provision and differed slightly to the online version shown (Appendix Q) .

Qualitative analysis

Fifteen members of staff attended the second workshop, which was used as a review and feedback session (this session was audio recorded and transcribed by the researcher). Transcription showed that a range of participants contributed to the discussion in both meetings representing a breadth of views (Appendix BB). Figure 3.8 illustrates the four main themes pulled out from the transcription of teachers' responses during the discussion that followed content delivery (workshop 1 and 2 content delivered in one session and recorded for absent staff). It is included here to orientate the reader to teachers' perspectives before the main analysis, as it was originally suggested that only one session would be available and these four themes represents teachers' viewpoints in the context of hearing the workshop content but not yet applying strategies or having time to reflect on the workshop content.

Figure 3. 8 *The Four Themes Allocated to Teachers' Discussion on Workshop Content in School three*



Quotes and coding details (Appendix BB) are not reported in full here as the main analysis space is given to the second meeting where teachers were invited to review the training content. The themes (Figure 3.8) demonstrate a sense that the detail of self-regulated learning was initially not considered wholly appropriate to the more disenfranchised cohort that this setting taught with one teacher commenting that there are,

“There are huge barriers before we can start thinking about these kinds of details [...]these are not tiny details, we do need to think about...”

Figure 3. 8 stands in helpful contrast to the post-content review and reflection session that was then arranged with the school. The change in perspective demonstrates the importance of reflection time; allowing staff time to think about and make use of and trial ideas in class has led to an altered perspective than the initial response. The following analysis is in contrast with the initial response from teachers that gently suggested these strategies were not of immediate use in an alternate provision. Comments captured align with the importance of recognising that the past experiences of students impacts on how they will respond to instructional strategies, which can be positive or negative (Boekaerts & Cascallar, 2006) and the teachers' role may be one of creating new positive experiences in the first instance.

One member of staff, who could not attend the whole second session handed over some notes (Appendix CC) before leaving the session by annotating the SRL overview sheet that the researcher had distributed. This interestingly showed that despite the initial group focus on the importance of motivation for students in this alternate provision, this teacher had found it easier to relate the workshop content on Cognition and Metacognitive elements into his classroom planning than the Motivation section. This was then reflected in the main group discussion, with the themes identified by the researcher suggesting both clear current examples in practice and intention of future use (Table 2.20).

Table 3.20 *Example Codes for Themes Allocated*

Codes	Themes
• Importance of normalising mistakes as part of process. • Previous negative experiences of education have made students anxious about making mistakes. • Students have lost confidence in education. • Finding it hard to trust adults and preferring peers. • Wanting to normalise mistakes for learning process. • Recognising the need to protect student's egos. • Pressure of negative consequences if the work isn't at the right level. • Treating earlier wins as a basis to build challenge.	Damaged by the system: Fear of failure
• Recognising Cognition part of workshops is being used already in classes (maths) • Repetition used to support learning • Recognising that project work meets the needs of the learner • Focus on repetition for long term retention • Errorless learning approach • Using early success to build resilience • Guaranteed wins built into lessons (Cognition) • Recognising agency in their non-curriculum course. • Describing cognition theory – bitesize chunks. • Adapted tasks are promoting independence.	SRL is part of my teaching now and future plans.

Codes	Themes
• Great collaboration comes from student understanding of the process (agency) • Practice is part of progress. • Time to think has shifted ideas about how to use language differently. • Getting out of old habits.	
• Using repetition to meet the needs set by the examiner and not the learner. • Using repetition to help them pass the course. • Aspirations for an education system that is about pupil's future life.	Frustrated with the testing culture.
• Promoting the re-imagining of failure and being prepared to experience setbacks. • Desire for adults to model change by addressing their own areas for growth • A desire for adults to change • Adults need to feel uncomfortable at times in own learning to empathise with students. • Expressing dissatisfaction with the current system. • What we wear as teachers can be a barrier. • Wanting adults to show more vulnerability • Encouraging a questioning approach that's modelled by adults	Teachers as the change
• Scaffolding seen as increased independence. • Early repetition leads to better self-esteem. • Taking responsibility for their learning after lots of support	Increased independence

Codes	Themes
Adapted tasks are promoting independence.	(one respondent)

Damaged by the system: Fear of failure

Consistent with views expressed in the first session around the needs of the cohort and the system as a problem there was an expression of concern for what students had lost before attending this setting.

“they’ve lost their confidence in education, haven’t they? By the time they come to us.” Person 2

Alongside this was a different empathy for the past experiences that the researcher hadn’t really picked up with the other two schools. This is well represented by the comment that,

“because all of them have been the one to be removed and that’s where that barrier has come from” person 11.

The researcher notes at his part of the analysis was questioning if the ability to hold the negative event(s) at a distance because they had occurred initially at a different school was helping with an empathic response; epitomising the benefit of a fresh start.

A discussion followed around the need to understand that failure is an important feature of progress that held a large consensus in the group and this was consistent with the motivation and growth mindset research that had been shared with the group at the first meeting.

“we want them to normalise making mistakes” person 1.

SRL is part of my teaching now and future plans.

A point of difference in this discussion to the first meeting was that approaches that were consistent with self-regulated learning were being highlighted by the group that had previously been described as,

“metacognition [...]that would be another country” (Person 4)

Whilst techniques were not currently being explicitly shared with students a positive sign of change between the two sessions was the reference to “making it explicit” by Person 12 who went on to explain how they were going to do that using metacognitive skills in their lessons,

“When you go through teacher training you are almost taught to hide it (cognition and metacognitive strategies)[...] I don’t know about other people, but being explicit about what I am trying to do[...]naming the skills, I think this could be really useful for them.”

Additionally, a teacher picked up on the use of graphic organisers as a tool that they would be incorporating into their support of their form group.

Frustrated with the testing culture

Project work and non-curriculum qualifications were a key part of the offer in this alternative curriculum and teachers were mindful of the value students held in having

a purpose to their learning, “how can it be made more real to us?” that was quoted as feedback from the leaver’s cohort.

The opposite to that was expressed in the frustration that skills couldn’t be developed without the pressure of the exam,

“sometimes it feels like teach to pass a test rather than teach for maths that they’re gonna use for the rest of their lives” person 1.

Teachers as the change

There was a strong theme about change being led by the adults in the discussion that chimed with the workshop content around Dweck’s mindset research (Dweck, 1988), which has often been misrepresented in schools as a job for students but is actually a call for teachers to believe that ability is developed not fixed,

“It’s the most powerful thing I think we can do with our learners is to acknowledge that, you know, it’s about growth, shift their mindset from I always fail to its ok to fail.” Person 8

“I think letting them see that you get things wrong. Letting them know that making a mistake is ok [...] the kids seeing you getting things wrong and you learning from it, I think that is really important.” Person 10

Increased independence (multiple comments by one participant)

One member of staff in school three gave quite detailed descriptions of work that they were doing in English lessons with some prompting from support assistants as to the tools that aligned with SRL approaches. Techniques mentioned included repetition built into the teaching plan, small chunks of content, word banks and writing frames and despite the high level of repetition early on to build confidence, independence was noticed as the outcome following mock exams,

“some of them will automatically say “xx I don’t want to use those writing frames now, I just want to work independently”.

Overall feedback from School three was that a wide range of cognition and metacognition based strategies were in use in the alternate provision and the identified next steps were explaining the theory behind those practices to further engage and empower students to make their own choices to support their study habits in the future,

“with the language, I’m definitely being more...conscious of what I’m saying. And I think I explain my reasoning behind things a bit more now as well [...] I think I’m doing it more and better”.

3.4.6 Overview analysis of three schools.

Quantitative phase.

Table 3.21 shows combined difference scores for all three schools (eight teachers) on the Teacher attitude to self-regulated learning scale (Steinbach & Stoeger, 2016).

Table 3.22 shows combined difference scores across schools for the seven teachers who completed the Teachers sense of self-efficacy scale (Tschannen-Moran & Hoy, 2001). Significant differences for both measures used (*) are highlighted in green when there has been an increase post-workshop and red where there has been a post-workshop decrease in score (at a 95% confidence interval). Five participants' post workshop attitude towards self-regulated learning improved, though only one of those was significant using reliable change index calculations. Three participants had a decrease in attitude towards self-regulated learning, again with only one of those decreases being significant. Strategic implementation and strategic adjustment show the most frequently occurring significant increases in post workshop attitude. Overall 34 of the 64 (53%) scores post workshop had increased to some extent and 14 scores stayed constant leaving 25% of scores as decreasing.

Teachers sense of self-efficacy showed 18 out of the 28 (64%) scores increasing, though only one participant's total sense of self efficacy was significantly increased.

Table 3.21 *Combined Schools Pre and Post Difference* Scores for Teacher Attitude to Self-regulated Learning and Sub-scales (TASRL, Steinbach & Stoeger, 2016)*

TASRL scale	Ppt. 1A Difference	Ppt. 2B Difference	Ppt.2C difference	Ppt. 3A Difference	Ppt.3B Difference	Ppt.3C Difference	Ppt.3E Difference	Ppt.3F Difference
Total TASRL	0.5	-0.18	-0.5	0.03	0.25	0.18	0.21	-0.03
Self-assessment	0.5	0.25	-2.0	0	0	0	0.25	0
Goal setting	0.5	0	-0.5	0	0.5	0	0.5	0.25
Strategic planning	-.25	0.25	0.5	0	0	0.25	-0.5	0.25
Strategic implementation	0.5	0.25	-0.25	0.5	0.25	-0.25	1.0	-0.5
Strategy monitoring	1.25	-1.0	-0.75	0	0.25	0.25	-0.75	-0.5

TASRL scale	Ppt. 1A Difference	Ppt. 2B Difference	Ppt.2C difference	Ppt. 3A Difference	Ppt.3B Difference	Ppt.3C Difference	Ppt.3E Difference	Ppt.3F Difference
Strategy adjustment	1.0	0	-0.5	0.25	0.25	0.75	0.75	0.5
Outcome evaluation	0	0	0	-0.5	0.5	0.25	0.25	0.75

Table 3. 22 *Combined Schools Pre and Post Difference* Scores in Teachers Sense of Self-efficacy Scales and Sub-Scales (TSES, Tschannen-Moran & Hoy, 2001)*

TSES scale	Ppt. 1A	Pt. 2B	Ppt. 2C	Pt. 3A	Ppt. 3B	Ppt. 3C	Ppt. 3E
	Difference	Difference	Difference	Difference	Difference	Difference	Difference
Total TSES	0.5	1.7	-0.2	0.5	0.2	0.2	0.6
Efficacy in student engagement	0	2	-0.5	1	0	1	1
Efficacy in classroom strategies	0.5	2	-0.5	0	1.5	-0.5	1.5
Efficacy in classroom management	1	1	0.5	0.5	-1	-0.5	-0.5

Most commonly occurring significant increases for sense of self-efficacy sub-scales in this short term assessment was for efficacy in classroom practice (three of the seven participants). Whilst only one participant had a significant increase in the sub-scale for student engagement, three other participants scores had non-significant increases beyond fractional changes shown in other scores and two participants for classroom management.

Whilst a confidence level of 95% is commonly used in psychology research, the analysis of multiple sub-scales has increased the chance of a type 1 error (identifying a false positive). This suggests that the identification of statistically significant improvement across 5% of the data points is possible by chance. For this reason, language of 'improved', 'increases' and 'reduction' are used to describe the data rather than statistical significance in the discussion.

Qualitative phase: Bringing together the three schools: what kept coming up?

Figure 3.9 draws together themes highlighted within each school and finds commonalities and overlaps to create a thematic map of themes and overarching themes from the three schools (Appendix DD shows development of thematic map). Bi-directional arrows are used to represent sub-themes that are considered interacting and linked, for example increasing student agency and promoting choice also improves a sense of equity for students and addressed needs that have been identified as specifically relevant during adolescence (Yeager et al., 2018).

All schools in some format expressed the recognition that the workshop content addressed the needs of students that they were holding in mind during the

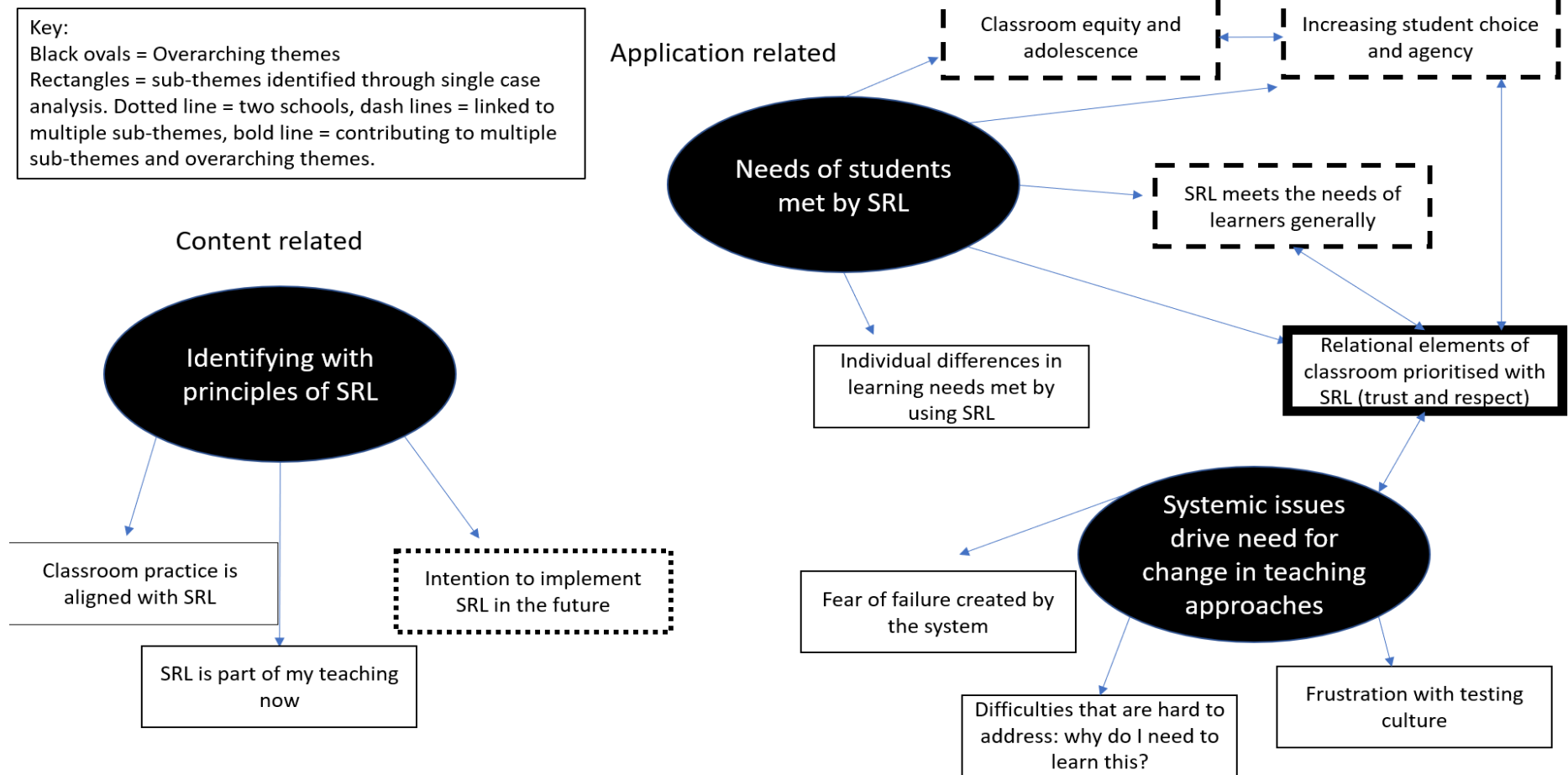
workshops. Questions that came up in the sessions (how would I use this to improve X in my subject area) were linked well to the theory underpinning SRL (Appendix EE). Teachers could identify elements of their current and/or future practice that aligned with SRL. Teachers were also discussing barriers to learning in their classroom that could be addressed to some respect with SRL approaches, such as disengagement of students due to excessive testing or previous experience of failure, as the little and often approaches and the focus on increasing agency appeared to meet the needs of teachers desire to make changes.

Intention for future implementation of SRL techniques and strategies was evident across all three school transcripts (Figure 3.5), even though some comments were tentative, for example expressing a wish to start in September rather than the summer term to have longer to embed (school two). Further evidence for intention to implement was demonstrated by requests from teachers following the workshops or during the workshops for additional resources (e.g. asking for support with how to teach about working memory, school one and expressing a desire for further training, school two).

Additionally, beyond the themes identified the researcher noticed a ‘them and us’ narrative in school one comments where they considered themselves as separate and different to ‘old school’ teachers who were perceived as less relationship focused and more punitive. A similar narrative could be interpreted in the school three discussion where a reference was made to not ‘wearing a suit’ in initial meetings with a young person as a method of disconnecting from mainstream schools. An interesting point of difference that teachers were identifying with was,

although not directly linked to their use of SRL strategies, about the conflict in education identities: what type of teacher am I?

Figure 3. 9 Cross Case Thematic Map



The researcher perceived the issue of not wanting to be ‘boring’ and an ‘exciting versus boring’ construct of being a teacher that came up in school one and school two. When discussing what would be difficult about delivering SRL approaches one comment was a concern regarding,

“making it sound like something that isn’t very dry”

and being concerned about explaining the theory behind techniques,

“ it’s not exactly the most exciting sort of idea is it? (school one).

In school two there was the recognition that not everything the students learnt about was exciting for them,

“...Macbeth can be a bit boring at times (laughs)...”

and that trying out the different approaches was “fun”.

Finally, systemic issues as a theme that was beyond the classroom teachers control gave rise to frustrations, particularly in school two (for e.g. in school two when teachers felt students needed further support with English language learning that curriculum content and in school three where teachers felt the ‘success only’ model of mainstream education let vulnerable pupils down), which could only be partially be addressed by developing effective learning strategies that build positive relationships.

3.5 Discussion

This research explored the experiences of teachers in three schools as they received two workshops on developing self-regulated learning into daily practice across a range of subject specialisms in secondary aged settings in the UK. There was some evidence of small improvements in teacher self-efficacy and teacher attitudes towards self-regulated learning for some of the teachers. Following two workshops on self-regulated learning approaches teachers were able to identify elements of their subject specialism delivery that could be supported by use of SRL strategies and SRL could address difficulties that were raised by teachers in a range of different subject areas supporting the propositions outlined at the start.

To remind the reader of the research hypotheses, propositions and research questions they are repeated below (Figure 3.10).

Figure 3. 10 *Research Hypotheses, Propositions and Research Questions*

Researcher held hypotheses and propositions that informed the research design	Hypotheses: • Teachers sense of self-efficacy will increase when they are given time to reflect on and discuss SRL and time to use with their classes. • Teachers attitudes towards self-regulated learning will change following the workshops. Propositions: • Teachers will be able to describe application and implication to practice of SRL. • Teachers with time to find out about and discuss how to embed SRL into schemes of learning will find it an appealing tool to use in class to improve outcomes.
Research questions	Quantitative – using questionnaire data. • RQ1: does teacher self-reported self-efficacy improve after attending workshops on how to make use of self-regulated learning techniques in the classroom? • RQ2: Does teacher self-reported attitude to self-regulated teaching strategies improve after attending workshops on how to make use of SRL techniques in the classroom? Qualitative – collected from focus group responses. • RQ3a: How much and what parts of the SRL techniques are being used in the lessons by teachers? • RQ3b: How easy do teachers find it to incorporate SRL strategies into their planning?

3.5.1 Research Questions 1 and 2.

Questionnaires that assessed changes pre and post workshops looked at teacher attitudes to self-regulated learning and their sense of self efficacy. There was no overall significant change in either of the scales (using the reliable change index, RCI at 95% confidence interval level), however there were small positive increases in scores on both attitudes towards self-regulation and teachers sense of self-efficacy. The type of engagement experienced by the researcher and the willingness to participate in the focus groups demonstrates a good level of self-efficacy was already established by those teachers as Yildizli (2019) described teachers with low self-efficacy as:

“preferring to avoid trying harder to help students achieve learning goals...they do not do sufficient self-reflection on their teaching practices...”

Some participants were more positively impacted by the workshops than others with the participant from School one demonstrating (at the 95% confidence level) post-workshop improvements in overall attitude toward self-regulated learning. Strategic implementation and strategy adjustment were areas of larger post workshop increases in scores for three of the eight teachers demonstrating the importance those teachers held following the workshop for involving students in the planning and making changes to their approaches using feedback. One interpretation of changes in those particular sub-scales, is that when change has occurred post-workshop it has impacted teachers in areas that promote adjustment of their own teaching strategies in light of student's needs. 53% of scores increased overall and in other

research future action regarding SRL has been linked to higher scores (Steinbach & Stoeger, 2016).

Increased post workshops scores for the sub-scale of 'Efficacy in classroom strategies' was an encouraging finding for three of the seven teachers. This sub-scale is relevant as it is the action focused interpretation of what tools teachers can make use of, which was the focus for this research. Whilst total sense of self-efficacy scores demonstrated mainly small increases, it was comforting to see that only one participant had a slightly decreased overall difference as self-efficacy is linked to both teacher wellbeing and student outcomes (Strahan nee Brown, et al., 2019; Zee & Koomin, 2016). As mentioned in the introduction increasing self-efficacy and therefore potentially increasing wellbeing within the profession in an important goal for those supporting education staff to reduce the high staff turnover in schools. Karlen et al. (2020) differentiate between content knowledge and pedagogical content knowledge and these workshops appear to support the process of using content knowledge with effective processes related to SRL.

Changes to teachers post workshop scale data were not consistent across the teachers that participated, demonstrating there was no one common response to workshop participation or level of engagement with the process. Additionally, pre scores on the teachers attitudes to SRL scale showed raw scores at 141 out of a possible total of 168. It is possible that those engaged in the workshops and completing the scales were more interested initially in the concepts underpinning the workshop generally.

3.5.2 Research Questions 3 and 4.

Teachers across all groups were able to think of examples of where they had made use of metacognitive approaches either during the workshops or whilst attending the focus group. Consistent with other findings, teachers who attended the sessions were supportive of the use of SRL (Karlen et al., 2020).

There was a consensus that cognitive theories were being used to underpin strategies used in class (such as chunking information, repetition and rehearsal), as would be expected as SRL strategies have been promoted since the 1980's (Dent & Koenka, 2016). What appeared less common was for these teachers to share cognition theories with the students and explain why the teaching or revising strategies were likely to be effective based on theory. This is a key element of instructional psychology that can support students to apply skills more broadly rather than focusing on the removal of students for individual support (Solity, 2020; Ward et al., 2017).

Teachers referred to systemic issues, such as the inflexibility of the UK education system, that could impact their ability to work effectively with students around self-regulated learning. One example is where students may have benefited from SRL through additional language support rather than subject content and are, therefore, not in the appropriate classroom context to make best use of SRL. School two identified the challenge of trying to apply instructional practice in general to older students (15 and 16 year olds) who had recently arrived in England and had English as an additional language (EAL) and were working at the social language level

(Basic Interpersonal Communication Skills, Cummins, 1984). Those teachers identified an issue around equity of educational benefits as these students needed greater support transferring their first language skills to language two (Cummins, 1984; 2000) but system level barriers led these students to being assessed at an academic level (Cognitive Academic Language Proficiency, Cummins, 1984) in year 11. Siblings arriving in year 8 or 9 were described as better placed to receive academic support in years 10 and 11 as their academic language in language 2 had developed.

Reassuringly, no teachers attending the follow-up sessions raised specific difficulties with taking SRL strategies and adapting them for their own subject area. In School one and two at workshop one, discussions were around, “how would I do that with X teaching material” and teachers were open to problem-solve, feeding back that it was helpful during the workshops to have time to think about and discuss specific problem areas of their course to target.

A difference with school three, was teachers needed more time to reflect on the demands they faced and demonstrated a need for the researcher to be aware of the challenges faced by them in engaging learners during workshop 1 before discussion of classroom learning strategies in workshop 2. The researcher perceived this as a need to tell their stories, in the context of what is highly sensitive work working within an alternate provision context. Given time to reflect staff moved from ‘our students don’t do XYZ’ responses to having detailed discussions about where SRL already existed within their highly adapted practice.

An issue raised by teachers across schools was that students struggled to apply themselves to learning content that they considered irrelevant to their life. This came up in subjects such as Maths, Modern Foreign Languages, Religious Education and for specific parts of English, such as text analysis and poetry. Two schools during discussions acknowledged that SRL principles helped support a skill-based approach to delivering subject content. In particular sharing information about how you learn (cognition) was thought to be received well by students by providing a rationale for engagement; 'I am learning how to learn' as opposed to 'I am learning content that I am not interested in'. Whilst this was not considered a panacea for all disengagement, it was reported that for some students having a greater understanding of, for example, their working memory could be used to help them select study skills and increased their agency as learners. Increasing student's understanding and use of cognitive strategies links to the role of the EP directly as involvement in post-16 preparing for adulthood, includes preparing for employability. Problem solving skills such as thinking creatively to solve problems, reflecting on learning and flexible thinking were highlighted in a review of employability skills (Stanley-Duke & Stringer, 2017) and are relevant to the development of SRL skills.

The researcher views were that a strength of having a focus on self-regulated learning was that it promotes teachers spending time investigating with students what helps learning for them. The by-product of working on SRL skills is that the focus is always on the demands of the task and reflecting on what the student has learnt, how it can be used in future; which diverts from the content and reflects a philosophy that we are learning how to learn rather than learning this content

specifically. The task focused approach to working with young people is also consistent with Geddes (2006) application of attachment theory to the classroom. In the example of avoidant attachment, for some learners it is less antagonist to focus on the task than on the relationship with the adult, which the researcher reflected could explain why teachers had a positive experience using the approach with their students. The relational elements of building self-regulated learners (collaborative problem-solving is a key component in SRL) was acknowledged which is important to self-esteem and critical thinking skills (Cornelius-White, 2007).

Task rather than person-focused conversations also address developmentally appropriate requirements of teaching adolescents, reducing any potential for shame and embarrassment in front of peers (Yeager et al., 2018). Adapting the task to make it appropriate for the learner is more respectful than suggesting the person is not able to complete the task ('let's break this down into different parts' rather than 'here is a different task'). Additionally, this perspective is also aligned with growth mindset principles (Dweck, 1988).

An issue discussed regarding inheriting students who in primary school had had Velcro style support that had depleted the student's independence was picked up by the researcher as it chimed with findings from previous research regarding the reduced progress of students who have increased levels of teaching assistant support (Blatchford et al., 2012). It also is hopefully being addressed with the wave of educational psychology service developments such as ELSA (Emotional Literacy Support Assistant, Burton, 2008) and MELSA (Mediated Learning Support Assistant,

Stanley-Duke et al., 2022) initiatives that aim to upskill teaching assistants to provide evidence based and structured support. Normalising academic challenge has also been suggested as one of the SRL's strategies missing from teacher self-reports of what they make use of in class (Callan et al., 2020).

Generally, teachers felt that SRL principles supported students with additional needs and the approaches that teachers trialled around providing more structure appeared to benefit student's independence in the classroom to complete a task, the impact of metacognition and SRL on independence is supported in other literature (Stanley-Duke et al., 2022). In summary self-regulated learning principles were well received by teachers to meet the needs of varying levels of academic ability.

The research hypothesis held by the researcher that teachers sense of self efficacy and attitudes towards self-regulated learning were partially met from this analysis. The propositions that time spent considering SRL strategies would lead to teachers being able to describe applications within their own subject specialism was evidenced through teacher discussions in the sessions. There was a sense from each school that the approach to teaching represented by SRL principles was an appealing and flexible tool, useful across a range of learning situations.

Due to difficulties with recruitment, school two and three were both recruited from teachers attending training as part of their directed time, this was not ideal and raised the concern that teachers would less invested to use and feedback on the processes; feeling under duress to participate. Indeed, to assess the perceived

usefulness of the workshops a training evaluation form was given to school two after workshop 2 and feedback was positive (Appendix AA). Whilst a few teachers did not participate verbally in the workshops (potentially disengaged due to directed element of attendance), in both schools there was enthusiasm and buy in from most teachers, who then contributed to the focus group conversations. The research has not fully captured the views of those who found the workshops less helpful or the reasons why they may have not engaged with the materials.

Teachers that did not engage with the focus group or choose not to attend follow up workshops may do so for a range of reasons, including philosophical beliefs regarding education, which are hypothesised as anywhere between two extremes described below. Staff may find SRL strategies unappealing if they ascribe to within-pupil view of difficulties that the student needs to change or is the problem (e.g. students need to try harder), as this may reduce their perception of a need to adapt their delivery. Conversely, it has been suggested to this researcher (discussion with peers on the Doctorate training course), that the label of 'self'-regulated learner may *imply* a within-child approach to some readers that may conflict with philosophical beliefs. This led the researcher to wonder if SRL had a PR problem and highlights the challenge of getting evidence-based approaches widely known and into schools without dilution and losing something in the translation to practice. In this respect a limitation is that this research did not seek out teachers' perspectives regarding views on educational philosophy more broadly and links to a point that was raised by Kramarski & Heaysman (2021) regarding whether the teacher is a self-regulated learner themselves.

It is important to reflect on the multiple reasons why in School one only one member of staff attended the second session around motivation as high attrition rates in research is associated with low acceptability. Practical reasons, such as workload and competing demands for time after school (including mock marking in the summer term) may have impacted availability of staff. Certainly, all the communication to the researcher regarding non-attendance at workshop two related to time concerns or clashing with other obligations. A recorded version was sent to staff to increase flexibility around when the workshop content was viewed and was not made use of. Additionally, a sense that the workshop was not benefitting their professional development may also have impacted some. Whilst it was emphasised that hearing all views on the training was equally helpful, in a busy school environment it is hard for staff to commit time to view and feedback back on a workshop if they were not interested or felt it was not relevant to them.

Consequently, what was missing from the data was the voice of those who had not made use of the self-regulated learning, as the focus groups and discussions contained the voices of those who had made use of strategies or could identify in their practice self-regulated learning approaches. It is clear that some teachers' views were not captured in the process. That some codes were not matching on the pre and post questionnaires may also reflect concerns about being identified in the research process. It may also reflect a complexity around how the codes were asked to be set up. A limitation with the use of online surveys over in-person completion is that the researcher is not available for guidance on how to set them up.

The feedback received and comments made were provided by those who were supportive of the ideas and processes and this may reflect the difficulty delivering the workshop and asking for people to feedback, as it may be harder for participants to point out things they did not like directly to the researcher who had delivered and designed the content. Giving examples from the researchers own previous Psychology teaching practice to illustrate strategies and how they could be used and adapted may have made the presentation personal and the researcher reflected on the impact this may have had on feedback. Conversely it may have built up credibility levels to have clear examples of challenging situations to relay to teachers.

3.5.3 Limitations of the research.

Other researchers have highlighted the need for teachers to have their own skills regarding self-regulated learning prior to developing teacher and student focused self-regulated teaching skills (Karlen et al., 2020; Kramarski & Heaysman, 2021). This factor of 'teacher readiness' is important to consider in future research assessing the impact of interventions, as opposed to looking purely at student academic outcomes (Kramarski & Heaysman, 2021). This element was not assessed in this research. In future research individual interviews pre and post workshop delivery may have picked up more clearly teachers espoused views about their sense that they can change young people's outcomes and affect performance.

The use of the questionnaires to capture changes in a relatively short time between pre and post assessment was a limitation. Ongoing reflection and adjustment through additional cycles of planning work in class could have led to further change

over time as has been suggested by other evaluations of effective implementation practice (MacMahon et al., 2022). Likewise, teacher self-efficacy and attitudinal change may have been captured more effectively through individual interviews rather than questionnaires, where teachers can become easily bored or inaccurately complete them (Yildizli, 2019) due to time pressures.

Whilst the training workshops were underpinned by effective principles of adult learning (PALS, Dunst & Trivette, 2006) the actual delivery and timings of the sessions were impacted by practical limitations in each school setting. A clear limitation of this process is that not all settings had the planned approach of workshop one, practice implementation, workshop two followed by focus group evaluation within a specified timeline (Table 3.6). Delivery had to be adapted for each setting dependent on time allocated by the school for CPD and teachers' commitment to the process whilst juggling demands of the job.

Stanley-Duke et al. (2022) highlight the 'mediation' skills needed to deliver self-regulated learning strategies into classroom practice effectively and this was not included formally into the workshops delivered as part of this research. Mediation was discussed informally as part of the 'how' SRL principles would be implemented but a limitation of this current workshop approach is that without the follow up to support sensitive mediation of the strategies it would be challenging for teachers to adapt their practice fully.

The area of self-regulated learning is so broad that a thesis on one of the three individual components alone would have been possible. As a result, the reduction of each component of SRL to ensure breadth of coverage for these workshops may undersell the complexities contained within the research underpinning SRL. This difficulty can be highlighted by the cognitive load theory, that has been conceptualised here as a singular concept, but is well explained as a multitude of effects numbering up to seventeen (see Sweller et al., 2019 for a summary). Participants in the workshops were made aware of this fact during the workshops.

3.5.4 Strengths of the study.

The research presented here demonstrates that developing workshops on self-regulated learning using a 'knowledge-broker' approach (to supporting teachers applying the strategies to their subject areas) was an effective way to address concerns raised by subject specialists in secondary schools that related to learning and cognition. Teachers were also able to identify practice examples of where they already were using SRL strategies and highlighted that making this explicit to students was a helpful next step. Feedback from the workshops suggests that this experience has had a beneficial impact on the self-efficacy of teachers to deliver SRL focused teaching and this in turn has the potential to impact the students in those three schools to experience success and competence as students and become lifelong independent learners.

Initially the intention was to recruit volunteer teachers from each setting to ensure that teachers were engaged and committed to the idea of making use of SRL.

However, reassuringly from the example of School two and three that were directed to attend the sessions, a range of people contributed to the focus group discussions (for example 10 out of the 15 at School three). In each session the detailed conversations about adapting practice to support the learning of course content more effectively supported the usefulness of the workshops for some teachers that numerical data regarding attendance and questionnaire data alone would not reflect. The researcher made use of discussions in both workshops to provide further information and signpost to resources that would support their ongoing CPD around SRL.

On the whole teacher comments during the workshop sessions reassured that the content was directly and immediately useful to their teaching practice and applicable across the range of subject areas represented. In each session teachers asked subject specific questions about how they could adapt cognitive and metacognitive strategies mentioned to their own teaching content. Self-regulated learning and the development of student's awareness of metacognitive skills supports study skills and learning outcomes (Wang et al., 2012). The analysis of teachers' feedback suggest that having had time to think about self-regulated learning and reflect on how it might be used or is already in use in their classrooms, teachers found it to be helpful and relevant to their regular classroom practice. This was particularly useful with school three and is worth highlighting that teachers in an alternate provision may need more time in training sessions to share their teaching experiences and feel confident the trainer is taking their context into account.

Focus groups produced both a rich discussion and supported the schools in starting the collaboration process and sharing ideas, which is why this process was considered an appropriate method of triangulating the attitudes towards self-regulated learning scale data. Designing the process to maximise the usefulness of the contact time with busy staff was an important ethical concern to this researcher, especially in the context of thirty hours of contact time with teachers being discussed in one approach to developing SRL with teachers (Kramarski & Heaysman, 2021).

Implications for future practice: School focus.

Teachers who have found SRL techniques useful in their own learning experiences are more likely to promote those strategies with their classes (Karlen et al., 2020). Kramarski and Heaysman (2021) suggest that a 'triple SRL-SRT' process is useful framework for developing SRL approaches with teachers. A strength of this research is that all three elements suggested by Kramarski and Heaysman were evident in this shorter programme of teacher CPD;

- making use of SRL as a learner (the workshops were designed to model SRL strategies such as chunking, reviewing knowledge and planning next steps),
- knowledge sharing around SRL (workshop content),
- allocating time for teachers to apply the theory to their subject areas specifically.

Schools may find it useful to identify where SRL strategies can be made use of during CPD and line management processes to embed the theoretical roots and

increase the likelihood of SRL being used in class. In particular, just as students with a fixed mindset are less likely to persist against challenge, it is equally important that teachers reflect on how they convey a growth mindset across a range of situations to support student motivation (Karlen et al., 2020) and what their philosophical views are, as these are shown to impact use of SRL (MacMahon et al., 2022). Developing an awareness of how powerful teacher attributions can be on students can be impactful (Weiner 1972); teachers who believe that students can alter their outcome trajectory are more likely to promote SRL strategies.

In light of both its usefulness to teaching staff and evidence-based around improving academic outcomes for students, schools may want to consider the use of metacognitive questionnaires with their students. An advantage of identifying level of metacognitive skills students have, is that lower levels of skills have been found to correlate, for example, with higher anxiety in maths that reduces when skills are developed in a group with specific learning difficulties (Wang et al., 2021). This suggests that identifying metacognitive levels may also overlap with whole school approaches to supporting wellbeing initiatives. This wider finding was echoed in this research, for example from individual reflections that a student with additional needs enjoyed a lesson using clearly structured tasks to independently work through. Leading to reflections around potential accidental de-skilling of pupils with additional needs when they have received a lot of additional adult support.

The transition to secondary is significant for all pupils and some students with additional learning needs may benefit from the study skills that are promoted by self-

regulated learning principles to support their increased independence and maximise potential feelings of self-efficacy. Addressing negative attributions about learning (Weiner, 1972), when using SRL strategies directly with students, through for example attribution retraining, has been shown to have higher effect sizes than a focus on learning skills alone (Berkeley, 2011). In this respect a strength of this research is that the workshops could, in future, be adapted to target year 6 and year 7 teaching to address transitional barriers and build consistent study skills that support a positive experience of learning during handover from key stage 2 to 3.

A further strength of participating in the self-regulated learning workshops were teacher reported impact for learners with additional needs that led to greater levels of independence and confidence in classwork. Feedback from some teachers was that they were accustomed to having a 'teach to the top' approach ordinarily. One group of four teachers setting their first targets together in workshop one acknowledged that the focus on cognition had helped them to think about adjustments for the lower ability students in their classes. This suggests the workshops may have raised the profile of those learners with additional needs, which is a positive outcome that would benefit from further exploration.

Teachers appeared to benefit from dedicated time to focus on the principles of self-regulated learning and how implications for different learners (Dunst & Trivette, 2006; MacMahon et al., 2022). Teaching to the "top end" may not have as many negative implications in a low PP setting, where there is less social diversity and people have access to resources such as additional tutoring. However, taking a

'teach to the top' approach in a high PP school could disproportionately impact learners in socially diverse settings leaving families feeling that the responsibility to learn is solely with them, "you choose not to learn" whilst accessing fewer personal resources that support learning beyond the classroom (such as working space at home and access to IT other than on a phone) that makes a low level of instructional support for studying problematic. Do we assume some students are not open to teacher support when it may be due to the mode of the support and how it is perceived? The concept of 'teach to the top' in itself is interesting to reflect on and how it may increase in a systemic context of increased focus on academic outcomes over skill development. An intervention focused on improving SRL strategy use in primary aged students categorised as having a low social economic status (SES) found that SRL competence improved (Azevado, et al., 2022). Poverty is suggested to hinder the development of SRL competence and bring children into the school system with fewer cognitive skills at the start of their educational journey, Azevado's et al. (2022) findings demonstrate that the impact of SES status on cognitive skills is not deterministic. The use of narrative based primary SRL intervention was suggested as a tool to reduce the skill gap and improve ability to focus, shifting attention and inhibition of behaviours (Azevado et al., 2022).

Educational psychologist focus.

Making use of an instructional approach to tackle differences in learning outcomes has been championed by those who feel that designating special educational needs as a separate domain to effective whole class teaching is misguided use of EP time

(Solity, 2017) that could be spent improving the outcomes for all learners. EP's, it has been suggested could make use of classroom observations to feedback on what strategies have been observed and promote other strategies in schools (Callan et al., 2022). Likewise, embedding SRL into training programmes and providing opportunities for teachers to reflect on their successful use of SRL as learners can act to increase the future use of SRL by teachers (Karlen et al., 2020). It is an opportunity to challenge unhelpful attributions regarding student disengagement in learning and re-frame challenging classroom behaviour as 'finding learning hard'. SRL theory and related strategies are suggested as ideally placed for educational psychologists to unpick and analyse learner behaviours that can lead to effective interventions (Zimmerman, 1989).

This research supports the perspective that systemic change for students with additional needs is an evidence-informed approach that can be part of EPS service delivery. Since designing this research project, the researcher has become aware of processes underpinning training programmes such as ELSA (Burton, 2008) and MeLSA (Stanley-Duke et al., 2022), that harness instructional psychology and implementation science (for example, Rosenshine, 2012) to inform decisions around delivery, as this research has done by using the theoretical underpinnings of PALS (Dunst & Trivette, 2006) . The ELSA and MeLSA programmes require trainee commitment to six days of training over a year and further supervision to discuss application; an ideal way of embedding practice into schools with external services support. School two had three points of contact with the researcher and teachers were still keen in their feedback to receive follow up support (Table 3.9),

demonstrating a need to continue to support beyond initial training to foster a sense of self-efficacy and mastery. This researcher recommends inviting reflection on practice and having more than one contact time with teachers to allow teachers to take ideas from the workshop and think about them in their actual practice.

The small workshop approach to training was a positive experience for this researcher. Karlen et al. (2020) found that teachers' content knowledge of SRL was not as effective predictor of their use of SRL strategies in class as pedagogical knowledge of SRL. Providing space for teachers to identify and ask questions about how the theory linked to their practice led to high levels of engagement during the sessions. As the researcher asked for feedback on how teachers felt SRL applied to their subject or lessons, this led to teachers being open about what they did not feel was appropriate and raised misconceptions, at which point further clarification and discussion could take place. The researcher also felt able to use a problem-solving approach when faced with 'that wouldn't work for X' or 'what do you do about Y' in this workshop context that may not have been possible in a more formal direct delivery style training. This process identified resources to send post-workshops as a follow up to support embedding of specific approaches (Appendix V). This could act as an alternative to a follow up visit and may have increased the amount of time teachers felt supported and lead to increased levels of self-efficacy. Due to high levels of service demands, EPs can find additional follow up visits to support with embedding changes challenging; alternative approaches to 'keeping in touch' can, therefore, be helpful. The triple SRL-SRT approach outlined by Kramarski and Heaysman (2021) would be a helpful tool for EPs considering delivering SRL training

to schools and the three elements that they highlight as being essential components are which were mentioned earlier and included more than one moment of contact with teachers.

The ‘tell me what you think about...’ approach to presenting workshop content led to opportunities for in-depth discussion during the workshops and cross departmental sharing of ideas. Interestingly this led to change in School three’s perspectives as at workshop 1 they identified as a group that the ‘motivation’ section was more appropriate to their setting. However, in their later reflections as part of the combined workshop 2 and focus group session many teachers linked their examples of classroom practice to the cognition and metacognition elements of their practice. Understandably when teachers are working with the most vulnerable students in the education system, their analysis of learning by breaking tasks down into tiny parts and scaffolding learning exists as a core part of their offer and is perceived as integral to building relationships. Whilst reporting a preference to focus on motivational elements, staff were recognising and relating to learning focused aspects of the model in their reflections.

A key issue for EPs to highlight when discussing ‘disengaged’ learners with schools is the inter-connected nature of the three elements of SRL. When students understand more about cognition and how it relates to the task at hand and have strategies they perceive as effective to tackle tasks (metacognition) they will inherently develop more engaged and motivated attitudes to their work. Attribution theories can help to explain this, with a sense of collective ‘learned helplessness’

perceived in the group of students that have not been able to find success in the mainstream educational system that has impacted their ability to mobilise themselves as learners (Weiner, 1972); their experience has not been that effort leads to more positive outcomes. The challenge in an alternative provision may not be whether SRL will work, as there is evidence to support its effective use to increase re-engagement beyond mainstream (Putwain et al., 2016), but rather the time it takes to embed whilst building up trust and positive experiences for young people to secure engagement initially and in time for end of key stage assessment. Clearly introducing this approach more consistently across mainstream settings could reduce the breakdown in that relationship in the first place.

Ward et al. (2017) provide a model of how EP's can move service delivery away from individual assessment work supporting whole class instruction using the wealth of knowledge that has been developed on instructional psychology in a primary context. When questioning the effectiveness of one to one teaching and small group interventions (Blatchford et al., 2012; Hattie, 2012) a concern has been how to replace these approaches to supporting learners with more effective education (Radford et al., 2014). Ward et al., (2017) acknowledge the delivery of the support also has to model core principles of instructional psychology and the hierarchy of learning and as such distributed practice (multiple visits to promote fluency and accuracy), which may prove challenging in the current climate that EP's are working within.

Increasing student's understanding and use of cognitive and metacognitive strategies links to the role of the EP directly as involvement in post-16 preparing for adulthood, includes preparing for employability. Problem solving skills such as thinking creatively to solve problems, reflecting on learning and flexible thinking were highlighted in a review of employability skills (Stanley-Duke & Stringer, 2017) and are relevant to the development of SRL skills.

Additionally, educational psychologists will find SRL approaches align with a multitude of other areas of their work. In particular a consistency was noticed by this researcher with the underpinning principles of dynamic assessment (for example Feuerstein's mediated learning experience, 1985), where cognitive and affective principles of learning are highlighted as part of the assessment process and the role of the EP is to facilitate identification of how learning can be successfully mediated to foster a sense of competency. EP's will also recognise the close links between metacognitive and executive functioning skill development (Roebbers & Feurer, 2015) highlighting that promoting SRL whole class strategies is an efficient way to support vulnerable learners.

3.5.5 Future research.

This research did not intend collect directly the perspective of students. Longitudinal research following students across their key stage four learning journey using interviews would be a fascinating insight into the service user's perspective of an SRL informed teaching focus. Perkins (1992) suggested there were four levels of metacognitive learners; tacit, aware, strategic and reflective. In future research it

would be interesting to introduce these four levels to students and teachers alongside implementation of a self-regulated learning focus to ascertain whether referring to this model would further enhance reflective practice around study skills.

Whilst SRL was generally received well, an important group highlighted were those students with English as an Additional Language (EAL) students entering the education system at the start of key stage four, where there was a perceived limitation to the use of instructional strategies. There is little research on what works in secondary schools that reflects characteristics of the wider community context that students exist in when assessing impact on academic outcomes. An interesting question for further research is whether there is a need for students joining the UK education system at the end of Key stage 4 with English as an additional language to have assessments in their first language for core subjects to reduce the initial impact on their future life choices? Additional language support rather than participation in a wider non-core curriculum offer may improve EAL students access to helpful instructional strategies.

An area for future research that this researcher has been reflecting on is issue of professional language use. Does language at times present a conceptual barrier? For example, language adopted by 'cognitive science' such as 'interleaving' and 'spacing', may be unpalatable for some teachers for whom teaching is a responsive craft and the language being used may be conjuring images of a behaviourist and scientific approach to learning that may not align with some teachers views of their professional identity. In this research language was intentionally framed to increase

acceptability for a student audience, as one of the goals was to increase the sharing of strategic study information between teachers and students. For example, 'interleaving' was re-framed as returning to linked topics to support students to see conceptual links across the course and develop schemas. 'Spacing' was describe in action, for example, revisiting key content at the start of subsequent lessons to increase repetition over time as opposed to within a lesson. This may be an attractive approach for some teachers and less appealing for teachers with a professional identify that does align with scientist practitioner, who may have found this approach undermining their professional identify. As most previous SRL research has been carried out with core subjects (English, Maths and Science) there may be differences in the ontological positions of other subject specialists that, if considered when developing staff training, would help to align training appropriately with the professional identify of the staff. An interesting question that the researcher was left with was whether some teaching and learning initiatives created language barriers that acted as additional cognitive load to teachers and support staff and muddled the water of the purpose of the strategies for the student. It would be helpful to gain teachers perspectives on this hypothesis and whether training can be more effective when using teaching preferred language rather than transferring researcher language into teachers workplace.

A linked question is whether researchers in educational theory and practice need to address this issue at source to ensure the practical strategies that are beneficial to learners are effectively crossing the divide from research into practice. An enhancement to a positivist confirmation that an approach is theoretically sound is

demonstrating it can be adapted into daily practice in real world settings. No 'effective strategy' is effective if teachers are not able to identify with the purpose and benefit of it and have time to apply it to their subject area and see the benefits to their students. A number of potential barriers including teacher's perceptions and current knowledge of SRL have been suggested (Callan et al., 2022; Kramarski & Heasyman, 2021). Clearly this point does overlook the challenging systemic context of large curriculum content alongside outcome focused performativity goals that challenges the adaptability of our teaching populations currently in the UK. There is a conflict for teachers in retaining the 'process' focus of SRL when the system requires them to monitor and report outcome data. With decades of supporting evidence of the impact of SRL and its multiple iterations what does need to change in order to incorporate this collaborative problem solving approach to learning consistently into classroom practice?

From the final analysis incorporating all three schools' perspectives (Figure 3.9) the researcher reflects that there is a visually depicted divide in the over-arching themes between 'Identifying with the principles of SRL' and the themes that are more interconnected; 'Needs of students met by SRL' and 'Systemic issues creates need for change in teaching methods'. The difference between a teacher's professional competence in delivering SRL strategies and their ability to act as agents of SRL (Karlen et al., 2020) could be illustrated by this divide. The standalone theme could be representing the internalised alignment with SRL principles with the two interconnected themes representing the externalised actions related to that knowledge, which could be associated with increased likelihood to make use of SRL.

This would be an interesting area to investigate further and as previously mentioned the use of interviews prior to and post workshops could help to assess if receptiveness to training was related to the pedagogical application of knowledge or was pre-existing for those interested in the workshop materials.

In summary.

This study brought together theoretically informed approaches to teaching and learning and demonstrated workshops linked to the three key principles of SRL (cognition, metacognition and motivation) could address issues raised by teachers as barriers to learning across core and non-core subject areas (Appendix EE) .

The workshop materials are a resource that can be used in future training with teaching staff with confidence that it was received well and serves as a comprehensive first stage in developing the capacity of staff to focus on self-regulated learners in a secondary school context.

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Chapter 4: Dissemination and Impact

4.1 Introduction.

This chapter includes a discussion of the concepts of evidence-based practice and practice-based evidence with respect to how they link to the approaches used by the researcher in this thesis. Following this discussion is an overview of implications for the research presented in terms of academic, professional and social potential areas of impact. Effective dissemination of research is explored using the three forms of knowledge transfer activity highlighted by Lomas (diffusion, dissemination and implementation, 1993). This chapter concludes with a detailed plan for sharing the findings of this thesis and publishing papers.

4.2 Exploring the concepts of Evidence-based practice and Practice-based evidence.

Defining Evidence-based practice (EBP).

EBP includes randomised control trials and single case experimental designs that demonstrate evidence of an intervention working through highly controlled practices with outcomes data that can be collected through meta-analysis (Barker et al., 2016). For example, educational research may take place as an intervention trial outside of the classroom environment or in school but with a researcher leading the intervention. EBP is therefore often carried out within the positivist framework, valuing objective research methods that support claims regarding external validity and reliability (Moon & Blackman, 2014). To assess how effective an intervention is Petticrew and Roberts (2003), suggest that randomised control trials, cohort studies and quasi-experimental research are included in any assessment of effectiveness.

A limitation with EBP is that it does not consider the complexities of the natural environment, which may reduce the likelihood of the findings being generalised or the intervention being maintained once out of the more controlled setting. In extreme cases the impact of the intervention may have been the result of the change in adult rather than the intervention itself.

Defining practice-based evidence.

Practice-based evidence is evidence from an intervention in situ (occurring in the natural environment of the target behaviour, situation or task) and values internal validity (Barker et al., 2016). A limitation is that other settings and context may feel that there are situational factors that have been part of the process that therefore account for the outcomes. This would suggest interventions may be less likely to generalise elsewhere. Though a benefit is that others can see that it is possible to carry out the intervention in the targeted environment. This research is therefore more likely to be aligned with constructionist philosophy that generates contextual understanding (Moon & Blackman, 2014).

The empirical paper in this thesis aligns with the five criteria suggested by Kratochwill et al. (2012), regarding ensuring that evidence-based knowledge can be embedded into practice (Table 4.1). Initially a review of the literature from a positivist perspective, including the use of randomised control trials (RCT's) and single case experimental designs (SCED's) was carried out and described in Chapter two. This confirmed that there was an evidence-base for the use of self-regulated learning

interventions and strategies to improve academic outcomes for students at secondary school level with additional learning needs (learning disabilities).

Rationale for dissemination.

A huge body of evidence is generated each year through academic and practitioner research (evidence-based knowledge), however, in practice-based fields (such as teaching) what is the impact of those findings? Whilst it is vital that approaches promoted for use in education have been shown to be effective at improving outcomes for young people, a difficulty exists that extending knowledge is not always combined with clear application in a wide range of contexts. Findings must be applicable to the complex systemic context that schools exist within.

Figure 4.1 (Fixsen et al., 2005) illustrates one conceptualisation of implementation science, which involves the process of ensuring that both ‘what’ is helpful and ‘how’ best to implement are being considered when delivering research findings into school contexts. This model suggests six stages that can be used to consider the individual, group and system level planning that needs to take place to embed a new intervention or initiative into a school environment. Fixsen et al. (2005) highlight that only at full implementation of the process would we be able to expect outcome changes.

Table 4. 1 *Table Considering the Kratochwill et al., (2012) Criteria Against the Actions Taken to Carry out the Research Activities Outlined in Chapter 2 and 3*

Criteria suggested by Kratochwill et al., (2012).	Applicability of the criteria to chapter 2 and 3..
(a) systematic evidence searching and adoption of evidence-based prevention and intervention practices.	• In Chapter 2 a review of the literature has been carried out using a systematic method to answer the review question. • Framework used to design the empirical paper (Tong et al., 2007).
(b) implementation and adherence to intervention integrity.	• In chapter 2: Use of Weight of evidence A assessments appropriate for RCT* (Gersten et al., 2005) and SCED*'s (Horner et al., 2005) as suggested by Gough (2007).
(c) invoking standards for drawing inferences from interventions.	• The use of common effects sizes in chapter 2 and reliable change index (Jacobson et al., 1984) in chapter 3 prevents conclusions being drawn from data that can't be supported. • In Chapter 3 detailed information is provided regarding the reflexive TA (Braun & Clarke, 2013) undertaken, such that other researchers can assess the effectiveness of the inferences made.

(d) using quality assessments to measure outcomes.

- Use of validated scales in chapter 3 questionnaires.

(e) adopting formal data analysis procedures to assess intervention outcomes.

- In chapter 2 RCT* and SCED* studies were used to compare effect sizes across research.
- In chapter 3 pre and post data was considered using reliable change index to detect significance change in teachers views on attitudes towards self-regulated learning and self-efficacy.
- Bishop et al. (2104) framework used for teacher self-reports of fidelity of intervention use.
- Reflexive thematic analysis procedure (Braun & Clarke, 2013).

*RCD = Randomised control trial. *SCED = Single case experimental design.

To this end, Chapter three in this thesis then explores the practice-based acceptability, by teachers, of making use of self-regulated learning strategies as part of curriculum delivery. If teachers cannot embed concepts into their practice due to other competing demands the effectiveness shown in RCT's will demonstrate a lack of ecological validity. The empirical paper provided a voice for teachers to articulate what systemic and contextual factors may impact their adoption of SRL. As suggested by Shaw & Pesci (2021), part of implementation science is the ability to assess whether the intended audience is receptive to the transfer of knowledge into practice.

Whilst for this researcher the process represents stage one of implementation, where the workshops helped to identify that SRL could address the perceived needs of teachers, in the wider picture of SRL theory and practice research the education system as a whole may consider itself to be at stage 5 or 6. The implementation process is then dependent on perspective and what level of impact that a researcher aims to have (implementation within a class, a school, a local authority area). To facilitate change at multiple levels within the system (stage 3) this researcher will need to develop resources and work within a supportive organisation to continue to implement SRL strategies into local schools and help schools and teachers to adapt to their individual settings. To facilitate change within a vast organisation, such as the UK education system, small steps and local change may be more practical to build towards whole system influence in the longer term.

Figure 4. 1 *The Six Stages of Implementation (Fixsen et al., 2005)*

Stage 1: Exploration & adoption	• Identify need. • Acquire information via interactions with others. • Assess the fit between the intervention and needs of school/pupil. • Prepare staff, school and family by mobilizing information and support.
Stage 2: Installation stage	• Preparing for the delivery of the new practice. • All resources prepared. • Consideration to funding, human resources, policies & procedures.
Stage 3: Initial implementation	• Change must occur at multiple levels (e.g., practice level, supervisory level and administrative level) (pupil, practitioner/teacher?) • Typically, this change is met with much anxiety and at times, resistance. • Missteps may occur. • A supportive organisational environment key to success.
Stage 4: Full implementation	• New learning is integrated into practitioner • The destination (new program) should approximate that of the source (original program) with fidelity
Stage 5: Innovation	• Some adaptation occurs at destination site (EBI implementation). • Not to be confused with model drift (changes in fundamental principles of EBI). • Innovation retains sufficient fidelity to the model, but adapts to destination site to achieve implementation. Must be monitored to ensure that drift does not occur.

Stage 6:Sustainability	• After initial implementation new program must be maintained with sufficient fidelity to the model. • Turnover of staff must be successfully addressed. • Policies must support sustainability of program including governance and funding. • Must be adaptable to shifting ecology of the environment.
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4.3 Impact of this research

Policy change has already been affected by the body of research that exists around the effectiveness of making use of metacognition and SRL in teaching practice (Department for Education, 2019 and 2021). A range of methods incorporating self-regulated learning and metacognition are being utilised by schools, including student workshops on study skills for year 11 students preparing for end of key stage four public exams and CPD training for staff. However, one off study skills sessions with students often have limited impact (Hattie et al., 1996; Quigley et al., 2019) as where metacognitive knowledge has been picked up by students they are not always able to select the right strategies when given a choice (Bingham et al., 2021). In this researcher's previous role (secondary school teacher teaching a non-core subject) little support was offered to staff on how to translate the theory to subject specialisms (domain specific instruction) with most approaches emanating from research using core subjects (English, Maths and Science). General and non-specific study advice has been highlighted as potential barrier in the translation of theory into practice as is frequently cited as a reason that Dweck's research on mindset (Dweck & Leggett, 1988) has not always been shown to be effective (Kirschner & Kendrick, 2020) though replicability issues are impacted when research applications are taken beyond their intended remit. For example, mindset research has been conceptualised as wielding a 'not yet' philosophy within the classroom, which is an intangible ethos that would be hard to measure.

With a multitude of language developing out of cognitive science around metacognition and its related theories an additional barrier to busy teachers may also be navigating the lexicon issues and selecting appropriate terminology for use in the classroom. Therefore, a key aim of this research was to translate the potential benefits of SRL to teachers' specialisms and support the application of the key concepts to a range of barriers to learning that teachers perceived were impacting some of learners. A specific intention was to use language and strategies that were accessible and applicable to all subject areas. The resulting feedback from teachers it is hoped can benefit professionals supporting the effective instructional practices in secondary environments to focus on evidence-based approaches. This will ensure a wide range of learners develop reflective learning skills to maximise their potential both in school and in their life-long learning journey.

Having the voice of the teaching profession as part of the research base regarding delivery of self-regulated learning into the secondary curriculum is fundamental. Knowledge of what elements of teaching SRL strategies help to address provides a stronger selling point for professionals supporting schools. Confirmation that SRL supports a range of learners and can be adapted across a range of secondary subjects are important and useful points to share.

4.3.1 Academic beneficiaries of the Research.

Research can contribute to academia in a number of ways; understanding phenomena, examples of methodology in use and perspectives in carrying out

research in specific fields. The review paper was the first evaluation of self-regulated learning within the secondary population with learning disabilities. In a recent review across primary and secondary settings it was highlighted that less than 50% of the studies reporting academic benefits of SRL interventions report characteristics such as disability category (Elhusseini et al., 2022). The review in chapter two showed that gathering pupil characteristic data can provide greater insight into whether interventions support learning across a range of pupil needs. The review contributes to the knowledge in the area of self-regulated learning as a whole class approach to building study skills in secondary populations. This is important as increased efficacy as a learner can be a lifelong skill beyond the school gate.

The empirical paper explores teacher perspectives of self-regulated learning and provides insight into the areas that can be promoted when working with teachers to embed SRL. The findings showed that a selling point of SRL for teachers is that it can be adapted to different subject specialisms with support and can meet a range of concerns that teachers have regarding student engagement and equity across the classroom. With reference to implementation science the opportunity to discuss practice implications was received well by the teacher participants consistent with the framework suggested by Kratochwill et al. (2012). Implementation would be further enhanced in this respect when a whole school approach is taken to support the ongoing focus on SRL.

Reflections on this body of work are that single case experimental designs are a useful method of meeting the needs of both an academic audience and respecting individual differences of pupils, in terms quantifying change in student academic outcomes and highlighting contextually relevant information that schools need to make use of research findings.

Academic beneficiaries of this research will best be met by dissemination (Lomas, 1993) through publication of the review and empirical papers and by presenting the work at conferences and using poster presentations to a targeted professional audience.

4.3.2 Economic and Societal Beneficiaries of the Research

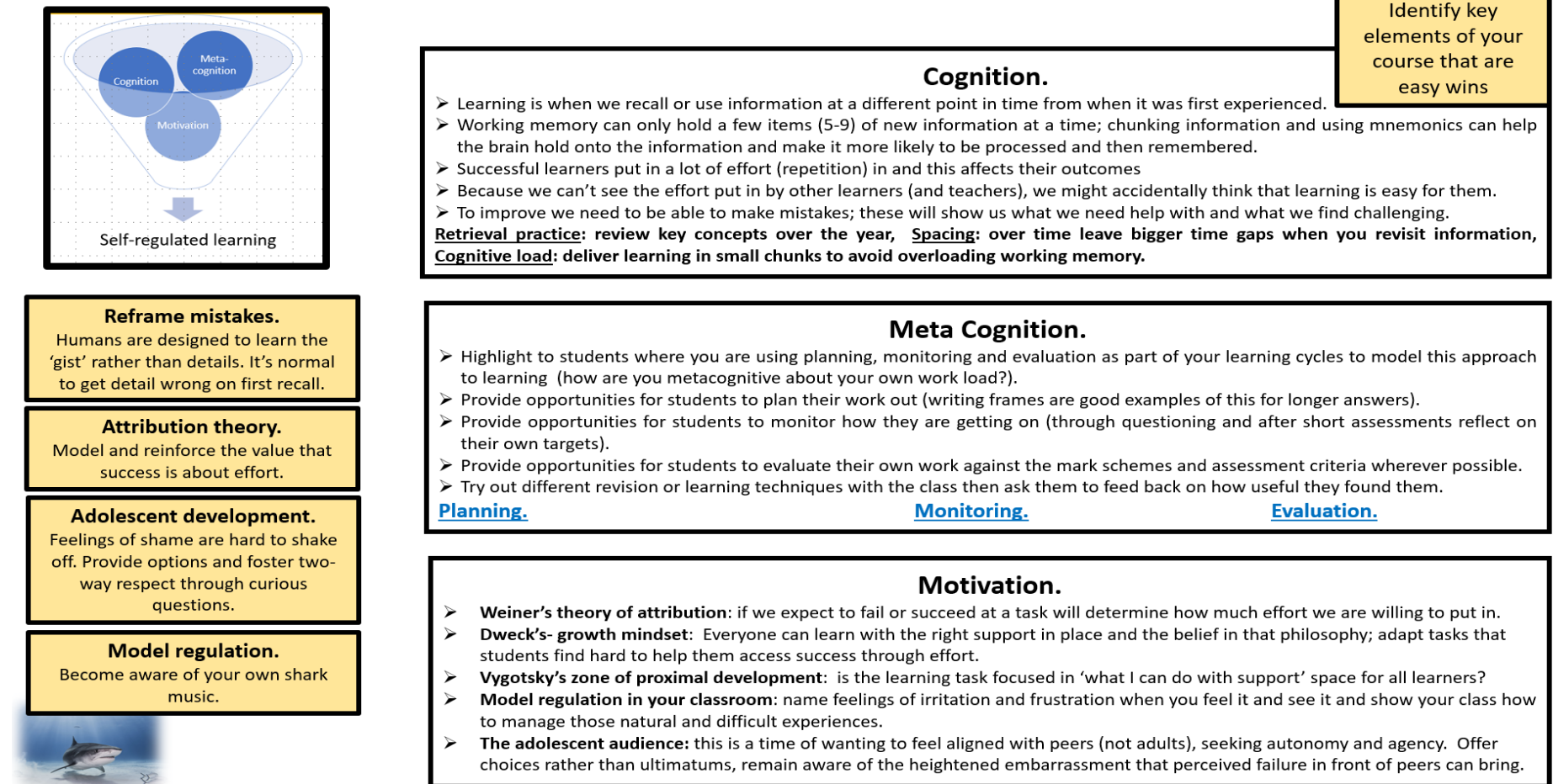
Societal benefit of this research is the inclusion of a systematic literature review to ensure that a widely promoted approach to learning benefits those with learning disabilities and is not merely developing further the skills of those learners with who might benefit from any advice or support given in class due to their already developed independent learning skills. Messages that students receive about their ability from both individual staff and systemic level initiatives, such as setting, can impact on how students feel about themselves as learner and there are gender and ethnicity differences in the pupils that more frequently populate the lower sets (Francis et al., 2017). From a wider societal perspective having learners leave school with confidence in their ability to develop new skills and be self-directed learners has implications for being an autonomous adult.

As rates of school exclusion increase each year students move through the education system and peak in year 10 (Gov.uk, 2022) it is helpful to focus on increasing engagement and motivation for this age-group and ensure that students enter key stage four empowered to develop self-efficacy around their learning skills. Benefits to students include developing lifelong learning skills that will impact their confidence in developing future life skills, engaging with training opportunities during employment and ultimately career trajectory. Additionally, the evidence for use with students with learning disabilities suggests that awareness and use of SRL strategies also meets the requirements of the SEN code of practice ((DfE & DoH, 2015).

An initial attempt at messaging targeted at a teacher audience was created after workshop one; a summary poster (Figure 4.2) was created to act as a review, whilst also modelling the use of a graphic organiser in the session. The impact for teaching staff of this workshop initiative is the development of their self-efficacy to address bespoke learning advice within their specialist area. This summary received positive feedback.

In this respect alongside dissemination of thesis findings changes to service delivery and professional behaviour can be affected with a focus on 'implementation' (Lomas, 1993) that can involve the further development of resources and training for use within my local authority and throughout my practice as an educational psychologist once qualified.

Figure 4. 2 Workshop Handout



The findings from both papers have relevance to educational psychologists advising and suggesting interventions; with the benefit of being a whole class approach supportive of those with additional needs. A presentation was delivered to a large local authority's educational psychology service (July 2022) outlining the theoretical principles underpinning SRL and the summary poster was provided to support group discussions (Figure 4.2). EPs were invited to annotate the poster in groups to identify where they felt this approach aligned with other practice-based initiatives that they were involved in. There was a positive response from EPs that this focus on systemic learning skills was an area that:

- a) was felt to be relevant to a diverse selection of their current work (see Table 4.2);
- b) was something that they would like to do more work on with schools.

From a societal perspective, when EPs work with a systemic and early intervention perspective more people are impacted and there can be a direct impact on the quality first teaching that all students should be receiving. Table 4.2 illustrates that SRL focused work has theoretical links with a wide range of EP work as well as addressing the need for all teachers and schools to be using metacognitive approaches as part of their teaching practice (Quigley et al., 2018). In this respect I am also aiming to have an impact through 'diffusion' (Lomas, 1993) by raising awareness when given the opportunity.

In summary the research presented in chapters two and three has far reaching implications for students, and staff working in schools and those that support them. Contributing to the knowledge base will require clear plans to disseminate.

Table 4. 2 *Summary of Areas that EPs Highlighted were Consistent with SRL principles*

Group	What parts of your work/other theories and interventions with young people does the three part definition of self-Regulated Learning (Cognition, metacognition and motivation) align with?
Group 1	• Links to executive functioning • Considering autistic students: reframing demand avoidance to finding the motivator and purpose of learning • Dynamic Assessment tools - use of mediation etc • Goal based outcomes • Motivation links to person centred planning (what's the purpose for the young person). • Instructional hierarchy (Haring & Eaton, 1978) • Retrieval practice and precision teaching • Motivational: locus of control and zones of regulation • Solution-focused approaches • Self-determination theory (Ryan et al., 2021, used in ELSA training)
Group 2	• Working memory training • Links with Vygotsky's zones of proximal development, and Bruner's spiral curriculum. • ELSA units on motivation • Reciprocal teaching • Links to EMS (executive functioning, meta-cognition) that was developed by Nikki Collingwood, previous TEP on placement. • Peer mentoring, support/tutoring. • Autism/ADHD etc (difficulties with executive functioning). • Growth mindset • Project based learning (PBL). • CAME/CASE primary, Cognitive acceleration in maths and science.
Group 3	• John Hattie - Barometer of influence

	• How do learners feel? • Self-determination • limit of construct of motivation • how to motivate students? Is 'motivation too superficial? • Relational work - teacher-pupil relationship • Feeling a sense of belonging- teacher pupil relationships boost belonging and motivation to attend school and participate
Group 4	• What is the students' goal/reason for taking the course? • Executive functioning training • Intermittent reward and goal-based individual learning targets • Cognition - repetition links with precision teaching
Group 5	• Thinking about content delivery • Importance of self-efficacy • How training is delivered to schools - how much information is given in a short time frame, are teachers taking it in?
Group 6	• Support with the how to achieve rather than what? • What is the barrier to changing the pedagogy of learning - despite the rich literature? It hasn't changed. • Developmentally - children's views on self-regulated learning vs. direct instruction • Thinking about context and vocabulary to bring everyone to the same starting line.

4.4 Plans for dissemination

4.4.1 Importance of dissemination

As the majority of doctorate students are on the course through the government funded scheme (<https://www.aep.org.uk/training/>) it is important to disseminate the research completed as part of this process.

Disseminating findings acts as a form of 'giving back' to society from the process and furthering the knowledge gained that is relevant to the education system and children's development.

Where possible opportunities to share information beyond the remit of the research process has been taken, for example by providing summary posters (Figure 4.2) to teacher participants that can be shared within their setting, to seeking out the views of EP colleagues on placement (Table 4.2). Further plans to disseminate findings to schools that participated in the process are imminent and will include a poster of the research overview.

4.4.2 Strategy for promoting and evaluating impact described

The audience range for dissemination covers both professional and academic journals, with the former being described as having a less formal presentation style (Oliver, 2008) that may suit the poster style summary that has been created to support the sharing of content. Table 4.3 summarises initial thoughts on dissemination audiences.

Table 4. 3 *Dissemination Methods and Audience Summary.*

Sources of information	Media	Audience
Systematic literature review	• Relevant academic journals • Relevant practitioner journals	Teachers who participated in workshops.
Empirical paper	• EPS CPD slot: research presentation • DECP trainee conference • UCL poster • Summary poster for professionals	Educational psychologists in local authority. Readers of psychological and educational psychologist practitioner journals. Teachers reading practitioner journals. Trainee educational psychologists.

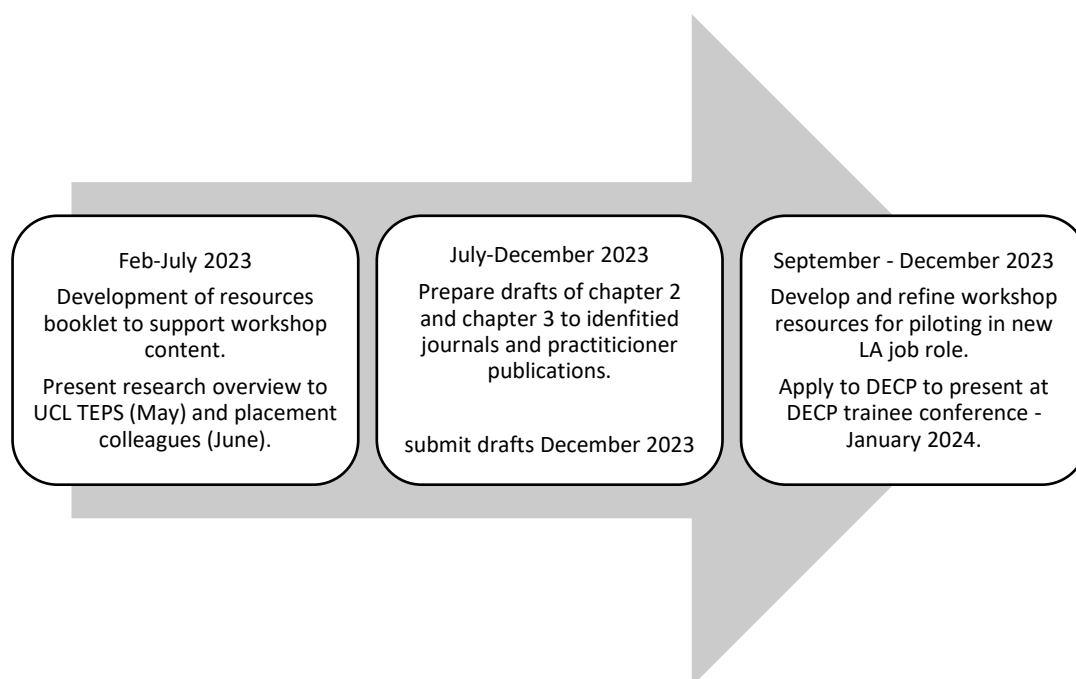
As the suggested audiences include both academic and practitioner readers, supervisor support to plan and adapt writing to meet the needs of a range of audiences and plan appropriate use of the findings within different contexts will be helpful.

The design of the workshops involved researching methods of training staff in schools and making use of self-regulated learning principles within the workshop content, therefore the feedback gathered from teachers regarding what they found helpful can be used to further refine the workshops and improve the impact of future work with schools. Development of a bank of resources to accompany the training (for e.g. how to make use of vocabulary banks in foreign language teaching, how to make analysis of text relevant to students in English literature classes) is a planned practical action alongside dissemination. This will ensure that the impact of the research can be disseminated to schools as part of the early intervention work delivered by this researcher once qualified.

4.4.2 Process of Dissemination

An approximate timeline for dissemination related to publication and sharing findings through presentations has been included (Figure 4.2) to illustrate an overview of this process.

Figure 4. 3 *Timeline for Dissemination*



The journals selected (Table 4.4) are relevant to either or all the fields of education, educational psychology and teaching. Journals with a range of impact scores are listed, with a view to starting with the first journal listed and submitting an article version of the empirical paper. The British Journal of Educational Psychology is a journal published by the British Psychological Society (BPS) and as such has a wide readership both in the UK and internationally. A less formal piece of writing submitted to the Chartered College of Teaching publication can focus on highlighting key points of both articles to justify and provide a rationale for the use of self-regulated Learning for inclusive practice.

One aim of dissemination will be renewing a focus on systemic and whole school initiatives over individual pupil work.

Following identification of relevant journals, the researcher prepared abstracts for both papers (Figures 4.4 and 4.5) using a 300 word limit and identifying five or six key words used to search for relevant journal articles online.

Table 4. 4 *Journal Titles Selected for Publication with Impact Information*

Journal titles	Relevance and information with impact data
British Journal of Educational Psychology	Academic and profession research focus related to education, development and the application to educational psychology specifically.
	International audience
	Impact score* 4.58
British Educational Research Journal	Profession and research specific journal for education.
	Impact score* 2.69
Educational Psychology in Practice	Profession specific journal featuring articles related to Educational Psychology and development.
	Impact score* 1.09
Impact: Journal of the Chartered College of Teaching	Profession specific termly journal that publishes peer-reviewed articles connecting research findings to classroom practice.
	No Impact score available

The impact score* represents the average number of times the articles published have been cited, according to SCOPUS in the current year and are shown where available.

Figure 4. 4 *Abstract for Empirical Paper Submission*

Empirical paper abstract submission draft. “I used to spoon-feed them”: Secondary school teachers experiences of incorporating self-regulated learning principles into curriculum delivery.
A multiple case study explored the experiences of secondary teachers following two workshops focused on the application of self-regulated learning principles (including theory around cognition, metacognition and motivation in the classroom context) to their course delivery. Three schools were included (two secondary comprehensives, one with low and one with high pupil premium numbers and one alternate provision) and given pre and post workshop questionnaires and follow up focus groups were used to capture teachers’ experiences of focusing on SRL in their lessons over one term. One teacher had a significant improvement (at the 95% confidence level) in post workshop attitudes towards self-regulated learning, with four others having small non-significant improvements. Teacher’s sense of self-efficacy, showed an improvement in all but one of the seven teachers completing pre and post measures, with one teacher showing significant improvements in total self-efficacy and sub-scales of efficacy in student engagement; three teachers showed significant improvements for efficacy in classroom strategies. A reflexive thematic analysis from post-workshop discussions identified three overarching themes of ‘Identifying with principles of SRL’, ‘Needs of students met by SRL’ and ‘Systemic issues creates need for change in teaching methods’. Teachers felt that SRL addressed a range of difficulties related to engagement across multiple specialist curriculum areas using age-appropriate strategies. Noticing for example, increased levels of independence across students, including those with additional needs when tasks were adapted using smaller tasks and scaffolding (cognition) and students were provided with frameworks to monitor, review or check their progress (metacognition). It is suggested that a focus on lifelong learning skills using SRL principles can to some extent address the systemic barrier raised by

teachers that students' feel that learning at this level is not relevant to their lives.

Word count 284.

Key words: secondary teachers, metacognition, motivation, cognition, self-regulated learning.

Figure 4. 5 *Abstract for Review Paper Submission*

Review paper abstract submission draft

Self-regulated learning as an inclusive method of improving academic skills with secondary school students: A systematic review.

This systematic literature review looks at the academic outcomes of interventions in school settings that use self-regulated learning (SRL) strategies, including metacognitive (MC) processes. Secondary aged-pupils with learning disabilities both within mainstream and specialist settings were included. Randomised control trials and single-case experimental design studies were included.

SRL has been described as 'a key construct in education' (Boekaerts & Cascallar, 2006). The education endowment foundation (EFF, Muijs & Bokhove, 2020) recommends SRL interventions and suggests that academic outcomes using this strategy can confer advantages worth up to 7 months of progress. However, the EFF (n.d) review supporting its use with learners with additional needs, draws on references from meta analyses that consider learning disability intervention as a whole and not specifically SRL and does not focus on secondary age populations. This review focuses specifically on interventions aligned with SRL, that report findings for populations that have learning disabilities and are from an adolescent school population.

This review identified eleven studies, appraised using Gough's (2007) Weight of Evidence framework. The findings show mainly large effect sizes with some medium effect sizes. The paper

concludes with strengths and limitations regarding how these strategies can be employed in schools and applied by educational psychologists to enhance student outcomes. A strength was that positive outcomes were seen across researcher delivered, teacher delivered and peer-led interventions suggesting that effectiveness can be achieved across a range of factors. Findings suggest SRL interventions are suitable for school staff training as whole class application rather than just used as an individual intervention.

Word count: 254

Key words: self-regulated learning, adolescence, learning disability, whole-school intervention, review.

4.4.6 Other plans for dissemination to specialist and non-specialist audiences

A summary poster will feedback to teaching staff and schools that were involved in the research project including key findings that may be of particular interest to those who completed all elements of the workshops and the focus groups.

Once in post as a qualified educational psychologist it will be possible to seek out opportunities both locally and nationally to develop and share materials appropriate to initial teacher training. This will provide opportunities to model and influence the approach of early career teachers in their use of specialist curriculum skill knowledge to build relationships with their students that can build trust from students in their teaching practice.

An opportunity to present the research and findings to training EPs at UCL (a long-standing part of the doctorate training course) and to colleagues on

placement will help to prepare and refine the presentation for future audiences at conferences that achieve wider attention, such as the Association of Educational Psychologists annual conference, the local Regional EP annual research conference and local authority events.

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Appendices.

Appendix A Workshop 1 and 2 slides

Developing Self-regulated learners Workshop 1.

Research based principles to improve classroom practice for learners

Stephanie Little (stephanie.little.20@ucl.ac.uk)

Summer term 2022

Trainee Educational Psychologist at UCL

Self-regulated learner: training commitment.

- ✓ **Teacher consent** to participate in the research is needed because I am going to make use the information that you share with me anonymously and write it up and potentially publish the findings.
- ✓ Complete a teacher self-efficacy questionnaire today and after 8 weeks
- ✓ Complete a teacher questionnaire today and after 8 weeks
- ✓ To complete a fidelity questionnaire at our second workshop
- ✓ To attend a feedback session (30mins) to tell me what you thought of using SRL in your classroom.

Developing students as self-regulated learners

- An interactive workshop designed to inspire reflection on how your own planning, monitoring and evaluation strategies can be used in your lessons to discuss learning and promote self-regulation with students.

Self-care and ethics in research

- <https://www.educationsupport.org.uk/get-help/help-for-you/helpline/>

- Your right to withdraw

Self-regulated learning: Objectives of the workshops

Workshop 1

1. To be able to explain the three elements of SRL.
2. To be able to explain an example of cognition and meta-cognition relevant to classroom planning.
3. To set an achievable goal for trying out the first two elements of SRL over the next few weeks.

Workshop 2

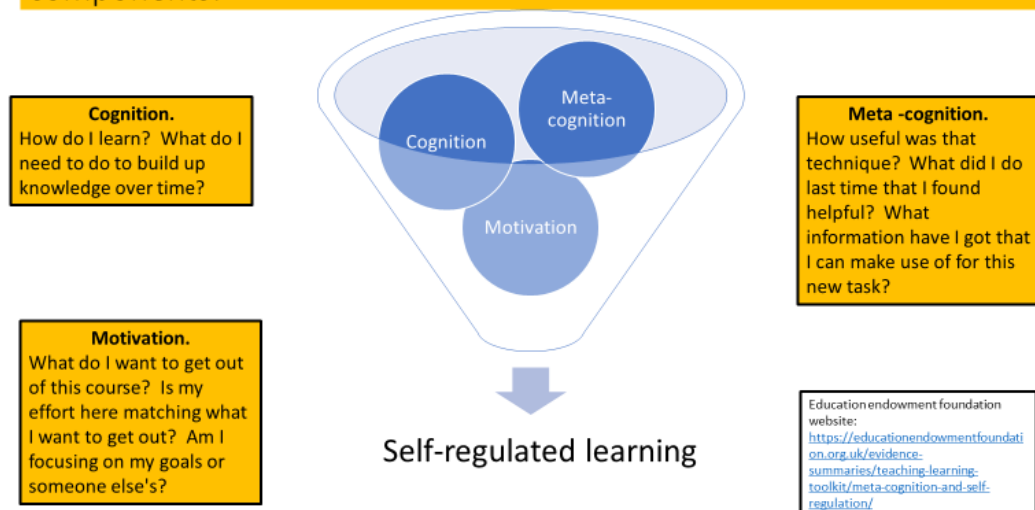
1. To review goals set and feedback on what worked well and barriers to delivery
2. To be able to explain an element of motivation relevant to classroom planning.
3. To set an achievable goal based on SRL for the next few weeks.

Self-regulated learning: Objectives of workshop 1

Workshop 1

1. To explain the three elements of SRL.
2. To explain an example of cognition and meta-cognition relevant to classroom planning.
3. To set an achievable goal for trying out the first two elements of SRL over the next few weeks.

Self-regulated learning can be broken into three essential components:



Self-regulated learning can be broken into three essential components:

1. Cognition - the mental process involved in knowing, understanding, and learning;
2. Metacognition - often defined as 'learning to learn'; includes planning, monitoring and evaluating.
3. Motivation - willingness to engage our metacognitive and cognitive skills.

Education endowment foundation website:
<https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/meta-cognition-and-self-regulation/>

What does a self-regulated learner do?

Make use of all the information given and apply it to their work.

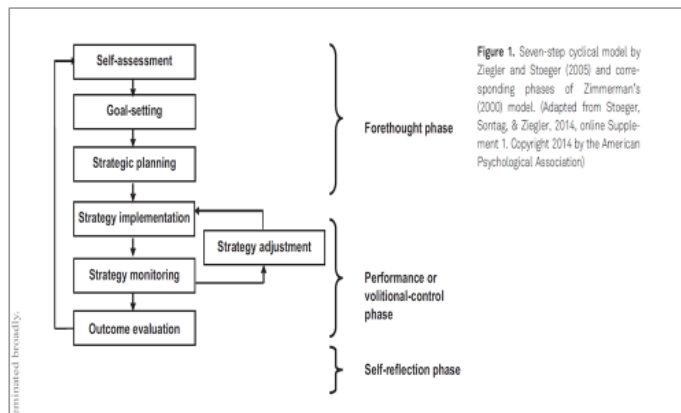
Try things out that might improve their learning.

Are motivated to try out new things because they believe **effort** will make a difference.



They do not have a fixed view of intelligence/ability.

“Well actually it’s a little bit more complicated than that.....”



Learning is a very complex process – here is a more complex version that fits the same broad criteria.

The three part model is a way of keeping it accessible.

Time to reflect:



What are your thoughts on the three key elements of SRL?



What is one thing that you already do that fits into this description?



Is there something that you think is equally important but missing?



Is there a problem for you with this view of effective learning so far?

Handout

From EFF meta-cognition and self-regulation: what should I consider?

- ☐ Select explicit strategies you can teach your pupils to help them plan, monitor, and evaluate specific aspects of their learning.
- ☐ Give them opportunities to use these strategies with support, and then independently.
- ☐ Set an appropriate level of challenge to develop pupils' self-regulation and metacognition in relation to specific learning tasks?
- ☐ Promote and develop metacognitive talk related to your lesson objectives?
- ✓ Undertake professional development to develop your knowledge and understanding of these approaches.

Education endowment foundation website:
<https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/meta-cognition-and-self-regulation/>

SCHOOL AUDIT TOOL

Teacher knowledge

Ineffective	Improving	Exemplary
Teacher knowledge: ✓ Teachers are either unaware of or have an incorrect understanding of metacognition and self-regulation. ✓ Teachers are unaware of specific terminology, such as metacognitive knowledge (task, strategies and self) and metacognitive regulation (planning, monitoring and evaluating). ✓ Teachers are unaware of the EEF toolkit and guidance reports. Teacher practice: ✓ Teachers only explicitly explain their thinking on an ad-hoc basis and without consistent planning or structure. ✓ Teachers do not support pupils in planning, monitoring or evaluating their learning. ✓ Challenge is often pitched too low or too high in lessons. ✓ Teachers' modelling does not take account of the need to explicitly share the thinking behind each step. ✓ Tasks are either scaffolded too much and reduce thinking, or are not scaffolded enough and create cognitive overload.	Teacher knowledge: ✓ Teachers have a partial understanding of metacognition and self-regulation. This may include some misunderstandings. ✓ Teachers are aware of specific terminology, such as metacognitive knowledge (task, strategies and self) and metacognitive regulation (planning, monitoring and evaluating). ✓ Teachers are aware of the EEF toolkit and guidance reports but they exhibit a limited understanding of metacognition and self-regulation. Teacher practice: ✓ Teachers explicitly explain their thinking in a structured way for some tasks. ✓ Teachers provide support for pupils in either planning, monitoring or evaluating their learning, but this is inconsistent. ✓ Challenge is sometimes pitched too low or too high in lessons. ✓ Teachers' modelling sometimes takes account of the need to explicitly share the thinking behind each step. ✓ Scaffolding is taken into account when planning tasks, but is not consistent and does not apply cognitive load principles.	Teacher knowledge: ✓ Teachers have a deep understanding of metacognition and self-regulation. ✓ Teachers understand the specific terminology of metacognitive knowledge (task, strategies and self) and metacognitive regulation (planning, monitoring and evaluation) and they can explain them with sophisticated insight. ✓ Teachers are aware of the EEF toolkit and have read the metacognition guidance report, which leads to a confident understanding of metacognition and self-regulation. Teacher practice: ✓ Teachers consistently execute an explicit explanation of their thinking for most tasks. ✓ Teachers consistently provide support for pupils in all facets of planning, monitoring and evaluating their learning. ✓ Challenge is regularly pitched in the zone of desirable difficulty. ✓ Teachers' modelling consistently takes account of the need to explicitly share the thinking behind each step. ✓ Scaffolding is taken into account when planning tasks and principles of cognitive load are applied.

Key elements of learning that students need to be aware of

1. Attending the lesson is not 'learning'.
2. Learning is a process that takes place over time. It is what you know at a later point in time from when you heard/saw/tried it.
3. Successful learners put in a lot of effort across a set of lessons and that leads to increased repetition of the content.
4. When processing new information there is a limit to what you can take on board in each lesson that is new.
5. We learn more efficiently when we have a framework on which to add new knowledge.

Key elements of learning that students need to be aware of

1. Attending the lesson is not 'learning'.
2. Learning is a process that takes place over time. It is what you know at a later point in time from when you heard/saw/tried it.

Learning is being able to use information at another point of time when it is relevant.

Learning is a process that happens over a period of time.

Student misconception: we learn content in the lesson that it was first taught.



Student believes they are not good at learning when they don't remember something from today in the next lesson.

Encourage and model honest reflection



I'm not sure you did all of that lesson work. What one thing could you do differently next time to improve your outcomes.

Well done you worked hard in that lesson and completed all the work.

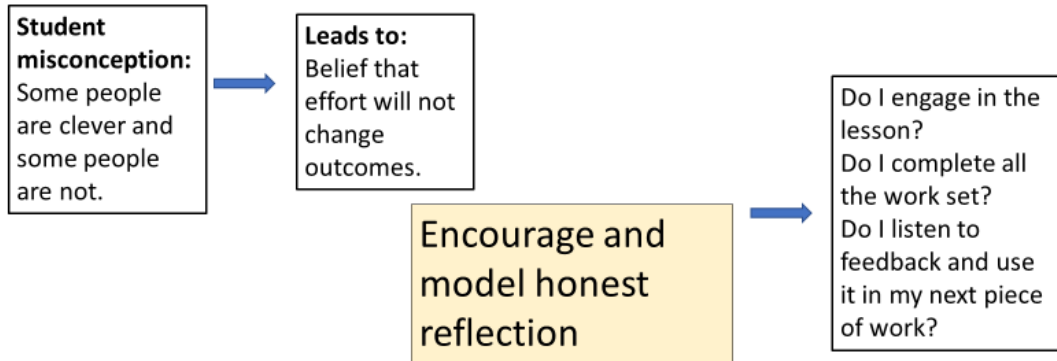
Attending the lesson is not 'learning'

Learning is being able to use information at another point of time when it is relevant.

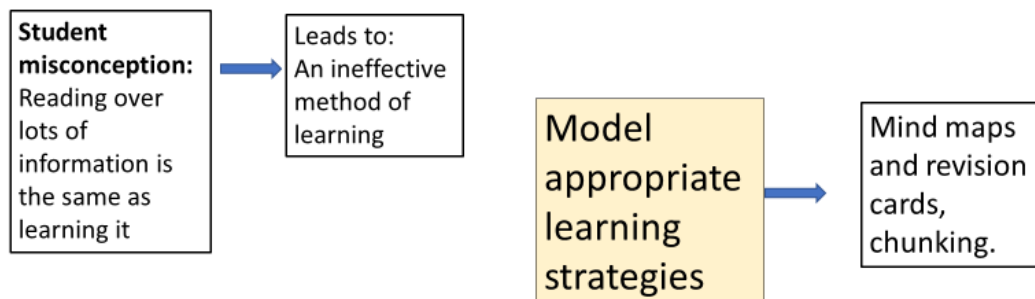
Learning is a process that happens over a period of time.

- Make explicit reference in your lessons to planning cycles and where revisiting and reinforcing learning is built into the scheme of work.
- Verbalise when you recognise they have not had as much preparation as others in the class. **Model realistic appraisal.**

3. Successful learners put in a lot of effort across a set of lessons and that leads to increased **rehearsal** of the content.



4. When processing new information there is a limit to what you can take on board that is new.



Attending the lesson is not 'learning'

Learning is being able to use information at another point of time when it is relevant.

Learning is a process that happens over a period of time.

- Make explicit reference in your lessons to planning cycles and where revisiting and reinforcing learning is built into the scheme of work.
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Attending the lesson is not 'learning'

"I'm not surprised you didn't meet your target grade this time, remember you did miss the lesson on this as you were (off sick/in an exam/ having a bad day)"

- Make explicit reference in your lessons to planning cycles and where revisiting and reinforcing learning is built into the scheme of work.
- Verbalise when you recognise they have not had as much preparation as others in the class. **Model realistic appraisal.**

Attending the lesson is not 'learning'

"I'm not surprised you didn't meet your target grade this time, remember you did miss the lesson on this as you were (off sick/in an exam/ having a bad day)"

- Model realistic appraisal.
- Then provide regulation support

"At least that has helped us to see how important it is for you to do (XYZ) when you have missed a lesson"

OR

"That's helped us to find a gap in your learning. I'm glad we could see this now whilst there is still time to sort it out"

Strategies for classroom practice

- Daily/regular reviews of key concepts.
- Revisit key concepts and new ideas in other lessons.
- Reduce learning into reasonable sized chunks.
- Review related topic material before teaching new material.
- Embody a growth mindset that learning is possible for us all.
- Scaffolding and support

➤ Retrieval practice

➤ Spacing

➤ Cognitive load theory (awareness of working memory)

➤ Growth mindset

➤ Metacognition

Chunking: What areas of the course can be boiled down to a list to be remembered?

- Psychology GCSE.

Ethics

- Informed consent
- Deception
- Confidentiality/privacy (Debrief)
- Right to withdraw
- Protection from harm

Can Do Can't Do With Participants

Repetition is a good strategy
Mnemonics help chunk information.



Re-framing mistakes/errors

- Frequent rehearsal and opportunities to practice new skills allows errors to happen and get addressed.
- When we learn new information our brains do a 'best fit' efficient approach based on current schemas (pockets of knowledge).
 - Students schemas will differ across a room
 - Efficiency in remembering leads to errors (getting the gist but losing the detail).
 - We need to see the errors. If practice isn't monitored misconceptions will go un-noticed and get laid down as memory.

Cognition: reflections of own practice

- What are you already doing?
- What can you do more of and where/when?
- What new ideas might you incorporate?

What is metacognition?

Meta -cognition.
A plan do review approach
to being a learner.
 How useful was that
 technique?
 What did I do last time that
 I found helpful?
 What information have I
 got that I can make use of
 for this new task?

Planning

What do I need to do?
 How long will it take me?
 What do I know that I can use here?

Monitoring

How am I doing?
 Do I need any help?
 Have I met any criteria?
 Am I still focused on the task?

Evaluation

What have I done well?
 What can I change for next time?
 What do I know now that will help next
 time?
 What other help do I need to improve?

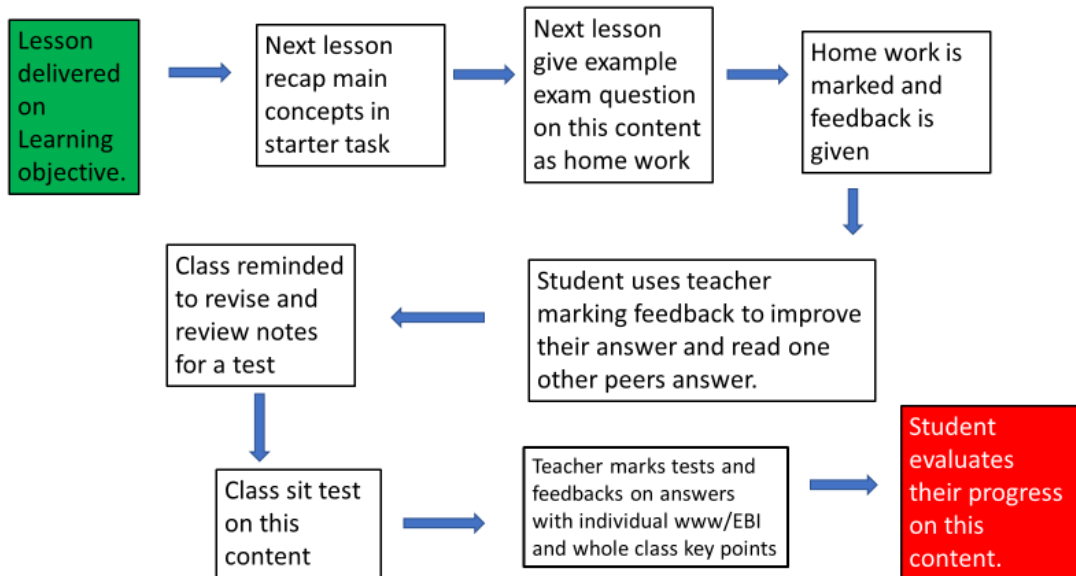
METACOGNITION The seven-step model



Metacognition--The seven-step model

Self-evaluation questions: how well did I do in comparison to my target grade? How much of the process did I participate in? Did my outcome reflect how much of the process I participated in? What was my feedback like on my exam question? Was it still the same feedback or different at the test?

1. New content delivered.	
2. Next lesson recap main concepts in starter task	
3. Give example exam question on this content as home work	
4. Home work is marked and feedback is given	
5. Student uses teacher marking feedback to improve their answer and read one other peers answer.	
6. Class revise and review notes for a test	
7. Class sit test on this content	
8. Teacher marks tests and feedbacks on answers with individual www/EBI and whole class key points	
Student evaluates their progress on this content.	



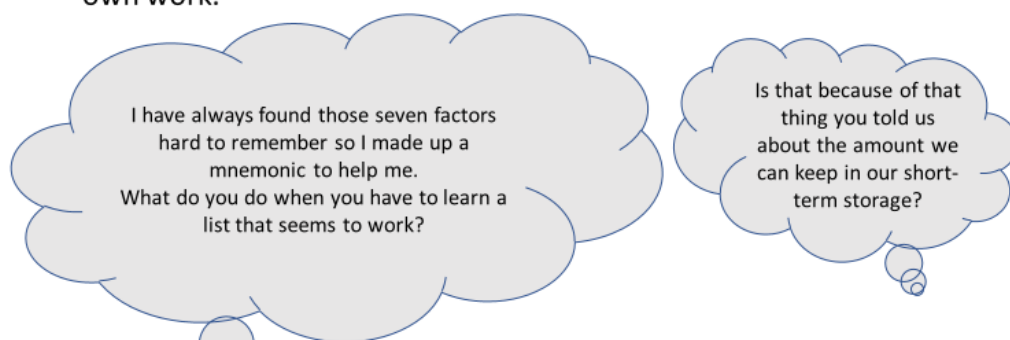
What parts of your lessons/schemes of learning are metacognitive?

Planning	What do I need to do? How long will it take me? What do I know that I can use here?
Monitoring	How am I doing? Do I need any help? Have I met any criteria? Am I still focused on the task?
Evaluation	What have I done well? What can I change for next time? What do I know now that will help next time? What other help do I need to improve?

In which parts of the course are your students carrying out plan, do, review cycles of their own learning?

What can a teacher do to support self-regulated learning?

- Model the processes that you are telling them will help them in your own work.



What skills are needed in the assessment process that students can learn through practice?

12 mark questions have to contain some AO1 (outline) before they could score any marks on the other sections.

Some A02 (description) before they can score any other marks...

Some A03 (evaluation)

Title of question (12 marks)

Sentence starter for AO1

Sentence starter for A02

Sentence starter for A03

Proformas are a good tool to use to create strategy tactics

What skills are needed in the assessment process that students can learn?

And can also help you differentiate your study advice.

You didn't write an answer in the last assessment. To improve make one AO1 point and that will get you scoring on the 12 markers.

Title of question (12 marks)

Sentence starter for AO1

Sentence starter for A02

Sentence starter for A03

Proformas are a good tool to use to create strategy tactics

Metacognition: reflections of own practice

- What are you already doing?
- What can you do more of and where/when?
- What new ideas might you incorporate?

What can you do before our next session in week 3

- What can you trial?
- What resources could you use or adapt?
- What can you identify that you are already doing and maximise that approach?
- What sounds tricky that you are less sure about?

Goal setting: week 1

Set goals and targets of how many lessons to target before our next workshop

What I can do before workshop 2?

What would I be able to see in the class if this approach had been helpful? Have I got particular people in mind that might benefit?

What I think would not work in this unit of work and why?

Next time: Motivation

Developing Self-regulated learners Workshop 2.

Research based principles to improve classroom practice for learners

Stephanie Little

Summer term 2022

Trainee educational Psychologist at UCL

Developing Self-regulated learners

Workshop 2.

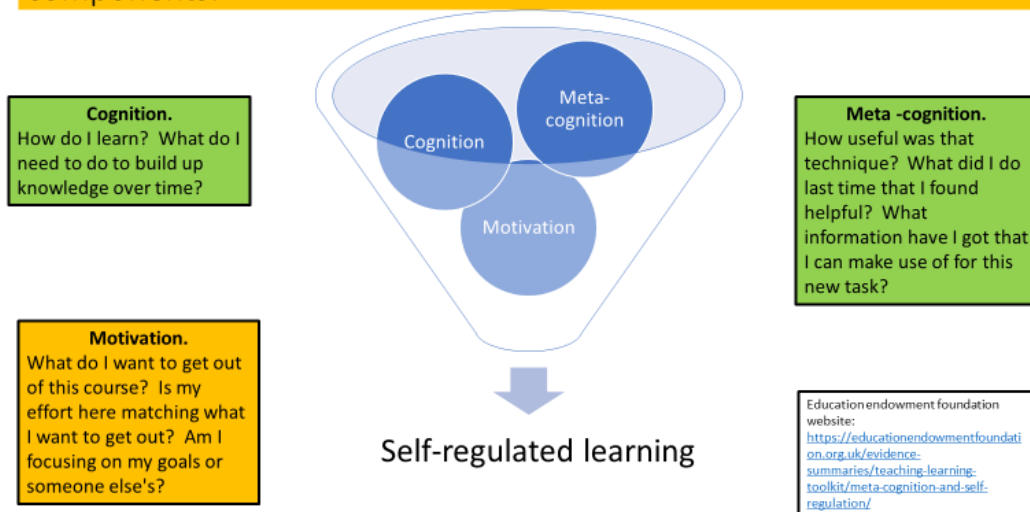
Research based principles to improve classroom practice for learners

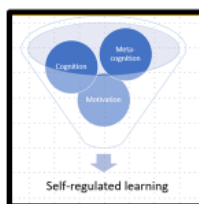
Stephanie Little

Summer term 2022

Trainee Educational Psychologist at UCL

Self-regulated learning can be broken into three essential components:





Reframe mistakes.

Humans are designed to learn the 'gist' rather than details. It's normal to get detail wrong on first recall.

Attribution theory.

Model and reinforce the value that success is about effort.

Adolescent development.

Feelings of shame are hard to shake off. Provide options and foster two-way respect through curious questions.

Model regulation.

Become aware of your own shark music.



Identify key elements of your course that are easy wins

Cognition.

- Learning is when we recall or use information at a different point in time from when it was first experienced.
- Working memory can only hold a few items (5-9) of new information at a time; chunking information and using mnemonics can help the brain hold onto the information and make it more likely to be processed and then remembered.
- Successful learners put in a lot of effort (repetition) in and this affects their outcomes
- Because we can't see the effort put in by other learners (and teachers), we might accidentally think that learning is easy for them.
- To improve we need to be able to make mistakes; these will show us what we need help with and what we find challenging.

Retrieval practice: review key concepts over the year, **Spacing:** over time leave bigger time gaps when you revisit information, **Cognitive load:** deliver learning in small chunks to avoid overloading working memory.

Meta Cognition.

- Highlight to students where you are using planning, monitoring and evaluation as part of your learning cycles to model this approach to learning (how are you metacognitive about your own work load?).
- Provide opportunities for students to plan their work out (writing frames are good examples of this for longer answers).
- Provide opportunities for students to monitor how they are getting on (through questioning and after short assessments reflect on their own targets).
- Provide opportunities for students to evaluate their own work against the mark schemes and assessment criteria wherever possible.
- Try out different revision or learning techniques with the class then ask them to feed back on how useful they found them.

Planning.

Monitoring.

Evaluation.

Motivation.

- **Weiner's theory of attribution:** if we expect to fail or succeed at a task will determine how much effort we are willing to put in.
- **Dweck's growth mindset:** Everyone can learn with the right support in place and the belief in that philosophy; adapt tasks that students find hard to help them access success through effort.
- **Vygotsky's zone of proximal development:** is the learning task focused in 'what I can do with support' space for all learners?
- **Model regulation in your classroom:** name feelings of irritation and frustration when you feel it and see it and show your class how to manage those natural and difficult experiences.
- **The adolescent audience:** this is a time of wanting to feel aligned with peers (not adults), seeking autonomy and agency. Offer choices rather than ultimatums, remain aware of the heightened embarrassment that perceived failure in front of peers can bring.

Self-regulated learning: Objectives of workshop 2

Workshop 2

1. To review goals set and feedback on what worked well and barriers to delivery
2. To be able to explain an element of motivation relevant to classroom planning.
3. To set an achievable goal based on SRL for the next few weeks.

Reviewing workshop 1

handout

What went well?

Target setting.

- What do I want to try more of?
- What do I want to do next?

What was not successful?

motivation

What can a teacher do to support self-regulated learning?

Recap from last session

Use language that reflects the belief that people who are finding things hard to remember just haven't tried the right learning techniques yet.

Use language that reflects a belief that anyone can learn with effort.

Allow the students to reflect honestly without negative judgement:
"I didn't really revise for that exam, sir".

Motivation is a key part of self-regulation

Weiner's' theory of attribution

- A person's expectancy for success or failure will determine how much effort they put into the task.

What we are trying to promote:

- ✓ Attributing success to effort and ability.

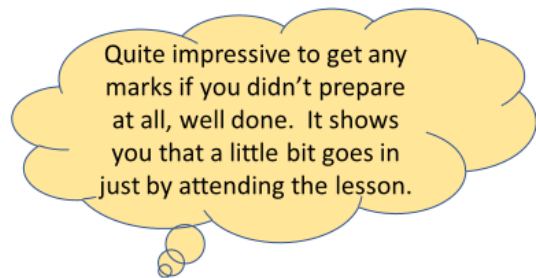
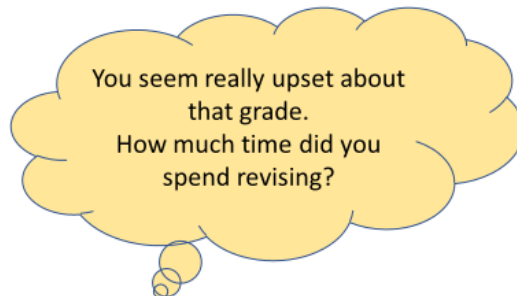
What we need to be aware of:

- Attributing failure to external sources protects our self-esteem.

[Weiner's Attribution Theory of Motivation: Definition & Examples - Video & Lesson Transcript | Study.com](#)

motivation

Check that irrational conclusions about effort are not being made through gentle questions?



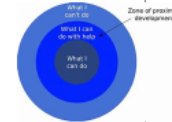
Model belief in your learners

- Everyone can learn and make progress with the right support and right headspace and motivation.
- Check that you are modelling that in your approach with learners.

➤ Dweck – Growth mindset.

Praise effort not intelligence

➤ Vygotsky's zones of proximal development.



➤ Solity et al – little and often approach was demonstrated in precision teaching research.

Self-regulated teaching: model regulation

- ✓ Keep calm and try not to take their lack of effort personally.
- ✓ We may not 'see' the impact that we have had in the moment. Often advice we give settles on people after we leave them, when they have space to think.

Remind them kindly, it is *their* learning and *their* lesson that you are

Chip away at negative attitudes by reframing them back, this will have an impact **over time.**

Self-regulated teaching: model regulation

- Learn about what it is that pushes your button and work on acknowledging your response without responding.

- What is your shark music?



Understand your audience



Adolescence is a developmentally distinct part of our life cycle.

This has been supported by neuroscience as well as behavioural science.

- Adolescents prioritise peer relationships over relationships with adults
- Adolescents will experience shame in front of peers more painfully than an adult or child.
- Avoiding social embarrassment can be a priority.
- Frontal lobe development and reorganisation is underway and will not stop until 25 years old.

Limbic system (emotional pathways) mature faster: meaning the strong emotional response we experience in adolescence outstrips our ability to reason

Yeager, Dahl & Dweck, 2018

Self-regulated teaching: model regulation

Acknowledge when some one feels they are not good at your subject and reassure them that you believe that they can do this.

- Ask students – is there something that works in other lessons that you think might help?
- Offer advice/options – would you like me to give you a couple of things to focus on?
- Be realistic – I understand that you don't do any work outside of the lesson, what can we do in class to make better use of this time? 🍷

Motivation: reflections of own practice

- What are you already doing?
- What can you do more of and where/when?
- What new ideas might you incorporate?

You can use your target setting sheets to plan your actions.

Goal setting: part 2

What ideas will you be taking into your lessons over the next half term?

What I can try out over the next couple of weeks.

What would I be able to see in the class/pupil if this approach has been helpful? Have I got particular young people in mind that might benefit?

What do I think would not work for my area of work?

Appendix B

Checklist for quality of research: Consolidated criteria for reporting qualitative research (COREQ-32, Tong et al., 2007).

Domain one: research team and reflexivity	The researcher conducted all the focus groups and delivered the intervention. The researcher is a trainee educational psychologist completing a professional doctorate, who has completed previous research project for a Master's degree in child and adolescent mental health and have previously worked as a secondary Psychology and science teacher for 18 years.. The researcher is female. Staff who received the training in School one and school three were not known to the researcher, staff in school two may have known of the researcher prior to the study as the Head of their pastoral team who arranged the training dates is married to the researcher, but no staff members had met the researcher before. Bias of the researcher: as a teacher the researcher had previously used and found useful several of the self-regulated learning techniques that were described and discussed in the training. The researcher previous role in teaching has led them to feel that content is being prioritised over developing confident and competent learners, this perspective may impact the analysis and interpretation of views expressed by teachers. Lack of experience and knowledge in an alternative provision meant that the delivery to school three rested on gaining teacher feedback and perspectives on what elements were most relevant to their setting – which led to a greater emphasis on motivation as learners were perceived as being more likely to have been negatively impacted by previous learning experiences.
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Domain two:	Methodological orientation and theory underpinning the study has been described.
Study design	Participant information, sample size and recruitment are covered along with information around settings that teachers were recruited from and broad demographic area. Information around challenges in recruitment and attrition included. Information provided on data collection methods and recording and transcription. Data saturation and member checking was not appropriate for this type of research analysis.
Domain three: Analysis and findings	There was one data coder. Different stages of the coding process are included. Themes were derived from data. NVivo was initially used to develop codes and paper and pen coding was carried out in second analysis. Participant quotations used to demonstrate themes. Supervision was used to ensure that findings are consistent with the data. Themes are presented clearly in diagram format. All themes, including minor themes and initial codes are reported in appendices.

Appendix C References for studies excluded at the full paper review.

Reference	Reason for exclusion
Berkeley, S., Larsen, A., Colburn, A., & Yin, R. (2019). Self-Regulation of Middle School Students With Learning Disabilities During a Complex Project-Based Science Activity. <i>Journal of Educational and Developmental Psychology</i> , 9(2), 1.	4. Outcome: No quantitative academic outcomes assessed.
Bishara, S., & Kaplan, S. (2018). The Relationship of Locus of Control and Metacognitive Knowledge of Math with Math Achievements. <i>International Journal of Disability, Development, and Education</i> , 65(6), 631-648.	3. Comparison: No pre and post data.
Boyle, J., Rosen, S., & Forchelli, G. (2016). Exploring metacognitive strategy use during note-taking for students with learning disabilities. <i>Education 3-13</i> , 44(2), 161-180.	4. Outcome: No quantitative academic outcomes assessed.
Callan, G., & Cleary, T. (2019). Examining cyclical phase relations and predictive influences of self-regulated learning processes on mathematics task performance. <i>Metacognition and Learning</i> , 14(1), 43-63.	3. Comparison: No pre and post data.
Duchardt, B. A., & And Others. (1995). A Strategic Intervention for Enabling Students with Learning Disabilities to Identify and Change Their Ineffective Beliefs. <i>Learning Disability Quarterly</i> , 18(3), 186–201.	2. intervention Not a self-regulated learning or metacognitive focus.

Girli, A., & Öztürk, H. (2017). Metacognitive reading strategies in learning disability: Relations between usage level, academic self-efficacy and self-concept. <i>International Electronic Journal of Elementary Education</i>, 10(1), 93-102.	3. Comparison: No pre and post data.
Goodman, L., Corkum, P., & Johnson, S. (2017). A metacognitive training pilot study for adolescents with autism spectrum disorder: Lessons learned from the preliminary stages of intervention development. <i>Journal of Intellectual & Developmental Disability</i>, 42(2), 204-210.	3. Comparison: No pre and post data.
Hacker, D., Dole, J., Ferguson, M., Adamson, S., Roundy, L., & Scarpulla, L. (2015). The Short-Term and Maintenance Effects of Self-Regulated Strategy Development in Writing for Middle School Students. <i>Reading & Writing Quarterly</i>, 31(4), 351-372.	1. Population No outcomes reported for students with learning disabilities.
Kallio, H., Kallio, M., Virta, K., Liskala, T., & Hotulainen, R. (2021). Teachers' Support for Learners' Metacognitive Awareness. <i>Scandinavian Journal of Educational Research</i>, 65(5), 802-818.	3.Comparison: No pre and post data.
Klassen, R. (2010). Confidence to Manage Learning: The Self-Efficacy for Self-Regulated Learning of Early Adolescents with Learning Disabilities. <i>Learning Disability Quarterly</i>, 33(1), 19-30.	3.Comparison: No pre and post data.
Lucangeli, D., Fastame, M., Pedron, M., Porru, A., Duca, V., Hitchcott, P., & Penna, M. (2019). Metacognition and errors: The impact of self-	1. Population: Primary age students.

regulatory trainings in children with specific learning disabilities. <i>ZDM</i> , 51(4), 577-585.	
Mastropieri, M., Scruggs, T., Hamilton, S., Wolfe, S., Whedon, C., & Canevaro, A. (1996). Promoting Thinking Skills of Students With Learning Disabilities: Effects on Recall and Comprehension of Expository Prose. <i>Exceptionality : The Official Journal of the Division for Research of the Council for Exceptional Children</i> , 6(1), 1-11.	2. Intervention: Not a self-regulated learning or metacognitive focus.
Miranda, A., Arlandis, P., & Soriano, M. (1997). Instruccion en estrategias y entrenamiento atribucional: Efectos sobre la resolucion de problemas y el autoconcepto de los estudiantes con dificultades en el aprendizaje Instruction in strategies and attributional training: Effects on the problem-solving and self-concept of students' with learning disabilities. <i>Infancia Y Aprendizaje</i> , 20(4), 37-52.	1. Population: Primary age students.
Morosanova, V., Fomina, T., Kovas, Y., & Bogdanova, O. (2016). Cognitive and regulatory characteristics and mathematical performance in high school students. <i>Personality and Individual Differences</i> , 90, 177-186.	3.Comparison: No pre and post data.
Ness, B. M., & Sohlberg, M. M. (2013). Self-Regulated Assignment Attack Strategy: Evaluating the Effects of a Classroom-Level Intervention on Student Management of Curricular Activities in a Resource Context. <i>Learning Disabilities: A Contemporary Journal</i> , 11(1), 35–52.	4. Outcome: No quantitative academic outcomes assessed.
Popham, M., Adams, S., & Hodge, J. (2020). Self-Regulated Strategy Development to Teach	3.Comparison:

Mathematics Problem Solving. <i>Intervention in School and Clinic</i> , 55(3), 154-161.	No pre and post data.
Powell, S. D., & Makin, M. (1994). Enabling Pupils with Learning Difficulties to Reflect on Their Own Thinking. <i>British Educational Research Journal</i> , 20(5), 579–593. https://doi.org/10.1080/0141192940200506	3.Comparison: Qualitative analysis.
Pui, W. (2016). Differentiated Curriculum Design: Responding to the Individual and Group Needs of Students with Learning Difficulties with Self-regulated Learning Strategies. <i>Support for Learning</i> , 31(4), 329-346.	3.Comparison: Qualitative analysis.
Richie, G. (2005). Two Interventions that Enhance the Metacognition of Students with Disabilities: Cognitive Cue Cards and Correspondence Training. <i>Kairaranga</i> , 6(2), 25–32.	3.Comparison: No pre and post data.
Rosario, P., Nunez, J., Valle, A., Gonzalez-Pianda, J., & Lourenco, A. (2013). Grade level, study time, and grade retention and their effects on motivation, self-regulated learning strategies, and mathematics achievement: A structural equation model. <i>European Journal of Psychology of Education</i> , 28(4), 1311-1331.	3.Comparison: No pre and post data.
Şen, &. (2016). The Relationship Between Secondary School Students' Self-Regulated Learning Skills And Chemistry Achievement. <i>Journal of Baltic Science Education</i> , 15(3), 312.	3.Comparison: No pre and post data.
Şen, &., Yilmaz, A., & Geban, &. (2015). The Effects of Process Oriented Guided Inquiry Learning Environment on Students' Self-	1.Population:

Regulated Learning Skills. <i>Problems of Education in the 21st Century</i> , 66(1), 54-66.	No outcome data reported for learning disability students.
Swanson, H., & Trahan, M. (1996). Learning disabled and average readers' working memory and comprehension: Does metacognition play a role? <i>British Journal of Educational Psychology</i> , 66(3), 333-355.	3.Comparison: No pre and post data.

Appendix D

Weight of evidence A: Adaptations made to the ‘Essential and Desirable Quality Indicators for Group Experimental and Quasi-Experimental Research’ (Gersten et al., 2005).

The listed essential and desirable quality indicators from Gersten’s (2005) suggestions for assessing quality evidence-based research in special education were slightly adapted for the purpose of this review. Original wording is shown on the left and where changes were made they are shown on the right-hand side of the chart in italics. Small changes were made to enhance readability of the criteria, to make specific to this review focus or to separate criteria out for clarity.

To add further detail two of the desirable criteria on the original list (1 and 2) were split into two separate indicators, resulting in ten items. Gersten’s original criteria for desirable criteria was, therefore adapted from 4/10 to 5/10 for high, and 2/10 for medium alongside 9/10 for essential criteria. Low ratings remained at less than 9/10 for essential criteria as per the original.

Essential Quality Indicators

Quality indicators for describing participants

Original wording	<i>Adaptations are shown below.</i>
Was sufficient information provided to determine/confirm whether the participants demonstrated the disability(ies) or difficulties presented?	<i>Was sufficient information provided to determine or confirm whether participants demonstrated learning disabilities/difficulties?</i>
Were appropriate procedures used to increase the likelihood that relevant characteristics of participants in the sample were comparable across conditions?	<i>No changes made to the original</i>
Was sufficient information given characterising the interventionists or teachers provided? Did it indicate whether they were comparable across conditions?	<i>Was sufficient information given characterising the interventions (and/or teachers delivering the intervention) and whether they were comparable across conditions?</i>

Quality indicators for implementation of the intervention and description of comparison conditions

Original wording	<i>Adaptations are shown below.</i>
Was the intervention clearly described and specified?	<i>No changes made to the original</i>
Was the fidelity of the implementation described and assessed?	<i>No changes made to the original</i>
Was the nature of services provided in comparison conditions described?	<i>No changes made to the original</i>

Quality indicators for outcome measures

Original wording	<i>Adaptations are shown below.</i>
Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalised performance?	<i>No changes made to the original</i>
Were outcomes for capturing the intervention's effect measured at the appropriate times?	<i>No changes made to the original</i>

Quality indicators for data analysis

Original wording	<i>Adaptations are shown below.</i>
Were the data analysis techniques appropriately linked to key research questions and hypotheses? Were they appropriately linked to the unit of analysis in the study?	<i>No changes made to the original</i>
Did the research report include not only inferential statistics but also effect size calculations?	<i>No changes made to the original</i>

Desirable Quality Indicators

Original wording	<i>Adaptations are shown below.</i>
Was data available on attrition rates among intervention samples? Was severe overall attrition documented? If so, is attrition comparable across samples? Is overall attrition less than 30%?	<i>Was data made available about attrition rates among the intervention samples? AND If attrition rate was reported was it below 30%?</i>
Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures? Were data collectors and/or scorers blind to study conditions and equally (un)familiar to examinees across study conditions?	<i>Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures? AND Were data collectors and/or scorers blind to study conditions and equally (un)familiar to examinees across study conditions?</i>
Were outcomes for capturing the interventions' effect measured beyond the immediate post-test?	<i>No changes made to the original</i>
Was evidence of the criterion-related validity and construct validity of the measures provided?	<i>No changes made to the original</i>
Did the research team assess not only surface features of fidelity implementation (e.g. number of minutes allocated to the intervention or teacher/interventionist following procedures specified), but also examine the quality of the intervention?	<i>Did the research team assess both surface features of fidelity implementation (e.g. number of minutes allocated to the intervention) and also the quality of the intervention?</i>
Was any documentation of the nature of instruction or series provided in the comparison conditions?	<i>No changes made to the original</i>
Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?	<i>No changes made to the original</i>

Were the results presented in a clear, coherent fashion?	<i>No changes made to the original</i>
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WoE Rating	Criteria
3 – High	Research study meets 9/10 of the essential criteria and at least 5/10 of the desirable criteria.
2 – Medium	Research study meets 9/10 of the essential criteria and at least 2/10 of the desirable criteria.
1 – Low	Research study does not meet 9/10 of the essential criteria.

Appendix E

Weight of evidence A coding example for included experimental and quasi-experimental studies.

Essential and Desirable Quality Indicators for Group Experimental and Quasi-Experimental Research (adapted from Gersten et al., 2005)

Study:

Berkeley, S., Mastropieri, M., & Scruggs, T. (2011). Reading Comprehension Strategy Instruction and Attribution Retraining for Secondary Students With Learning and Other Mild Disabilities. *Journal of Learning Disabilities*, 44(1), 18-32.

Essential Quality Indicators

Quality indicators for describing participants

	Yes (1)	No (0)	Unable to code (0)
Was sufficient information provided to determine or confirm whether participants demonstrated learning disabilities/difficulties?	yes		
<i>Were appropriate procedures used to increase the likelihood that relevant characteristics of participants in the sample were comparable across conditions?</i>	Yes		
<i>Was sufficient information given characterising the interventions (and/or teachers delivering the intervention) and whether they were comparable across conditions?</i>	yes		

Quality indicators for implementation of the intervention and description of comparison conditions

	Yes (1)	No (0)	Unable to code (0)
Was the intervention clearly described and specified?	yes		
Was the fidelity of the implementation described and assessed?	yes		
Was the nature of services provided in comparison conditions described?	yes		

Quality indicators for outcome measures

	Yes (1)	No (0)	Unable to code (0)
Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalised performance?	Yes		
Were outcomes for capturing the intervention's effect measured at the appropriate times?	Yes		

Quality indicators for data analysis

	Yes (1)	No (0)	Unable to code (0)
Were the data analysis techniques appropriately linked to key research questions and hypotheses? Were they appropriately linked to the unit of analysis in the study?	Yes		
Did the research report include not only inferential statistics but also effect size calculations?	yes		

Desirable Quality Indicators

	Yes (1)	No (0)	Unable to code (0)
Was data made available about attrition rates among the intervention samples?	yes		
If attrition rate was reported was it below 30%?	yes		
Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures?	Yes		
Were data collectors and/or scorers blind to study conditions and equally (un)familiar to examinees across study conditions?	Yes		
Were outcomes for capturing the interventions' effect measured beyond the immediate post-test?	Yes		
Was evidence of the criterion-related validity and construct validity of the measures provided?	Yes		
Did the research team assess both surface features of fidelity implementation (e.g. number of minutes allocated to the intervention) and also the quality of the intervention?	yes		
Was any documentation of the nature of instruction or series provided in the comparison conditions?	Yes		
Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?	Yes		
Were the results presented in a clear, coherent fashion?	Yes		

Essential and desirable quality indicators scoring	
<i>Describing participants (max 3)</i>	3
<i>Intervention implementation (max 3)</i>	3
<i>Outcome measures (max 2)</i>	2
<i>Data Analysis (max 2)</i>	2
Total number of essential quality indicators (/10)	10
Total number of desirable quality indicators (/10)	10
WoE A Rating	High - 3

Appendix F

Weight of evidence A: Adaptations made to the Quality Indicators within Single-subject Research checklist (Horner et al., 2005).

Amendments are shown below for three indicators listed by Horner et al. (2005) these are marked by an asterisk. Two indicators have been adapted to support the use of the descriptors to screen papers. The third item has been removed from the social validity section as it was perceived to overlap with the first item in that grid and include a subjective assessment of magnitude of impact. Items deleted are shown in square brackets and items replaced are shown in round brackets. The amendments resulted in an overall top potential score of 20. The weight of evidence ratings were determined for this review and were not suggested by Horner et al. (2005). These ratings were intended to be high scoring for a high rating in order to recognise those studies that have met most of the criteria.

Description of participants and settings

	Yes (1)	No (0)	Unable to code (0)
Participants are described with sufficient detail to allow others to select individuals with similar characteristics (e.g. age, gender, disability, diagnosis).			
<i>The process for selecting participants is described with replicable precision.</i>			
<i>Critical features of the physical setting are described with sufficient precision to allow replication.</i>			

Dependent variable

	Yes (1)	No (0)	Unable to code (0)
Dependent variables are described with operational precision.			
Each dependent variable is measured with a procedure that generates a quantifiable index			
Measurement of the dependent variable is valid and described with replicable precision.			

Dependent variables are measured repeatedly over time.			
Data are collected on the reliability or interobserver agreement associated with each dependent variable, and IOA levels meet minimal standards (e.g., IOA = 80%; Kappa = 60%).			

Independent variable

	Yes (1)	No (0)	Unable to code (0)
Independent variable is described with replicable precision.			
Independent variable is systematically manipulated and under the control of the experimenter.			
*Overt measurement of the fidelity of implementation for the independent variable is [highly desirable] (reported clearly).			

Baseline

	Yes (1)	No (0)	Unable to code (0)
*[The majority of single-subject research studies will include a baseline phase that provides repeated measurement of a dependent variable and establishes a pattern of responding that can be used to predict the pattern of future performance, if introduction or manipulation of the independent variable did not occur.]			

(The single-subject research study includes a baseline phase providing repeated measurement of a dependent variable and establishing a pattern of responding that can be used to predict the pattern of future performance, if introduction or manipulation of the independent variable did not occur.)			
Baseline conditions are described with replicable precision.			

Experimental control/internal validity

	Yes (1)	No (0)	Unable to code (0)
The design provides at least three demonstrations of experimental effect at three different points in time.			
The design controls for common threats to internal validity (e.g., permits elimination of rival hypotheses).			
The results document a pattern that demonstrates experimental control.			

External validity

	Yes (1)	No (0)	Unable to code (0)
Experimental effects are replicated across participants, settings, or materials to establish external validity.			

Social validity

	Yes (1)	No (0)	Unable to code (0)
The dependent variable is socially important.			
*[The magnitude of change in dependent variable resulting from the intervention is socially important.]			
Implementation of the independent variable is practical and cost effective.			
Social validity is enhanced by implementation of the independent variable over extended time periods, by typical intervention agents, in typical physical and social contexts.			

Quality indicators scoring	
<i>Description of participants and setting (max 3)</i>	
<i>Dependent variable (max 5)</i>	
<i>Independent variable (max 3)</i>	
<i>Baseline (max 2)</i>	
<i>Experimental control/internal validity (max 3)</i>	
<i>External validity (max 1)</i>	
<i>Social validity (max 3)</i>	

Total quality indicator score (max 20)	
WoE A Rating	

WoE Rating	Criteria
3 – High	Research study meets 17/20 of the quality indicators.
2 – Medium	Research study meets between 12/20 – 16/20 of the quality indicators.
1 – Low	Research study does not meet 12/20 of the quality indicators.

Appendix G

Weight of evidence A coding example for included single-experimental case design studies

Quality Indicators within Single-subject Research checklist (Horner et al., 2006).

Study:

Büyüknarci, Ö., & Grünke, M. (2019). The Effects of a Metacognitive Strategy on the Persuasive Writing Skills of Adolescents with Hearing Impairment and Learning Disabilities. *Insights into Learning Disabilities*, 16(2), 139–152.

Description of participants and settings

	Yes (1)	No (0)	Unable to code (0)
Participants are described with sufficient detail to allow others to select individuals with similar characteristics (e.g. age, gender, disability, diagnosis).	yes		
<i>The process for selecting participants is described with replicable precision.</i>		no	
<i>Critical features of the physical setting are described with sufficient precision to allow replication.</i>		no	

Dependent variable

	Yes (1)	No (0)	Unable to code (0)
Dependent variables are described with operational precision.	yes		
Each dependent variable is measured with a procedure that generates a quantifiable index	yes		

Measurement of the dependent variable is valid and described with replicable precision.	yes		
Dependent variables are measured repeatedly over time.	yes		
Data are collected on the reliability or interobserver agreement associated with each dependent variable, and IOA levels meet minimal standards (e.g., IOA = 80%; Kappa = 60%).	yes		

Independent variable

	Yes (1)	No (0)	Unable to code (0)
Independent variable is described with replicable precision.		no	
Independent variable is systematically manipulated and under the control of the experimenter.			Unable to code
Overt measurement of the fidelity of implementation for the independent variable is reported clearly.	yes		

Baseline

	Yes (1)	No (0)	Unable to code (0)
The single-subject research study includes a baseline phase providing repeated measurement of a dependent variable and establishing a pattern of responding that can be used to predict the pattern of future performance, if introduction or manipulation of the independent variable did not occur.		no	
Baseline conditions are described with replicable precision.		no	

Experimental control/internal validity

	Yes (1)	No (0)	Unable to code (0)
The design provides at least three demonstrations of experimental effect at three different points in time.	yes		
The design controls for common threats to internal validity (e.g., permits elimination of rival hypotheses).		no	
The results document a pattern that demonstrates experimental control.		no	

External validity

	Yes (1)	No (0)	Unable to code (0)
Experimental effects are replicated across participants, settings, or materials to establish external validity.	yes		

Social validity

	Yes (1)	No (0)	Unable to code (0)
The dependent variable is socially important.	yes		
Implementation of the independent variable is practical and cost effective.		no	
Social validity is enhanced by implementation of the independent variable over extended time periods, by typical intervention agents, in typical physical and social contexts.		no	

Quality indicators scoring	
<i>Description of participants and setting (max 3)</i>	1
<i>Dependent variable (max 5)</i>	5
<i>Independent variable (max 3)</i>	1
<i>Baseline (max 2)</i>	0
<i>Experimental control/internal validity (max 3)</i>	1
<i>External validity (max 1)</i>	1
<i>Social validity (max 3)</i>	1
Total quality indictor score (max 20)	10
WoE A Rating	Low = 1

Appendix H

Weight of evidence B: Review specific evaluation.

Question		Coding for each question.		
2. Is it a whole class intervention?		Yes, whole class. (2)	No, small group or one to one. (1)	
3. What elements of self-regulated learning (Planning, monitoring and evaluation) were included and explicitly referred to?		All three. (3)	Two elements. (2)	One element. (1)
4. Was the intervention carried out by a teacher/member of school staff?		Yes (2)	No (1)	
1. Is there any assessment of maintenance or follow up gains in academic outcomes that would suggest the procedures have been internalised?		Yes, more than one month. (3)	Yes, less than one month. (2)	No. (1)
High	Medium	Low		
9-10	6-8	0-5		

Appendix I

Weight of evidence B coding for all included studies.

Study	Type of research	Is it a whole class/group intervention?	What elements of SRL (Planning, monitoring and evaluation) were included and explicitly referred to?	Was the intervention carried out by a teacher/member of school staff?	Is there any assessment of maintenance or follow up gains in academic outcomes that would suggest the procedures have been internalised?	weight of evidence B score
Berkeley et al. (2011)	randomised, pre and post experimental design	No small group (1)	all three elements (3)	A mix (1)	yes 6 weeks (3)	8/10 (medium)
Berkeley, Marshak et al. (2011)	randomised, pre and post experimental design	yes, whole class (2)	all three elements (3)	yes (2)	no (1)	8/10 (medium)
Büyüknarci & Grünke. (2019)	Case study: multiple baseline design	No, small group (1)	two elements (planning and monitoring) (2)	no (0)	no (1)	4/10 (low)

Study	Type of research	Is it a whole class/group intervention?	What elements of SRL (Planning, monitoring and evaluation) were included and explicitly referred to?	Was the intervention carried out by a teacher/member of school staff?	Is there any assessment of maintenance or follow up gains in academic outcomes that would suggest the procedures have been internalised?	weight of evidence B score
Cuenca-Carlino et al. (2016)	Case study: multiple baseline design	No, small group (1)	all three elements (SRSD) (3)	yes (2)	yes, more than 1 month (5th and 6th week) (3)	9/10 (High)
Firat, T. (2019)	Case study: multiple baseline design	No, small group (1)	all three elements (3)	unclear who delivered the instruction (0)	yes, at 3 and 6 weeks (3)	7/10 (medium)
Gomaa, 2016	randomised, pre and post experimental design	yes, whole class (2)	Three elements implied ("metacognitive strategies") but not described (2)	yes (2)	yes 1 month (2)	8/10 (medium)

Study	Type of research	Is it a whole class/group intervention?	What elements of SRL (Planning, monitoring and evaluation) were included and explicitly referred to?	Was the intervention carried out by a teacher/member of school staff?	Is there any assessment of maintenance or follow up gains in academic outcomes that would suggest the procedures have been internalised?	weight of evidence B score
Hacker et al. (2019)	randomised, pre and post experimental design	yes, whole class (2)	all three elements (3)	yes (2)	no (1)	8/10 (medium)
Hoover et al. (2012)	Case study: multiple baseline design	No, small group (1)	all three elements (SRSD) (3)	yes (2)	yes, within 1 month (2)	8/10 (medium)
Lizarraga & Iriarte, (2001)	quasi-experimental pre and post-test design	yes, whole class (2)	Three elements implied ("self-regulated learning") but not described (2)	no (0)	no (1)	5/10 (low)

Study	Type of research	Is it a whole class/group intervention?	What elements of SRL (Planning, monitoring and evaluation) were included and explicitly referred to?	Was the intervention carried out by a teacher/member of school staff?	Is there any assessment of maintenance or follow up gains in academic outcomes that would suggest the procedures have been internalised?	weight of evidence B score
Montague, M. (1992)	Case study: multiple baseline design	No, small group (1)	all three elements (3)	no (0)	yes, more than 1 month (end of school year and start of following school year) (3)	7/10 (medium)
Weisberg & Balajthy. (1990)	quasi-experimental pre and post-test design	yes, whole class (2)	Three elements implied ("metacognitive self-monitoring strategies") but not described (2)	no, not specified (0)	no (1)	5/10 (low)

Appendix J

Weight of evidence C.

Assessment for WoE C: relevance of the study to the review question and the context of how and where the research had taken place.

Type of sample: all studies included school age children ranging from 11 years to 18 years old due to the inclusion criteria. Some of the single case experimental design studies included a range of pupils who were below 11 years of age as part of their sample.

Issues of validity were assessed by WoE A coding protocols (Appendix D and F) and so are not included in this assessment. A relevant additional consideration was that some research reported the outcomes of students with learning disabilities as part of whole class interventions and others included whole class data without specific information on student learning profiles. In contrast some research only focused on learning disability cohorts and did not show applicability of use in whole-class groups.

Weight of evidence C codes are;

Low = 1

Medium = 2

High = 3

Study	Weight of Evidence C
Berkeley et al. (2011)	2/3 Medium
Berkeley, Marshak et al. (2011)	1/3 Low

Study	Weight of Evidence C
Büyüknarci & Grünke (2019)	2/3 Medium
Cuenca-Carlino et al. (2016)	2/3 Medium
Firat, T. (2019)	Medium (2/3)
Gomaa (2016)	High (3/3)
Hacker et al. (2019)	Low (1/3)
Hoover et al. (2012)	Medium (2/3)
Lizarraga & Iriarte (2001)	High (3/3)
Montague, M. (1992)	Medium (2/3)
Weisberg & Balajthy (1990)	Medium (2/3)

Appendix K

Weight of evidence D: Overall assessment of weight of evidence calculations.

WoE A, B and C are considered equally important to the overall ratings of the study and as such all are equally contributing to the WoE D judgement.

WoE A, B and C indicators	WoE D judgements made.
When two WoE indicators are the same:	WoE D will be assessed as the mode. Exceptions: if the mode is 'low' and the third weighting is 'high' medium will be attributed to WoE D in order to reflect the 'high' judgement. if the mode is 'high' and the third weighting is 'low' medium will be attributed to WoE D in order to reflect the 'low' judgement.
When all three indicators are different.	WoE D will be assessed as Medium.

Study	Weight of Evidence D
Berkeley et al. (2011)	Medium
Berkeley, Marshak et al. (2011)	Medium
Büyüknarci & Grünke (2019)	Low
Cuenca-Carlino et al. (2016)	High
Firat, T. (2019)	Medium
Gomaa (2016)	Medium
Hacker et al. (2019)	Low
Hoover et al. (2012)	Medium
Lizarraga & Iriarte (2001)	Medium
Montague, M. (1992)	Medium
Weisberg & Balajthy (1990)	Low

Appendix L

Information and recruitment poster.

Would you like two free workshops on self-regulated learning?

What is Self-regulated learning (SRL) includes techniques that support students to think about how they learn and reflect on the learning process to improve and be more independent learners. This promotes a positive context for students to learn in as it assumes that everyone can learn. The education endowment foundation suggests SRL techniques create student progress gains of up to 7 months.

Changes do not need to be made to content delivery or schemes of learning. The SRL techniques are incorporated into existing plans and are expected to draw out conversations with students about their perceptions of themselves as learners and how they learn; this can help identify how teachers can support students. Understanding what students think about themselves as learners gives opportunities to challenge negative narratives that may be affecting their motivation.

What would your teaching staff need to do?

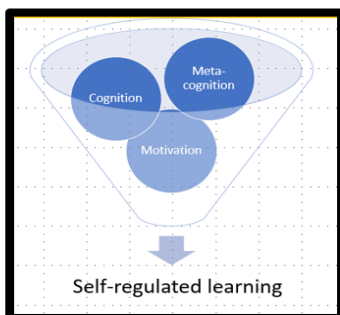
Week one	Week 3 or 4	Week 8
Attend a 90-minute workshop on SRL. Complete two questionnaires. Try out some of the ideas in lessons.	Attend 2nd 90-minute workshop on SRL and feedback on how it is going. Try out ideas in lessons and complete a fidelity check questionnaire.	Attend an hour focus group feedback to let me know how easy/hard it was to deliver the ideas into the subject specialism. Complete 2 final questionnaires.

If this sounds useful for your school...

Email (email address removed) for a Headteacher consent form. Once this is completed I can send you a link to share with interested staff to sign up directly with me. We can plan which dates to deliver the training would best suit your school.

[Ethical data handling and permissions:](#) All data will be collected and stored anonymously using codes to replace names and schools. All processes have been cleared by the UCL ethics committee.

Appendix M Summary Poster for Developing Self-regulated Learning Workshop Content.



Reframe mistakes.

Humans are designed to learn the 'gist' rather than details. It's normal to get detail wrong on first recall.

Attribution theory.

Model and reinforce the value that success is about effort.

Adolescent development.

Feelings of shame are hard to shake off. Provide options and foster two-way respect through curious questions.

Model regulation.

Become aware of your own shark music.



Identify key elements of your course that are easy wins

Cognition.

- Learning is when we recall or use information at a different point in time from when it was first experienced.
- Working memory can only hold a few items (5-9) of new information at a time; chunking information and using mnemonics can help the brain hold onto the information and make it more likely to be processed and then remembered.
- Successful learners put in a lot of effort (repetition) in and this affects their outcomes
- Because we can't see the effort put in by other learners (and teachers), we might accidentally think that learning is easy for them.
- To improve we need to be able to make mistakes; these will show us what we need help with and what we find challenging.

Retrieval practice: review key concepts over the year, **Spacing:** over time leave bigger time gaps when you revisit information, **Cognitive load:** deliver learning in small chunks to avoid overloading working memory.

Meta Cognition.

- Highlight to students where you are using planning, monitoring and evaluation as part of your learning cycles to model this approach to learning (how are you metacognitive about your own work load?).
- Provide opportunities for students to plan their work out (writing frames are good examples of this for longer answers).
- Provide opportunities for students to monitor how they are getting on (through questioning and after short assessments reflect on their own targets).
- Provide opportunities for students to evaluate their own work against the mark schemes and assessment criteria wherever possible.
- Try out different revision or learning techniques with the class then ask them to feed back on how useful they found them.

Planning.

Monitoring.

Evaluation.

Motivation.

- **Weiner's theory of attribution:** if we expect to fail or succeed at a task will determine how much effort we are willing to put in.
- **Dweck's- growth mindset:** Everyone can learn with the right support in place and the belief in that philosophy; adapt tasks that students find hard to help them access success through effort.
- **Vygotsky's zone of proximal development:** is the learning task focused in 'what I can do with support' space for all learners?
- **Model regulation in your classroom:** name feelings of irritation and frustration when you feel it and see it and show your class how to manage those natural and difficult experiences.
- **The adolescent audience:** this is a time of wanting to feel aligned with peers (not adults), seeking autonomy and agency. Offer choices rather than ultimatums, remain aware of the heightened embarrassment that perceived failure in front of peers can bring.

From EFF meta-cognition and self-regulation: what should I consider?

- ☐ Select explicit strategies you can teach your pupils to help them plan, monitor, and evaluate specific aspects of their learning.
- ☐ Give them opportunities to use these strategies with support, and then independently.
- ☐ Set an appropriate level of challenge to develop pupils' self-regulation and metacognition in relation to specific learning tasks?
- ☐ Promote and develop metacognitive talk related to your lesson objectives?
- ✓ Undertake professional development to develop your knowledge and understanding of these approaches.

Education endowment foundation website:
<https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/meta-cognition-and-self-regulation/>

Appendix O

Teacher self-efficacy Scale short form (Tschannen-Moran & Woolfolk Hoy, 2001)

Removed prior to binding

Appendix P

Teacher Attitudes to Self-regulated Learning (Steinbach & Stoeger, 2018)

Rate the following statements: using the 1-6 scale, where 1 means completely disagree and 6 means completely agree.

1	2	3	4	5	6
Completely disagree	Somewhat disagree	Slightly agree	Slightly agree	Somewhat agree	Completely agree

Scale removed prior to binding.

Appendix Q Fidelity questionnaires

UCL EDUCATIONAL PSYCHOLOGY GROUP RESEARCH DEPARTMENT OF CLINICAL, EDUCATIONAL & HEALTH PSYCHOLOGY

Dear teacher,

The following chart is to be completed after workshop 2.

This checklist has been designed as a fidelity self-report checklist for teachers developed based on principles from Bishop et al. (2014) paper.

As reminder of what elements, you should be thinking about when you complete this grid I have outlined the three key principles of SRL below.

***Self-regulated learning (SRL) principles include:**

1. **Cognition:** Discussions about how people learn, including the teacher modelling how they learn/learnt or students discussing elements of theory and applying it in practice.
Strategies to improve learning: this could include a recap at the start of the lesson or advice on how to organise work, advice on how to study at home
2. **Metacognition:** Evidence of reflection on what worked, what did not work and thoughts on why and/or use of this reflection in target setting. This can include conversations as well as activities for reflections.
3. **Motivation:** Evidence of teacher questioning that helps students to identify how much time and effort they have applied and how it relates to outcomes (for example, noticing an outcome has improved after effort, recognising a test result is lower due to absence not effort of pupil).

Bishop et al. fidelity characteristics		No	Some of the time	Most of the time	Yes
Adherence	Cognition				
Were you able to use the following SRL* techniques in your lessons?	Metacognition				
	Motivation.				
Quality of delivery	Cognition				
Did students appear to understand and make use of strategies that you introduced?	Metacognition				
	Motivation.				

Student engagement					
Do you think students liked using the strategies?					
Dosage	How many different classes do you teach?				
	How many of these classes have you tried out the strategies with?				
	Thinking about the class you have used the techniques the most with, approximately how many lessons have you made use of or referred to the techniques in?	out ofclasses			
Adaptations	Have you used the techniques that were described in the planning sessions?				
	If you have made changes what sort of changes have you made?				

Thank you for completing this fidelity check.

Kind regards,

School one Fidelity checklist Response.

Adapted from Bishop et al. (2014)		
Adherence: were you able to use the following strategies in your lesson...?	Cognition	Yes
	Metacognition	Yes
	Motivation	Yes
Quality of delivery: Did students appear to make use of and understand..	...the cognition strategies that you used?	Most of the time
	...the metacognitive strategies you used?	Some of the time
	...the motivation strategies that you used?	Some of the time
Student engagement: Do you think students liked using...?	...the cognition strategies?	Some of the time
	...the metacognition strategies?	Some of the time
Dosage: Pick one class that you focused on the most and answer the following questions on that class.	How many times per week did you see this class?	3 periods
	What has the attendance for the class been over the week?	High
	Approximately how many of those lesson have you made use of or referred to SRL techniques in?	1 or 2
Adaptations	Have you made changes to the strategies mentioned in the workshops to suit your subject area? If you have can you say a little bit about how you have done that and what subject area changes were?	Yes, I have spent more time explaining why certain revision strategies are useful for different outcomes

School two Fidelity Checklist Responses.

Adapted from Bishop et al. (2014)		
Adherence: were you able to use the following strategies in your lesson...?	Cognition	Some of the time Most of the time (2)
	Metacognition	Yes Most of the time Some of the time
	Motivation	Most of the time (2) Some of the time
Quality of delivery: Did students appear to make use of and understand..	...the cognition strategies that you used?	Yes Most of the time Some of the time
	...the metacognitive strategies you used?	Yes most of the time (2)
	...the motivation strategies that you used?	Yes Some of the time (2)
Student engagement: Do you think students liked using...?	...the cognition strategies?	Some of the time (3)
	...the metacognition strategies?	Yes Some of the time Most of the time
Dosage: Pick one class that you focused on the most and answer the following questions on that class.	How many times per week did you see this class?	Twice a week (2) 3 lessons each week
	What has the attendance for the class been over the week?	955 90-95% 89%
	Approximately how many of those lesson have you made use of or referred to SRL techniques in?	8 2 Tried in all
Adaptations	Have you made changes to the strategies mentioned in the workshops to suit your subject area? If you have can you say a little bit about how you have done that and what subject area changes were?	Only small changes in the way I explained things as the lessons progressed.

School three Fidelity Checklist Responses.

Adapted from Bishop et		
al. (2014)		
Adherence: were you able to use the following strategies in your lesson...?	Cognition	Some of the time (3) Most of the time (5)
	Metacognition	Some of the time (3) Most of the time (5)
	Motivation	Some of the time (1) Most of the time (5) Yes (1)
Quality of delivery: Did students appear to make use of and understand..	...the cognition strategies that you used?	Some of the time (2) Most of the time (5)
	...the metacognitive strategies you used?	Some of the time (4) Most of the time (4)
	...the motivation strategies that you used?	Some of the time (2) Most of the time (4)
Student engagement: Do you think students liked using...?	...the cognition strategies?	Some of the time (1) Most of the time (2) Yes (4)
	...the metacognition strategies?	Yes (1)
Dosage: Pick one class that you focused on the most and answer the following questions on that class.	How many different classes do you teach?	One course, 5, 4, 3, 5, 6, 3
	How many different classes have you tried out your strategy with	All (5) 2/5 Half
	Thinking about the class you have used the techniques the most with, approximately how many of those lesson have you made use of	All (3) 1\3, 5\7, 7\10, 3\5

	or referred to SRL techniques in?	
Adaptations	Have you made changes to the strategies mentioned in the workshops to suit your subject area? If you have can you say a little bit about how you have done that and what subject area changes were?	Tried to make more engaging starters to warm up students. Adapted my language, explained how and why I'm teaching certain skills, used graphic organisers Yes, thinking more about student voice and them identifying their targets more.

Appendix R

Post intervention Focus group meeting - standard script.

Introduction:

Thank you all for coming along to this focus group discussion today. This session is for you to feedback to me your experiences of participation in the workshops and about your classroom implementation of self-regulated learning.

Before we begin, I want to remind you that all of the conversations that we have today should be kept confidential, which means it wouldn't be appropriate to share the details of the discussions outside of this room. In particular to share names and comments made, this is to ensure that you all feel able to share honestly from your experiences over the last 8 weeks.

Although I am recording the session the transcription process will not include any names or identifying information and as other schools are being asked to give their views in other focus group it is unlikely that your comments are identifiable in the analysis. For the information that we discuss to remain confidential, I will need to rely on each of you to stick to this agreement and therefore can't guarantee that the information will be completely confidential – that depends on the group as a whole keeping the information to themselves.

Along with confidentiality, another key aspect of the focus group is that of respect for one another and the views that are discussed. There are no right, or wrong answers and we are seeking to explore our views together.

It is really important that everyone feels able to offer their feedback and that we recognise that as many of you are teaching different subjects it is highly likely that your experiences of this process will be different and that is absolutely fine. In order to support future research into developing interventions with teachers it is also completely fine and encouraged for you to share negative as well as positive experiences even if you feel these may only apply to you. Any feedback and reflections may support future interventions and ensure that educational psychologists take all factors into account when suggesting training and interventions in secondary schools.

With your permissions I will record the conversation, I will allocate a number to you and note that down just to link your own comments together for when I transcribe.

I anticipate this session to last up to one hour. In that time, I would like to ask you about any impact of the workshops on your teaching practice, how you managed delivery of the techniques and any barriers that you perceived to their use over time. If we finish before that

we will stop early. Has anyone got any questions or things that they would like clarifying before we start?

Focus group Draft questions

Research question 1 : Reported self-efficacy on use of SRL

- How confident did you feel in being able to deliver the three elements of SRL that we discussed in the workshops (Cognition, metacognition and motivation of learners through language and questions).
- How confident would you feel in explaining these techniques to another member of staff?

Research question 2: Teacher attitudes towards SRL

- Did you feel that the focus on self-regulated learning techniques and ideas led to an improvement in your students' academic achievement?
- Did anyone notice an impact on student's confidence in study techniques?
- Are there any examples of where a particular student appeared to benefit from a technique you were using?
- Are there any examples of where a particular student appeared to not benefit?

Research question 3a and 3b: facilitators and barriers

- Were there elements that you found easier to incorporate into your subject area/teaching than others?
- Were there any barriers to using these techniques in your subject area and can you explain why it is a barrier?

Rationale for Focus group question development.

Research question 1	To get teachers to reflect on their confidence levels at delivering SRL strategies to students as part of lessons.
Research questions 2	To ask questions that would elicit teachers attitudes towards SRL.
Facilitators and barriers questions	To directly ask questions about barriers to encourage honest reflection for those who may not have found the SRL strategies easy to incorporate.

Appendix S

Information and consent forms for Headteachers



Self-regulated Learners workshops school information and consent form

Information sheet for schools

UCL Research Ethics Committee Approval ID Number: 21265/001

Title of Study: An exploration of the implementation of self-regulated learning principles among secondary school teachers.

Department: Research Department of Clinical, Health and Educational Psychology

Name and Contact Details of the Researcher(s): Steph Little
(stephanie.little.20@ucl.ac.uk)

Name and Contact Details of the Principal Researcher: Dr Jessica Dewey
(Jessica.dewey@ucl.ac.uk)

Contact Details of the UCL Data Protection Officer: Alex Pots - data-protection@ucl.ac.uk

This study has been approved by the UCL Research Ethics Committee: Project ID number: 21265/001

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Dear (Headteacher),

I am a trainee educational psychologist working for Hertfordshire County Council. I am studying at University College London, as part of my training I will complete a piece of research to submit as part of my thesis and which I hope to publish for wider benefit. I am writing to invite your school to participate in my research.

I am interested in self-regulated learning techniques because the Education Endowment Foundation suggests that these techniques can help students make improvements of up to 7 months progress. I would like to know what are the facilitators and barriers for teachers in delivering these strategies to classes and incorporating the concepts into their planning.

I intend to bring to the training ideas on how to create an environment that uses the principles of self-regulated learning and at the same time would not increase the burden on teachers work load. Teachers would be encouraged to adapt ideas to fit their curriculum area and feedback on the feasibility of the ideas.

What would happen if the school decides to take part?

Headteachers complete this consent form. I would send out teacher consent forms and set up a date to deliver the two workshops. Teachers would need to feedback on their experience of being trained and using the strategies in their lessons.

What will the project involve for teachers?

1 st	3 rd
Week one: 90 min workshop on SRL	Week 8: focus group feedback meeting.
2 nd	
Week 3 or 4: 90 min workshop on SRL (in school or online)	
Completing 2x questionnaires	Completing 2x questionnaires

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The school and the teachers will not be identifiable in the research analysis or write up.

In the training sessions I would explain what self-regulated learning involves, the theory behind the strategies for learning and how it might be used in a classroom across a set of lessons. Time would be set aside to plan how it could be incorporated into schemes of learning without changing order of delivery of the curriculum.

The SRL training will be made up of three core elements: Cognition, metacognition and motivation of pupils through language and the use of questioning.

How would staff be supported?

Staff would attend two workshops with opportunities to discuss and plan how to implement self-regulated learning into their classroom routines. They would receive ideas, support and resources about how to do this and would be able to ask questions via email during the intervention. At the end of the intervention period (around 8 weeks) staff will be able to feedback how they found the process and what elements they did or did not find helpful or useful.

What are the potential benefits or risks of taking part?

Potentially staff may decide to spend time on this project that is more than anticipated which may remove them from other tasks.

There is no hidden agenda nor is any area of the research withheld from you until the end of the process and questions are welcome throughout the process of the research.

You would retain the right to withdraw from the research process at any time throughout the eight weeks and for two weeks following the end of the data collection process. This research has been through an independent ethics application process at UCL before starting the project, all materials and information that you receive have been checked to meet ethical standards of research in order to ensure minimal risks to your school by taking part.

Do the school have to take part?

No, not at all. Taking part in this research project is completely voluntary.

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If you are happy to host the research at your school, I can share a recruitment flyer with initial information, answer questions at a staff meeting or send a video link to an explanation that you can play to staff to consider participation in the project. All staff would receive an information sheet and sign a consent form if they agreed to become involved.

Data protection privacy notice.

The data controller for this project will be University College London (UCL). The UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted at data-protection@ucl.ac.uk

Your personal data will be processed for the purposes outlined in this notice.

The legal basis that would be used to process your personal data will be performance of a task in the public interest.

Your personal data will be processed so long as it is required for the research project. I will pseudonymise the personal data you provide – this means I will not record your name.

If you are concerned about how your personal data is being processed, please contact UCL in the first instance at data-protection@ucl.ac.uk. If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: <https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/>

Further information.

If you have any further questions you can direct them to Stephanie Little (stephanie.little.20@ucl.ac.uk) who is being supervised by Dr Jessica Dewey, UCL (jessica.dewey@ucl.ac.uk)

Kind regards,

Stephanie Little – Trainee educational psychologist at UCL

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(stephanie.little.20@ucl.ac.uk)

Supervisor: Dr Jessica Dewey, UCL (jessica.dewey@ucl.ac.uk)

I have read and understood the information on this page * *Required*

Consent form and contact details

What is the name of your school? * *Required*

If you agree that your staff can participate in this research project please tick the 'I agree' option from the boxes below. You will also be offered the option of asking for further information. If you agree to participate as a school I will send out recruitment information for your staff. * *Required*

Getting ready for recruitment

If you have agreed for your school to participate, please could you leave the name, job role and email address of the person who you would like to be a point of contact for recruitment and setting up dates for the workshops.

How to get more information

If you would like more information before agreeing to start the recruitment process please leave your email address and I will get back to you to arrange a time to talk.

Feedback

If you have made the decision not to participate it would be really helpful feedback for my research if you could let me know what sort of factors influenced that decision. In particular it is helpful for me to know if you feel that your staff are already using self-regulated learning training in their teaching practice, if you feel there is not enough time, if you do not like the principles of SRL etc. All of this information is really helpful.

Thank you

Thank you for taking the time to read about my research proposal. If you have any questions at all do get in contact with me using the email address stephanie.little@hertfordshire.gov.uk

Key for selection options

1 - I have read and understood the information on this page
yes

3 - If you agree that your staff can participate in this research project please tick the 'I agree' option from the boxes below. You will also be offered the option of asking for further information. If you agree to participate as a school I will send out recruitment information for your staff.

I agree that you can recruit staff in my school for your research study and deliver the SRL workshops.
I am interested in the research however I have more questions and will email you to arrange a time to talk.
I do not agree to you recruiting staff from my school to participate in the SRL workshops.

Appendix T

Information and consent forms for teachers

Self-regulated learners Workshop teacher information and consent form

Information for teachers

Participant Information Sheet for Teachers

UCL Research Ethics Committee Approval ID Number: 21265/001

Title of Study: An exploration of the implementation of self-regulated learning principles among secondary school teachers.

Department: Research Department of Clinical, Health and Educational Psychology

Name and Contact Details of the Researcher: Steph Little
(stephanie.little.20@ucl.ac.uk)

Name and Contact Details of the Principal Researcher: Dr Jessica Dewey
(jessica.dewey@ucl.ac.uk)

Contact Details of the UCL Data Protection Officer: Alex Potts [data-
protection@ucl.ac.uk](mailto:dataprotection@ucl.ac.uk)

This study has been approved by the UCL Research Ethics Committee: Project ID number: 21265/001

Dear (teacher),

Your headteacher has given me permission to send this letter to you.

My name is Steph, I am a trainee educational psychologist working with Hertfordshire County Council and studying at University College London. As part of my training I will complete a piece of research to submit as part of my thesis and which I hope to publish for wider benefit. I am writing to ask you if you would like to participate in this research

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project.

I am interested in the impact of self-regulated learning techniques because the Education Endowment Foundation suggests that these techniques can help students make improvements of up to 7 months progress. I would like to find out what teachers think of using self-regulated learning techniques.

Previously to training as an educational psychologist I have been a secondary teacher for 16 years and I intend to bring ideas on how to create an environment that uses the principles of self-regulated learning and at the same time not increasing the burden on your daily teaching work load. You can then select and adapt ideas that fit your curriculum area. My intention is to give you information to support what you are already doing in class alongside time to discuss the ideas.

What is the project's purpose?

In the training sessions I would explain what self-regulated learning involves, the theory behind the strategies for learning and how that might look in your classroom and we would plan how it could be incorporated into your schemes of learning without changing order of delivery of the curriculum.

You would be able to ask any questions and receive answers at any point in the research. There is no hidden agenda nor is any area of the research withheld from you until the end of the process.

What will the project involve?

1st 90 min workshop on SRL

3rd one-hour focus group
feedback meeting.

2nd 90 min workshop on SRL This session may be audio
(in school or online) recorded.

Completing 2x
questionnaires

Completing 2x
questionnaires

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How will I be supported? What will happen if I decide to take part?

During the workshops we will discuss how it would work best and what you are already doing that supports the process and set up plans and goals of what to do over the following weeks. At the end of the eight weeks you will be invited to feedback on what you found helpful or unhelpful throughout the process and what your thoughts were on how it impacted the students. Next year you will be invited to hear about the research results from all the schools that take part in the project.

Do I have to take part?

No, you do not have to take part, participation is completely optional.

If you did decide to participate, you would retain the right to withdraw from the research process at any time throughout the eight weeks and for two weeks following the end of the data collection process. This research has been through an independent ethics application process at UCL before starting the project, all materials and information that you receive have been checked to meet ethical standards of research.

Will all information be kept confidential?

You will not be identifiable from the information that is stored for the purposes of this research. All information you share will be anonymised and stored securely. Feedback may be audio recorded and you will be made aware of this before recording commences on each separate occasion. The recording is to ensure that I capture accurately content from the session.

Transcription of the audio recording of the 3rd meeting will not contain any names and your participant comments will be numbered to ensure anonymity. Whilst it is hoped that the research findings will be published for wider benefit within professional educational journals, individual identifying information will not be part of the dissemination of the research.

What if I am unhappy about something that happens as part of the research?

If you are unhappy about any aspect of the research, then please speak contact me using the email address below. You may also contact my supervisor to voice any concerns. If you have a more significant complaint or feel that your concern has not been heard. If you still feel that your complaint has not been handled to your satisfaction then you can contact the Chair of the UCL Research Ethics Committee on ethics@ucl.ac.uk.

Next steps and Contact Information

If you are interested you can complete the consent form and include your work email address so that I can contact you and your school and setup dates for the workshops.

Please do email me at Stephanie.little20@ucl.ac.uk to discuss any of your questions including any dates that might have been agreed for training by your school.

Kind regards,

Stephanie Little (Stephanie.little20@ucl.ac.uk)

If you have any concerns at any point in the research that you do not want to raise with me you can also contact my Supervisor: Dr Jess Dewey, UCL (jessica.dewey@ucl.ac.uk)

Teacher support line is an organisation to support teachers in the UK and you can get in touch with them using the link below:

www.educationsupport.org.uk/get-help/help-for-you/helpine/

I understand that if I agree to participate this information will be sent to me by email and I can refer to it at any time. * *Required*

☐ yes

Data protection statement

This is information that explains how this project meets Data protection laws.

Please read and then click to show that you have read it: Data protection privacy notice. The data controller for this project will be University College London (UCL). The

UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted at data-protection@ucl.ac.uk. Your personal data will be processed for the purposes outlined in this notice. The legal basis that would be used to process your personal data will be performance of a task in the public interest.

Your personal data will be processed so long as it is required for the research project. I will pseudonymise the personal data you provide – this means I will not record

your name. If you are concerned about how your personal data is being processed, please contact UCL in the first instance at data-protection@ucl.ac.uk. If you remain

unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at:

<https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/> * Required

☒ Yes I have read the data protection information

Consent form

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

I confirm that I understand that by ticking/initialling each box below I am consenting to this element of the study. I understand that it will be assumed that unticked/initialled boxes means that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element that I may be deemed ineligible for the study.

I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction * Required

☒ yes but I have more questions before I complete the consent form

☐ yes

*I understand that I will be able to withdraw my data up to 2 weeks after I have completed the final questionnaire and will be given a reminder of this whilst completing the questionnaire. * Required

☒ yes

*I consent to participate in the study. I understand that my personal information (gender, ethnicity, number of years qualified to teach, subject specialism) will be used for the purposes explained to me. I understand that according to data protection legislation,

'performance of a task in the public interest' will be the lawful basis for processing my personal data and scientific and historical research or statistical purposes' will be lawful basis of processing special category personal data (ethnicity). * Required

☐ yes

I consent to the audio recording of the 2nd workshop when giving feedback and at the focus group meeting which is where I will have the opportunity to feedback anonymously on the process in a focus group involving other teachers and the researcher. * Required

☐ yes

Use of the information for this project only *I understand that all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified. I understand that my data gathered in this study will be stored as a code (pseudonymously) and securely. It will not be possible to identify me in any publications. * Required

☐ Yes

*I understand that my information may be subject to review by responsible individuals from the University for monitoring and audit purposes. * Required

☐ yes

*I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, without my legal rights being affected. I understand that if I

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decide to withdraw, any personal data I have provided up to that point will be deleted unless I agree otherwise. **The deadline for withdrawing your data is the 31/07/22** * Required

☐ yes

I understand the potential risks of participating and the support that will be available to me should I become distressed during the course of the research. * Required

☐ yes

I understand the direct and indirect benefits of participating. Benefits may include accessing useful resources, continuing professional development around study skills and learning techniques and contributing to the whole societies' knowledge about learning. * Required

☐ yes

I understand that the data will not be made available to any commercial organisations but is solely the responsibility of the researcher(s) undertaking this study. * Required

☐ yes

I understand that I will not benefit financially from this study or from any possible outcome it may result in in the future. * Required

☐ Yes

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I understand that the information I have submitted will be published as a report and I wish to receive a copy of it. Yes/No * Required

- ☐ yes
☐ No

I hereby confirm that I understand the inclusion criteria as detailed in the Information Sheet and explained to me by the researcher. * Required

- ☐ yes

I am aware of who I should contact if I wish to lodge a complaint. * Required

- ☐ Yes

I voluntarily agree to take part in this study. * Required

- ☐ Yes

Use of information for this project and beyond I understand that my individual data will not be used in any identifiable format and that any use of the data in publication will be as part of analysis of the wider research project. * Required

- ☐ Yes

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Your contact details

Please enter your name below

Please enter a work email address below

If you have a question that you want answering please include it below and I will get back in touch with you to arrange a time to talk or answer your question by email.

Please enter your subject specialism(s). * Required

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What year groups do you teach in? * Required

- ☐ I teach in all year groups
☐ Other

If you selected Other, please specify:

What year groups do you intend to focus on when evaluating how useful the SRL techniques are? (you can say all groups that you teach if appropriate). * Required

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Final page

Thank your for taking the time to read about my research. I hope that if you have decided to take part you find it a really interesting experience.

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Appendix U

UCL ethics approval PDF

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document

UCL RESEARCH ETHICS COMMITTEE
OFFICE FOR THE VICE PROVOST RESEARCH



3rd December 2021

Dr Jessica Dewey
Division of Psychology and Language Sciences
UCL

Cc: Stephanie Little

Dear Dr Dewey

Notification of Ethics Approval with Provisos

Project ID/Title: 21265/001: How effective are lessons that focus on self-regulated learning at enhancing academic outcomes for secondary students' and teacher self-efficacy and wellbeing?

Further to your satisfactory responses to the Committee's comments, I am pleased to confirm in my capacity as Chair of the UCL Research Ethics Committee (REC) that your study has been ethically approved by the UCL REC until **31st July 2023**.

Ethical approval is subject to the following conditions:

Notification of Amendments to the Research

You must seek Chair's approval for proposed amendments (to include extensions to the duration of the project) to the research for which this approval has been given. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing an 'Amendment Approval Request Form' <http://ethics.grad.ucl.ac.uk/responsibilities.php>

Adverse Event Reporting – Serious and Non-Serious

It is your responsibility to report to the Committee any unanticipated problems or adverse events involving risks to participants or others. The Ethics Committee should be notified of all serious adverse events via the Ethics Committee Administrator (ethics@ucl.ac.uk) immediately the incident occurs. Where the adverse incident is unexpected and serious, the Joint Chairs will decide whether the study should be terminated pending the opinion of an independent expert. For non-serious adverse events the Joint Chairs of the Ethics Committee should again be notified via the Ethics Committee Administrator within ten days of the incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol.

The Joint Chairs will confirm that the incident is non-serious and report to the Committee at the next meeting. The final view of the Committee will be communicated to you.

Office of the Vice Provost Research, 2 Tavilton Street
University College London
Tel: +44 (0)20 7679 8717
Email: ethics@ucl.ac.uk
<http://ethics.grad.ucl.ac.uk/>

Appendix V

Self-regulated learning: follow-up resources

The self-regulated strategy development framework (SRSD).

For writing development: POW-TREE

6 stages of instruction for teachers to follow (details on p2 and 3).

1. Develop background knowledge
2. Discuss the strategy
3. Model the strategy
4. Memorise the strategy
5. Support it
6. Independent performance

POW-TREE to support students to formulate responses

General strategies

POW

- Pick an idea
- Organise notes
- Write and say more:
(WWW – what/how/who)

Genre specific strategies

TREE

- Topic
- Sentence
- Reasons
- Explanation
- Ending

You can adapt the ideas using the SRSD stages and make it work for your subject area: POW-TREE is just one example of a mnemonic for use in class that supports students to frame their answers.

Research has found this technique has improved text generation, self-regulation and improved quality of writing (findings also from LD populations)

Stages of SRSD Instruction*

Stage 1: Develop Background Knowledge

- Develop background knowledge and skills needed to learn the strategies.
- Read examples of the genre, discussing genre-specific vocabulary, genre elements, and choices made by the authors.
- Introduce writing and self-regulation strategies to be learned.

Stage 2: Discuss It

- Discuss students' attitudes towards writing and their current writing (and self-regulation) abilities as well as the benefits of learning the strategies and the importance of effort, perseverance, and positive attributions.
- Discuss contexts in which students can use the strategies.
- Introduce graphic organizer and mnemonic chart for the strategies.
- Practice taking notes on the graphic organizer and analysing both good and poor models of writing in the genre.
- Graph number of genre elements from a pre-assessment of students' writing (optional if teachers believe this may cause problems for their students).

Stage 3: Model It

- Collaboratively (teacher and students) use the writing strategies to compose a text.
- Collaboratively graph number of elements included in the composition and identify other aspects of strong writing.
- Teacher uses think-aloud procedures, verbalizing self-instructions and self-regulation during the composing process, and students identify self-statements the teacher used.
- Students write their own self-statements (i.e., things to say to themselves to get started with a writing task, motivate themselves, evaluate their writing, and reinforce themselves when finished).
- Discuss opportunities and other situations in which students can use the strategies.

Stage 4: Memorize It

- Discuss the importance of memorizing each step of the strategies and what each step means.
- Practice memorization of strategies with cue cards, games, and quizzes.*
- Memorization of the strategies and mnemonics begins in earlier SRSD stages and is ongoing until students fully commit strategies to memory.

Stage 5: Support It

- Gradually fade supports for writing and self-regulation strategies.

- Encourage students to create mnemonic and graphic organizer on their own paper (e.g., at the top or on the back of a writing assignment, on scratch paper) for making notes.
- Continue collaborative writing (teacher and students) as needed.
- Encourage collaborative writing with peers and writing independently(if appropriate).Continue supporting maintenance and generalization of the strategies.

Stage 6: Independent Performance

- Students successfully use the writing and self-regulation strategies independently.
- Teacher provides booster, or review, sessions if needed.
- Continued discussion of maintenance and generalization of strategies.

*From: Rouse & Kihara (2017). SRSD in Writing and Professional Development for Teachers: Practice and Promise for Elementary and Middle School Students with Learning Disabilities. Learning Disabilities Research and practice, 32 (3), 180-188. <https://doi.org/10.1111/ldrp.12140>

Activities for exploring memory in the classroom

Memory game with ‘tray’ of objects (can be done with picture on your white board).

Give out notes to the class to put them in either

- Group A – learn the objects
- Group B – think about the groups the objects fit into
- Group C – make items into a story sequence
- Group D – Method of Loci - Imagine you are in your own home and mentally walk through your home putting an item or two in a place in each room in your house

Group A should find it hardest.
Group B and C have method most suited to studying for GCSEs
Check if any in group A with high scores actually did use a plan.

- Have more than 15 objects on tray to challenge working memory (Miller – Capacity of STM is 5-9 average items)
- Have some of the items in the same category as each other (animals, food, furniture) this provides opportunities for chunking which should increase capacity.
- Grouping into a story adds meaning (semantics) to random items and mirrors what our brain does with new information – tries to make sense of it.
- Method of loci is a mnemonic that is used to learn lists – you could discuss the limitation of that method for studying for GCSE’s – you’d end up with lots of objects in your house! But it is useful for one off memory events.

Capacity: Digit span task

- Use a series of increasing strings of digits.
 - Say them to your partner
 - Your partner repeats back immediately.
 - When you get to a line where they make an error, the line before if their capacity.
- (if they make an error on line 9 their capacity would be 8)

Digit-Span Test

1. 5 9 0
2. 4 8 6 1
3. 7 3 0 9 4
4. 2 4 9 6 5 8
5. 1 4 6 8 2 4 5
6. 3 9 2 1 5 7 6 0
7. 6 2 5 7 3 9 1 8 4
8. 0 6 3 8 9 4 1 7 2 5

This is an example layout, you might want a longer set to challenge as some will be able to do up to 12 digits.

11

CLOSE X

Importance of knowing/understanding context

- Get students to write an account of a daily/common event.
- Ask them to take out key words associated directly with the event.
- They can join up with another pair and see if they can identify each others event from the verbal description with no key words.
- This will show how important prior learning and context are to make sense of new incoming information (schema theory).

Examples you could use:

Putting up a tent

Washing clothes

Going to the cinema

All described with out key words.

Appendix W

Researcher reflexivity during research design: Research Questions and how they were Addressed.

Planned action	Purpose of action	Notes on actual action taken
Recruitment of secondary schools from local placement authority to receive two workshops on self-regulated learning techniques. Headteacher information and consent forms (Appendix B) sent to Special Educational Needs Co-ordinator to obtain consent to recruit teachers (Appendix C).	To gain teacher perspectives on the use of self-regulated learning techniques in their busy secondary teaching context with heavily content laden curriculums.	After the first school to sign up was identified as having a low pupil premium cohort and predominantly white student population the second school recruited was sought out from a different socio-economic and cultural population, this meant recruiting beyond the placement local authority to a different borough, local to the researcher. A third non-mainstream school was then approached (known to the researcher's supervisor to have CPD time available), to directly address the issue that teachers in mainstream schools may have different perspectives from those teaching students from more vulnerable populations in alternative provisions.
Workshop one and pre-questionnaires: 90-minute workshop in week one (Appendix A).	To deliver content on cognition and metacognition and plan teachers target setting for classroom use of both techniques. To deliver content on motivation and review teachers	School one = workshop 1 delivered as planned for 90 minutes to 7 teacher who had signed up to the sessions. Workshop 2 cancelled at short notice for week 3 and rebooked for week 6. One member of staff available to attend on day, workshop delivered remotely and recorded with feedback and review.

Planned action	Purpose of action	Notes on actual action taken
Workshop two: 90-minute workshop in week three or four	use of workshop 1 information.	School two = workshop 1 delivered in 1 hour during pastoral directed time to a group of KS3 form tutors, workshop 2 delivered in 1 hour 4 weeks later. Focus group meeting in week 8 with 5 members of staff. School three = workshop 1 and 2 content delivered over 90 minutes to whole staff as initially only one time slot was given to the researcher. Workshop 2: Interest in the content led to a further session for review and reflection on practice being booked in, week 7. This session was audio recorded and used as the focus group feedback. Fidelity checklists were handed out in person at the second meeting.
Teachers asked to complete pre and post measures of their self-efficacy and attitudes towards self-regulated learning. At or before first workshop and two weeks or more post-workshop two.	To use quantitative data to assess attitudinal change in teacher perspectives that teachers may have not been aware of.	Not all teachers that attended the workshops completed the questionnaires.

Researcher reflexivity: method development.

The challenge of recruiting groups of teachers within school settings was harder than expected, which led to a change in criteria from recruiting only non-core subject teachers (as previous research had focused on core subjects) to recruiting from all key stage four subject specialists. The difficulty in recruiting staff may be due to the time needed to attend two workshops and as such I adapted when offered only one hour (school two) and only one slot initially (school three) to respond to that challenge. Prior research (Hattie et al., 1996; Muijs & Bokhove, 2020) suggested effective interventions with teachers take place over time, rather than in one off sessions. I became aware that I needed to deliver the workshops in a flexible format to enable teachers and settings to identify appropriate time slots, however, there was a limit to how far teachers could be persuaded to give their time when they were busy. For example, after only one teacher attended the workshop 2 in School one, I recorded the workshop 2 presentation and emailed it to the remaining 5 teachers and, using read receipt, found that no teachers watched the recording or then went back to complete the second set of questionnaires to complete the intervention process. It is worth acknowledging that for School one despite the enthusiasm that was shown in workshop 1 by the eight teachers who attended, two teachers did not complete the consent online form or the initial two questionnaires prior to the workshop, and seven of them chose not to return to receive information on 'motivation', which may reflect thoughts about the workshop content or the delivery that has not been captured in the evaluation process, though it may also just be demonstrating the demands that teachers have placed on their time. This is certainly a point I reflected on when recruitment through directed time (school two and school three) was more effective, though a less desirable option to me; at the start of the research process I wanted to avoid what I perceived as staff being coerced into training, However a different perspective is that directed time provided space to commit to training in the working day that was not available voluntarily in such a busy system.

Researcher reflexivity on the engagement at workshops.

School one, workshop one; Evidence of engagement.

During workshop one all eight teachers were engaged with the workshop content and gave examples of what they would be focusing on for their subject area, asking questions to clarify how they could address a specific concern that they held using principles of cognition and metacognition described. An example of discussion that suggested engagement with the workshop materials is from a modern foreign language's teacher asking how to develop students use of the vocabulary booklet that currently existed and was not being used by students proactively in class. Applying the metacognitive elements of the workshop suggested that students needed to have the use of vocabulary books modelled to them before they would

start to make use of them independently. It was agreed that action could be put in place to develop a lesson where the use of the booklets could be modelled and used to scaffold a written or verbal task. A group discussion on the use of scaffolded resources in assessments highlighted that often those with additional support in lessons were left without support at end of topic tests and written assessments that may lead to an impact on their self-efficacy. One teacher agreed that using supporting resources during assessments would not impact his ability to assess students effectively but could increase the student's ability to engage with an assessment task. When given time to discuss and select an area of their course to focus on all teachers came up with a challenge that they perceived in their classroom practice that they felt could be addressed by trying out a particular strategy or applying the cognition and metacognition strategies we had discussed. Teachers were encouraged to create a realistic target and select a focus class to work with on the area identified and bring reflections on this process back to the following session, a format was provided to guide this process with the intention of it being reviewed at the start of workshop 2. It was a surprise to the researcher that teachers were not engaged enough in the review process to return to one of the dates offered for workshop 2 or to complete the follow up surveys, engagement in workshop 1 had been positive. Recording of this initial session would have added to the richness of the data collected from this setting.

Further notes on school one.

Researcher reflexivity following qualitative analysis of school one data.

Three themes were identified from the data having allocated all the coded elements of the discussion into six sub-themes. The researcher kept in mind representing the views of the teacher through the discussion and all content that represented their views was coded. As the researcher had been teaching key stage four and five students prior to training as an educational psychologist the interpretations and perspectives brought to this analysis will inevitably be influenced by their own views and these have been acknowledged where they were consciously forming part of the analysis. It was clear from the transcript that the researcher was actively reframing challenges and linking to back to theory where possible. For example, when the Teacher Participant articulated how supportive guiding scripts were to developing confidence with tackling sensitive issues, this was linked to the need for scaffolding when we are at an early stage of a new skill. Another example was

“Yeah, but you're investing in relationships is really what you're describing, aren't you? ... once your relationships are in place, then they can trust you. Like you said, to know that when they do make, when you suggest to the class, it's based on kindness and good feelings. It's not based on control and coercion. Yeah.”,

Which demonstrates that the researcher was an active participant in the conversation and did not take the position of objective researcher.

The first familiarisation of the data was done through transcription and then through initial coding trials which led to, what the researcher reflected were, superficial codes being identified. Allocation of themes from these codes was recognised as generically consistent with the process of evaluating and implementing training rather than being interpretive of the teachers' perspective.

A month gap between this initial work facilitated reflection on the coding process used and led to a second period of coding using pen and paper. Once coded the research questions were reviewed to check that the coding addressed how much and which parts of SRL are being used (RQ3a) and how has SRL techniques been incorporated (RQ3b) and it was felt these issues did arise from the transcript and through the themes the researcher allocated to clusters of codes. Seven themes were assigned, however, 'challenges that impact learning, dilemmas in role and personal values were collated into one theme. In brackets the part of SRL that sits with the 'Aligning classroom practice to SRL' codes are given to ensure that they can be linked to one of the underpinning themes of cognition, metacognition or motivation that were put forward in the workshops.

Researcher reflexivity at the end of the research process during write up

(Autumn term 2023).

In the context of the school system a quantitative research design (my initial proposal) felt restrictive. Whilst discussing with school SENCOs regarding recruitment I was met with an encouraging amount of interest but often followed by questions that would require the programme to be adapted (e.g. can it be for our science teachers? Can it include key stage 4 staff, can we do the training but not complete any scales?). I recognised I was interested to know more about what teachers thought of the use of SRL and qualitative and case study approaches allowed me to explore what may have been lost using a quantitative approach. There is a wealth of evidence on effectiveness of the strategies, there is a wealth of evidence on how to deliver CPD effectively, why are there still gaps in the use of SRL in classrooms became a more interesting question to ask.

Whilst my initial interest as an ex-secondary school psychology teacher was what impact self-regulated learning strategies had on learners' academic outcomes a shift occurred, as the process continued, into developing my own competence at bringing the underpinning theoretical components to teachers to consider within the context of their specialist subject. I realised that my own use of 'cognition' in the secondary classroom was due to the A Level and GCSE Psychology curriculum content

(Miller, 1956; digit span research, memory models more broadly, Dweck's mindset research) that I had applied to learning to support student revision. As most research focused on core subject examples (Radford et al., 2014) other non-core specialists would be faced with application of SRL into their practice without supporting resources. I was interested to see if teachers found SRL useful across a range of subject areas and what barriers would be experienced when the theory was not part of the course learning (how do teachers prioritise skills teaching when content teaching looms large). Further reflections on the impact of my own views throughout the research project is included (Appendix B, X and EE) as it is acknowledged that my views have legitimately (Braun & Clarke, 2017) impacted decisions made and interpretations of the data.

Discussion during thesis editing process spring term 2023.

With another TEP (January 2023).

Asking if SRL is a directive and teacher-led initiative that again works against student autonomy and choice in how we learn. Identified their view of instructional psychology as a method imposed by teachers. Noticed how I responded to that in quite a defensive way, I had an emotional response: I felt cross. I had to ask more questions to shift out of that state of unease (am I researching something that is negative for students) and I asked 'why do you feel that way?' to avoid saying that I disagreed. This led to a discussion, though which the TEP agreed that it was not a directive method and I agreed that it seemed at times to be applied in that way. After the discussion it highlighted the importance of that 'knowledge broker' role to ensure that processes and theoretical underpinnings don't get skewed (reminding me of MacMahon 2022 paper where reference to knowledge-broker was introduced to me). Also, further confirms the need for CPD over more than one session to help bring to the fore and address misconceptions that might otherwise become embedded if teachers are left to reflect without a sounding board on theoretical applications.

Discussion with ex-teacher (March 2023).

When I outlined by research focus it reminded them of school where they were asked to make use of Bloom's taxonomy in all of their teaching process, which they described as like Maslow's hierarchy but for learning. They described the need to align all teaching activities and marking feedback with Blooms and found that when they left the school they still felt unsure about their own understanding of Blooms, which left them feeling uncomfortable even when writing the learning objective ('have I got it right? Have I linked it to the right thing?'). We discussed how an overuse or over-emphasis on one approach can be counterproductive and create misunderstanding, especially in this context where ironically her needs were not being met whilst worrying about 'getting it wrong'. Not a good environment fo

children to learn within if the adults are worried about getting caught out. I was reflecting on teaching as a profession where managers can impose their own views on professional practice that their workforce who then have to meet these invisible goals or be pointed out as not a 'good' teacher. Reflecting on how that I was how I felt in the role and was confused to get year after year of good or excellent exam results and still have people questioning my approach to teaching content.

Appendix X

Trustworthiness within the research process (Shenton, 2004).

Credibility	To address issues around credibility, questionnaires had been used in research with school teachers previously rather than a researcher developed version. Data collection (focus groups and interviews) were not held on first meeting with participants to allow teachers to have fully informed consent of what they shared with the researcher and potentially be more comfortable sharing – information sharing was not a compulsory part of the process. A wide range of subject specialists across three different schools and two different local authorities were participants which has encourage a wider perspective than if one school or one local authority had been included. Data triangulation was promoted by the use of attitudes to self-regulated learning and sense of self-efficacy questionnaires to enhance teachers verbal feedback on how confident they would be to use the materials. Triangulation was also achieved by comparing across the three schools to identify commonalities in responses.

	Where questionnaire data from one respondent was observed to be all identical across every scale it was removed from the analysis. Peer scrutiny of the research project took place in formal (tutorial) sessions and informally. Reflective commentary is included where appropriate in the body of the work and in Appendices. As the researcher had previously been a secondary school teacher for 18 years it was felt they had the credibility to run this workshop and use practice-based examples to highlight points being made. Whilst member checking as such was not considered appropriate for reflexive thematic analysis, thoughts and comments were clarified in the sessions with the participants where there was perceived to be any change of misunderstanding a point being made.
Transferability	Views expressed by participants will hold helpful information to other secondary teachers in the UK across a range of settings as more than one setting was included in the research. The method includes detailed information to help inform whether teachers or researchers feel able to draw from the work conclusions or information that is relevant to their own practice.
Dependability	Detail is given to provide a future researcher to repeat the process. It is acknowledged as the data was collected post-Covid in the summer term of 2022 that differences in teachers' views may be expected over time.

Confirmability	Reliefs, opinions and reflections during the research process have been included in the write up process. It is acknowledged that the process of conducting a reflexive thematic analysis with the qualitative data by nature is a subjective process.
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Appendix Y Reflexive Thematic Analysis: example of coding process from transcript and initial theme development

Example of coding process with transcript from school one.

RESEARCHER Yeah.	
TEACHER PARTICIPANT Is, I think when you do say this is the theory of doing a mind map, it's not exactly the most exciting sort of idea is it? especially when you're sitting there and you're in year ten and you.	Stephanie Little Expecting students to find it boring
RESEARCHER Yeah.	
TEACHER PARTICIPANT But you can't think of anything worse than having to go and revise and then being told not just you have to revise, but why certain things work. So I think it is. It's not necessarily that it's not a successful thing, but I think I've just tried to explain to them that it it's not everything is exciting.	Stephanie Little Expecting students to find it boring Stephanie Little Barrier that study skills are a boring part of course deliver
RESEARCHER Yes.	
TEACHER PARTICIPANT And no, not, everything is gonna be a, you know, all the all the bells and whistles and all of that. But sometimes you do just have to crack on with with things that might be a little bit more.	Stephanie Little Dilemma of exciting versus boring narrative, thinking its helpful and rationalising why it's needed Stephanie Little Monotonous and boring have been used.
RESEARCHER Yeah.	
TEACHER PARTICIPANT Little bit more monotonous and and but I think again like I say in about that working on it over the year, if it's something they get used to. That is, I think having it all in one chunk is would be less beneficial than spreading it out and do a little bit.	Stephanie Little Thinking that spreading it out will help tackle issue of monotony
RESEARCHER Yeah. No, I completely agree. Yeah.	
TEACHER PARTICIPANT No Often. So I think if it was, yeah, if it if it was. Yeah. Not necessarily that it's not successful that, but it's it's definitely a a bit of a hurdle to to sort of get over. If you're doing it is all in one go.	Stephanie Little Suggesting that delivering study skills in one go is not a good idea.
RESEARCHER Yeah. And I'm thinking about the fact that I had a bit of an advantage when I was	

Example of coding process with transcript from school two.

actually talking, everyone was getting on with the work, no one was, you know, distracting anyone else, he was like OK I have to do this so he took initiative of his own learning and I think it benefitted him really well

Researcher

Hmm.

Computer 1 – person 2

In my opinion.

Researcher

Yeah. And it's that having to be really brave then isn't it? And giving it a go, yeah.

Computer 1

Yeah, because once they saw that he did the work, because once he started, I was, like, praising him. I thought, "well done, you doing great?" Like you've started it and then you carried on. It was like, "hey, you finished the first half. That's even better. Come on, let's move on the second task." And then by the end of the lesson, he had, like, a big smile on his face. And he was like, "I can do this." And he wasn't disruptive. He actually did all the work. So, I think, yeah, for him and really benefited him.

Researcher

Yeah. Do you think that sometimes we might be accidentally underestimating what they might be able to do? Because...

Computer 1 – person 2

Yeah, we especially when they have like an LSA or TA next to them which they get like a lot of the support from. And, and they, they basically been treated as like a little child, especially when they're like, like year 7, 8, 9, I think we, yeah, we underestimate how much they can actually do on their own how like, well, they do independently we think, you know, they need a lot of support and actually in reality do they or is that what we're giving them? But yeah.

Computer 1 – person 1

I feel like I've noticed that within uh, languages as well, a lot recently, with languages, a lot of the kids tend to just give up when they see a word they think they don't recognize. But then we have to kind of remind them, look, we've, we've learned this before, we just need to retrieve it and you know it is up there somewhere. It might have been what we've learned in year seven or year eight, but they sometimes forget when they see a word they recognize, they just ask us or straight away and I'll try and encourage them to use a dictionary or something whenever they can or look back through their books to find that word first because I know that we have learned it. It's just sometimes they do, just like you said. We and I I'm guilty of it as well.

Stephanie Little

When the instructions are clear and everyone else is getting on then he took the initiative.

Stephanie Little

Snow balling impact of having a go linked to increased praise, etc ,etc

Stephanie Little

Feeling that a TA or LSA presence may have masked some of their opportunities to improve

Stephanie Little

Problem encountered in languages about giving up quickly

Stephanie Little

Information that has been taught in class then gets forgotten.

Stephanie Little

Teacher colludes with problem when you answer their question straight away.

Example of coding process with transcript from school three.

P6: A lot of them have a bank of words and stuff	
P7 yeah, probably up until their mock exams moves on to the motivation where they're ac because the writing frames have been repeti they do the mocks and feel at ease, and som don't want to use those writing frames now, I and some of them might say actually, can yo the top of your head rather than seeing it in f going and gradually I kind of find they don't n be very, very repetitive, beginning in Septem confidence and such low self-esteem. So yea through the course of the year. Providing tha mentioned at the beginning and then kind of gradually easing off with it and that's where they kind of take responsibility of their own learning as well because they know that they've got to start working independently at some point.	Stephanie Little, 23/10/2022 15:04:00 commented: They eventually take responsibility for their learning after having a lot of support. My thoughts - do some teachers worry that this won't happen in mainstream - do we conflate support with dependence. scaffolding to lead to greater nce seem to develop through s them to increased self-esteem as
R: yeah. Does anybody explain when you are using starters and repetition of content does anyone explain to the class why you are doing that?	Stephanie Little They eventually take responsibility for their learning after having a lot of support. My thoughts – do some teachers worry that this won't happen in mainstream – do we conflate support with dependence.
Two people speak at same time: I explain all the time/ we do do that in English....	
P6: the reason why we are going over it is that you are more likely to remember each question out in the way that the examiner wants it.	Stephanie Little Using repetition to meet the needs of the examiner not the learner
P7: Yeah thinking about it, I suppose naturally you use that same script every lesson to teach it constantly reminding them the reason why we are doing this is because, we probably do that without really thinking about it.	Stephanie Little Using repetition to help them pass the course My thoughts – underpinning this are skills that benefit the learner but are they being identified as being beneficial beyond the exam?
Lots of agreement noises	
P4: especially because the students question repetition. (R: yes, that was what I was wondering), they think they don't like it. They say "well why are you doing this again?". If you explain it they are a little bit more accepting.	Stephanie Little Agency – recognising that student understanding of the process leads to greater collaboration.
R: (two or three people have joined late so I return to a broader question in case there is more contributions). Yes, that's interesting, anyone else got anymore reflections (welcomed someone new into the room as an aside)?	Stephanie Little Reflecting on the importance of failure on later progress
P8: A lot of growth mindset – not sure if you mentioned that before I came- I think that is the key for me. A lot of the young people that we work with in this type of environment, no one has ever explained to them that failure is actually really important. And it's about repetition, about mastering something and about the hours needed to get better. I think that as soon as they understand and actually appreciate that it might not be a strength of theirs, it's OK. And actually, the more	Stephanie Little The idea of practice being part of the progress
	Stephanie Little October 23, 2022 Wanting students to re-imagine failure and be prepared to experience setbacks

Initial codes identified during familiarisation process using NVivo.

School one	School two	School three
Benefit from workshop for students Challenge and barriers Developing self-efficacy	Identifying SRL in teacher comments Challenges and barriers Impact on practice Impact on students Impact on those with additional needs	Links between workshop content and setting Learning barriers that exist Reflections on impact on own learning Reflections on new actions Student voice Values setting are trying to embed What currently works

Appendix Z: Reflexive thematic analysis: Theme development from coding.

Main analysis: Workshop review session/focus group (post content delivery).

School three example: Three phases of analysis were undertaken until the final five themes were decided upon.

NIVO August	Learning barriers that exist	Links between SRL and this setting.	Reflecting on impact of SRL on learning	Reflecting on importance of new actions taken	What currently works	Student voice	Values they are trying to embed
Pen, paper, post-its October	Fear of failure – students and teachers feeling damaged by the system (A)	SRL is part of my teaching : now and future (B)	Frustrated with testing culture (C)	We can model the change. (D)	Noticing independence and promoting self-esteem. (E)		Take away points that they intend to make use of (F)
Pen, paper, post-its October	Damaged by the system: Fear of failure (A)	SRL is part of my teaching now (B) and future plans (F). Merged two themes on review.	Frustrated with the testing culture (C)	Teachers as the change (D)	Increased independence (E) (linked to multiple references but one person's accounts)		

School three example: Themes in final October analysis mapped against coding and examples from the transcript.

Themes	Coding	Examples from transcripts
Damaged by the system: Fear of failure (A)	Importance of normalising mistakes as part of process. Previous negative experiences of education have made students anxious about making mistakes. Students have lost confidence in education. Finding it hard to trust adults and preferring peers. Wanting to normalise mistakes for learning process. Recognising the need to protect student's ego's. Pressure of negative consequences if the work isn't at the right level.	"a lot of these kids whether it is at home or in school have a pretty impoverished in education where they have been made to feel bad about doing something badly rather than use it as an opportunity for growth" person 1. "they've lost their confidence in education, haven't they? By the time they come to us." Person 2 "because all of them have been the one to be removed and that's where that barrier has come from" person 11. "we want them to normalise making mistakes" person 1 "yeah it's too threatening" (about seeing lots of information). Person 2 "[...]obviously we explain every page to them [...]it's not threatening at all because it's like, 'oh this is actually quite easy' person 2 "[...]once we've developed more of a tougher attitude then we will put more complicated things in..." person 3

	Treating earlier wins as a basis to build challenge. Recognising the adult's role in their fixed mindset.	
SRL is part of my teaching now (B) and future plans (F)	Recognising Cognition part of workshops is being used already in classes (maths) Repetition used to support learning Recognising that project work meets the needs of the learner Focus on repetition for long term retention Errorless learning approach Using early success to build resilience Guaranteed wins built into lessons (Cognition) Recognising agency in their non-curriculum course.	"But talking about the cognition side of things, we do this quite a lot, because in maths we do a lot of retention tasks, or using the starters as an opportunity to revisit previous lessons learning to see how much has stuck." Person 1 "we also do the same with plenaries, not only at the end of the lesson to ensure that learning has occurred and maybe can we move on next lesson or do we need to spend a bit more time going into more depth" person 1 "when you mentioned that successful learners put a lot of effort in, actually we talk about that a lot in terms of mastery..." person 1 "it's very active and they do small chunks of work [...]it's like really broken down" person 2 "we try to start every lesson with something that everyone can do" "that is quite a nice feeling, ' I know I'm going to have some success'" person 3 "I have to break everything down into bitesize chunks [...] if I present it in font size 14 and give them a couple of questions or just a cloze passage they will access it and will quite happily work

	Describing cognition theory – bitesize chunks. Adapted tasks are promoting independence. Great collaboration comes from student understanding of the process (agency) Practice is part of progress. Time to think has shifted ideas about how to use language differently. Getting out of old habits.	independently most of the time” person 7 “letting go of that control, if it works and if it doesn’t you can do it again and it’s not a problem. It’s that element of control” person 12 Future intentions “...the graphic organiser, I’ve got certain students that I thought would be really beneficial for...” person 4 “When you go through teacher training you are almost taught to hide it [sighs] (cognition and metacognitive strategies) [...] you are taught to hide skills in activities....I don’t know about other people, but being explicit about what I am trying to do[...]naming the skills, I think this could be really useful for them. But it’s not necessarily how we were taught to teach” person 12.
Frustrated with the testing culture (C)	Using repetition to meet the needs set by the examiner and not the learner. Using repetition to help them pass the course. Aspirations for an education system that	“sometimes it feels like teach to pass a test rather than teach for maths that they’re gonna use for the rest of their lives” person 1 “how can it be made more real for us? [...] show me why I need to know it” person 8 feedback from pupils who have left.

	is about pupil's future life.	
Teachers as the change (D)	Promoting the re-imagining of failure and being prepared to experience setbacks. Desire for adults to model change by addressing their own areas for growth A desire for adults to change Adults need to feel uncomfortable at times in own learning to empathise with students. Expressing dissatisfaction with the current system. What we wear as teachers can be a barrier. Wanting adults to show more vulnerability Encouraging a questioning approach that's modelled by adults	"It's the most powerful thing I think we can do with our learners is to acknowledge that, you know, it's about growth, shift their mindset from I always fail to its ok to fail." Person 8 "Then I think our practice would be so much better , if we started thinking that way because that's something that we don't look at [...] but actually as development for staff was well, what can I change in my lesson to engage that kid..." person 9 "I think letting them see that you get things wrong. Letting them know that making a mistake is ok [...] the kids seeing you getting things wrong and you learning from it, I think that is really important." Person 10 When helping out in a different class "it was really nice to see how simple could build up and up and at the end I thought 'I can't believe I can do that'" person 4

Increased independence (E)Aligns with comments from school two all references to independence are from one teacher.	Scaffolding seen as increased independence. Early repetition leads to better self-esteem. Taking responsibility for their learning after lots of support Adapted tasks are promoting independence.	After using writing frames at the start “that gets them going and I kind of find they don’t need any support at all.” Person 7
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Appendix AA

Training evaluation form (School two)

Self-regulated learners' workshop(s) Evaluation form

What was your knowledge level about self-regulated learning before the workshop(s)?

1 2 3 4 5 6 7 8 9 10

How would you rate your knowledge about self-regulated learning now?

1 2 3 4 5 6 7 8 9 10

How far have the workshops given you ideas that you can use with your students?

1 2 3 4 5 6 7 8 9 10

Rate the workshop(s) for how clear the information was presented.

1 2 3 4 5 6 7 8 9 10

I liked	Even better if
The target I set myself after the (first) workshop was....	
Please feel free to add any other feedback comments on the back of this sheet	

Appendix BB Theme development for school three additional information
(workshop one).

**School three Additional information: allocation of codes into themes with
extracts for workshop one comments.**

Notes:

- Letter codes reflect the code short hand used by the researcher across the transcript when coding (pen and paper using post-its) and are not related across transcripts.
- Equally person 1 is not the same as person 1 across different transcripts – numbers are being used to illustrate range of people contributing.

School three- brief analysis of comments made during Workshop one content delivery (initially proposed as only session available) led to four themes being identified.

Learning needs to be relevant before students will engage (A)	SRL doesn't address the needs of our cohort (B)	Teachers focused on building resilience, self-esteem and trust.(C)	The system as the problem (D).
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Theme	Coding	Examples from transcript
Learning needs to be relevant before students will engage (A)	Motivation is a big challenge Learners feel the learning is not relevant to them.	"It's a far cry for some of our learners though, the motivation, they can't see what the relevance, often of what the learning is..." person 1

	Preference for courses with real-life application. Motivation is challenging when there is no career plan.	"I feel like real-life application is so important for engagement. That's why I quite like the functional skills..." person 2 "There's a lot of our students don't know what to do in life, they haven't got any sort of aspirations [...] they don't believe they can go anywhere" person 3
SRL doesn't address the needs of our cohort (B)	Young people not believing that they can do anything they want Cognition is least likely part of SRL they would explain. Metacognition is something to discuss between teachers and not students Lack of trust in adults is a barrier to making use of SRL Metacognition and cognition seen as equally difficult in this setting. Metacognition as a ridiculous idea to share with students. Resilience of learners considered a more important goal for teachers.(and by implication not seen as part of SRL). Referring to social needs and Maslow's hierarchy of needs as more appropriate focus than SRL.	"There's a lot of our students don't know what to do in life, they haven't got any sort of aspirations [...] they don't believe they can go anywhere" person 3 "It's often hard for us to get to the point of discussing cognition, we discuss it among ourselves, but certainly not with the students, it would be difficult for us to discuss it with the students" person 4 "There's issues with trust." Person 4 "Yes, metacognition (laughs) that would be another country...(others laugh)" person 4 "before we even get into the process of metacognition, it's the gap before it, it's the resilience..." Person 5 " and reengaging what's been lost before they've come here" person 5 " and we say, 'oh you'll get it' which leads people to a huge amount of

	Challenge is addressing emotional needs in just two years. Frustration about what has happened to students before they arrive at this setting. Recognising SRL is important to teaching but not for this cohort. Wanting recognition that not all will 'get there' Feeling the limitations of the growth mindset approach of using 'yet' with pupils with SEND. Systemic focus on testing doesn't suit this setting's cohort. Errorless learning perceived by adults as patronising to this cohort. SRL requires self-advocacy of students around 'what has helped' that is a barrier for some in this cohort.	disappointment, better to show people different ways..." person 5 "I've tried to do that in some lessons, but it's actually become very disengaging, a bit condescending almost, whilst a lot of our learners do have big gaps because of their time out of education, and that, we want those wins and we are sort of fixated on you know, however, sometimes it has that opposite effect." Person 8. "Yeah sometimes with our learners they find it hard to pin point what it is they don't like. [...] they don't understand how, or they will say, 'oh I don't like it', they won't be able to tell you what it is about the learning [...] but a lot of them won't be able to give you that feedback or why." Person 9.
Teachers focused on building resilience, self-esteem and trust.(C)	Building up confidence in students through experiencing success. Engagement is the first barrier that needs addressing. Language is important – practice makes progress.	"I'll take Maths and English as an example, so the process they have to allow students to feel success among the staff so that they can step up to English..." Person 5. "our main issue is an emotional issue rather than a process issue – how do we get students to engage with us?" person 4.

	Language is important – adult taking responsibility for teaching well Language is important – the power of yet Lifelong learning as an aspiration and modelled by some staff	“another one is ‘practice makes perfect’, there’s no such thing as perfect, if you do practice and you don’t reach perfect people feel bad about it” person 6 “I observed someone [...] and he used to say ‘if you haven’t been able to remember this, it’s because I haven’t taught it well enough’ which took the pressure off them...” person 8 “the fact that you haven’t mastered it ‘yet’, it’s a journey...” person 9
The system as the problem.	Systemic issues and an over focus on testing. Frustration of the mainstream system	“it’s the system it’s too focused on testing” (unidentified speaker “the reason we get a lot of children here, because schools are focused on children who can, at the expense of those that can’t [...] they become completely disempowered...” person 5

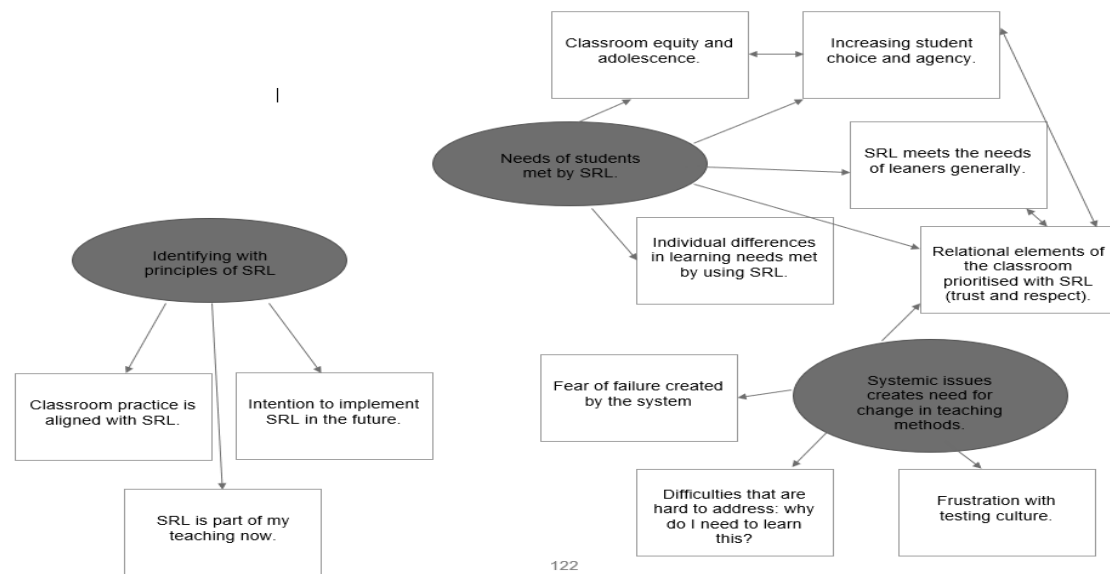
Appendix CC Additional participant notes from school three

School three participant submitted notes on techniques used since content delivery listed by components of self-regulated learning as unable to attend focus group.

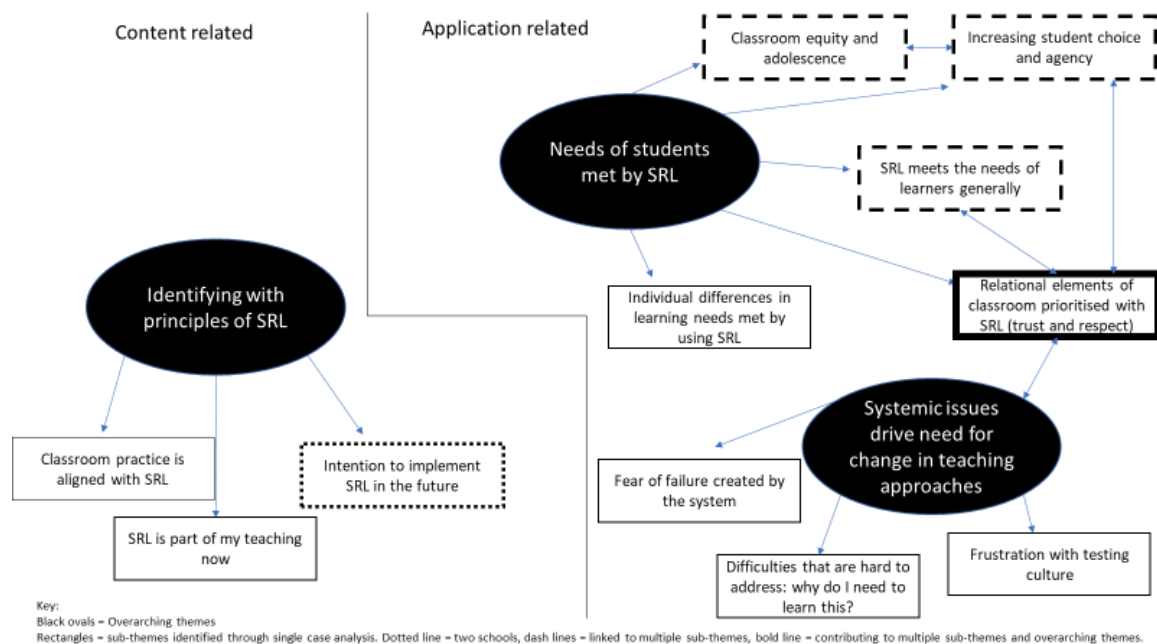
Component of SRL	Information given by teacher
Cognition	• Retention tasks • Plenaries (for short term recall) • Mastery process – ‘little and often’ • Normalising that mistakes are positive – it shows my areas to improve, ‘practice makes progress’.
Meta cognition	• Revisiting learning outcomes mid-lesson. • Reflecting on learning outcomes at the end. • Booklets • Kahoot quizzes tailor made, short assessments in form of a starter. • Learning mats, practice papers online -, small groups or on own. • Revision schedule
Motivation	No comments noted

Appendix DD:

Thematic map: cross case analysis development.



First map above contains all themes and subthemes with edited map below following discussion regarding relative strength of sub-themes and frequency in data. Dividing line was removed following discussion that the two parts of the diagram are not separate -relating to the content is likely to predict use of it.



Appendix EE: Strategies and classroom issues discussed with teachers.

Informal notes and reflections on areas discussed with teachers during the workshops. .

Setting	Overview of discussion with teacher participants.
School one 10.5.22	Strategies discussed: Longer answer question frameworks – use of them to support writing skills both as lesson practice but as option in early assessments – Fading: don't remove scaffolding until learners are confident in skills to build self-efficacy, remove support gradually over time when students are ready to take back control. Making it explicit to learners when you are using processes linked to repetition (cognition). Asking pupils what other subjects they are successful in/enjoy to try and find common ground and support them to be metacognitive in different subject areas (use what went elsewhere in your lesson). Curiosity: What has worked for you before when preparing for a test? Science – use of evaluation of test outcomes and retrieval practice embedded. Problems raised: 1. Languages teacher giving out a bank of words at start of course and finding students not using it/applying bank of words to work. Curiosity: is it being referred to in class, is it an

	overwhelming amount of information (cognitive load), is it clear 'how' they need to use it? Outcome decided on: to use the word banks to create graphic organisers at the start of each topic of words that will help in that unit of work. Build profile of the resource and teach how to best use it. 2. Poetry hard to teach and engage students. Some do not want to write and re-draft their work. Outcome: use of post-it notes to engage reluctant writers to 'move' ideas around on their page. Could see that graphic organisers might be helpful way of representing links in the poetry unit (creating schemas). 3. Longer writing tasks are hard for some students. Outcome: use of writing frames and sentence starters for those who might struggle to get started. Prompts of what to include at each stage.
School two	Strategies discussed: Problems raised: Focusing on top end students and so have less time to plan resources for those who study. Outcome planned: to set work for those who can work independently and provide scaffolding for those that cannot, free up time to work with those who then identify help needed. Poetry not enjoyed by all. Outcome: agreed to model process of analysis with class and provide a structure (scaffold) for them to use on a poem of their choice. Building skills in a context they prefer before moving on to the context they are less motivated in. will this build motivation and engagement?

School three	Both sessions were recorded and summary produced in results section. Strategies discussed: Breaking tasks down into tiny parts to encourage engagement and build self-efficacy. Modelling strategies (including self-regulation) Need to take a growth mindset approach – believe that we need failure to build success on -finding problems help us to learn. Word banks, sentence starters and scaffolded worksheets. Smaller amounts of information on each page of workbook supported students to focus on each task more effectively .
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