Thinking aloud: An exploration of the impact of developing teachers' metacognitive questioning skills on metacognitive regulation in the classroom

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ABSTRACT

This practitioner research project has explored the impact of developing teachers' metacognitive questioning skills on students' metacognitive regulation in the classroom. The research context is a Jesuit Catholic school which is also an IB World School, based in England. As such, the development of metacognitive questioning skills is set within the joint frameworks of the Ignatian Pedagogical Paradigm (IPP) and the International Baccalaureate's approaches to teaching and learning (ATLs).

The literature review examined the conceptual understanding of metacognition and its relationship to self-regulation. Furthermore, the body of literature indicated a synergy between the IB's ATLs, the Jesuit IPP and the accepted cyclical structure of metacognitive self-regulation. Finally, the literature review examined the impact of both explicit and implicit teaching of metacognition and metacognitive skills, whilst also acknowledging the central role of effective CPD in enabling such student development.

The research design involved an initial whole-staff CPD on metacognition and questioning techniques, following which teachers were invited to volunteer to trial these methodologies in their year 9 classes. Collaboration was at the heart of the research design, with a pre-existing teaching and learning group involved in selecting the initial focus, supporting the delivery of CPD, and then conducting peer observations of the teacher participants' classes. Qualitative data was collected, including teacher self-reflection journals after lessons, peer observations, and a post-intervention semi-structured group interview.

Thematic analysis was used to analyse the data, with preliminary findings suggesting that the application of metacognitive questioning was perceived, by the participating teachers, to have a positive effect on the degree of self-regulation observed in the students in their classes. However, significant caveats were placed on that positive response, with teachers noting that this was very much task specific, and that a more considered, long-term intervention would be required to draw a more robust conclusion as to any impact. Equally, an evaluation of the qualitative data gathered highlighted the limitations of eliciting findings based on observed or self-recorded teacher perceptions rather than quantified outcomes. Nevertheless, the findings also provided insight into the benefit of reflective practices by teachers and the contribution that taking part in such practitioner research can make to collective teacher efficacy. These findings have informed the next steps from this project, including the development of further whole school CPD, the intention of which is to continue to contribute to the school's stated whole school strategic aim of effective study skills development within a Jesuit framework.

Contents

1.0 Introduction

The primary aim of this practitioner research project is to investigate the development of teachers' skills in framing questions to support metacognitive self-reflection. Secondly, it aims to investigate how this skills development might impact students' metacognitive regulation in the classroom. A significant external driver for this strategic focus was the recent ISI inspection (ISI, 2023) which recommended that 'study skills' should be more consistently embedded across the school. However, this project is firmly rooted within my school's context, which is a Jesuit, Catholic co-educational day and boarding school in the north of England. The significance of this context is that, as a Jesuit school, teaching and learning is set within the framework of the Ignatian Pedagogical Paradigm (IPP) (Jesuit Institute, 2013). The IPP is intended to be a practical pedagogical approach, which emerged from the Characteristics of Jesuit Education document, a process of "reflection and discussion [regarding] questions of identity and mission in contemporary Jesuit schools" (Jesuit Institute, 2014, p.1). As such, the IPP emphasises the teacher role in the development of students' learning skills, in addition to factual recall, and a significant internal driver for my project is the stated aim within the school's strategic plan to "accompany teachers in their mission as Ignatian educators" (School A, 2022, p.4). I aim to contribute to this long-term strategic development focus by supporting teachers in the development of student skills for learning across all year groups at my school.

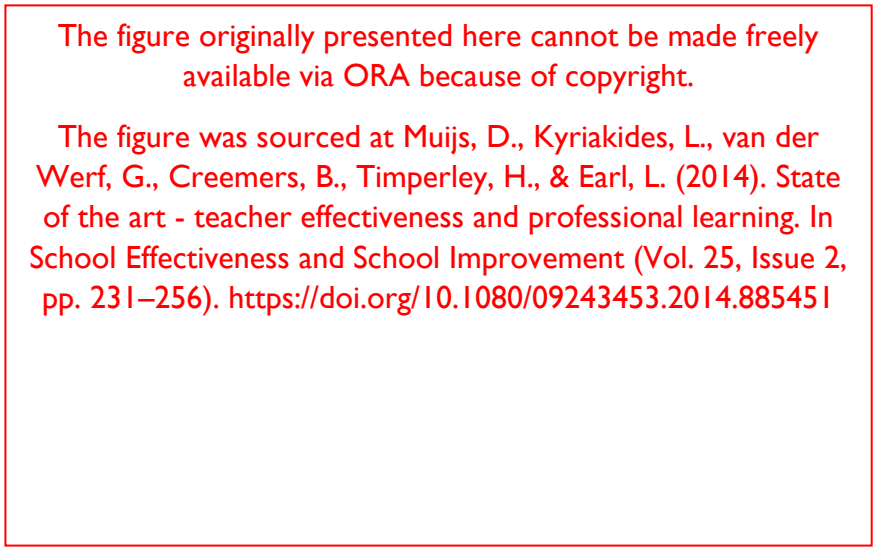
The context of my school also means that it is important to acknowledge the contribution of curriculum specific guidance, specifically the broadly constructivist approach advocated by the International Baccalaureate Organisation (IBO) in their document 'Approaches to teaching and learning in the Diploma Programme' (IBO,

2015). The International Baccalaureate Diploma (IBDP) is an established pathway for our sixth form students with around 40% each year opting for the IBDP. As an IB world school, there is an expectation that our pedagogical approach will contribute to the development of learner skills, as defined within the International Baccalaureate's Learner Profile (IBLP) (IBO, 2017).

Both the IPP and IBLP have enquiry and reflection at the heart of their pedagogical approach. To draw these strands into a coherent whole, the school's 5-year strategic development plan contains an objective to develop a more overtly Ignatian approach to pedagogy, combining the Ignatian Pedagogical Paradigm (IPP) with the International Baccalaureate' Learner Profile (IBLP) (School A, 2022, p.5). Having clarity of thought as well as a clear articulation of the potential synergies between the Ignatian approach and the IBO approach to pedagogy will present a potential challenge. Therefore an element of the literature review will be to explore what is written about the relationship between the IPP, the IBLP and the accepted conceptual understandings of metacognitive self-reflection and regulation.

As previously stated, the focus of my intervention will be on eliciting the impact of developing our teachers' skills in promoting metacognitive self-reflection in their classrooms. As such, the design of this intervention is multi-faceted. Initially, all teachers will take part in a continuing professional development (CPD) session focusing on metacognition as well as metacognitive questioning and modelling techniques. Teachers will then be asked whether they wish to volunteer to take part in a trial of these techniques with their year nine classes over half of the Easter term. The short time frame means that the likelihood of observing any credible quantifiable impact is slim. As noted by Mannion (2021) in his discussion of his eight-year longitudinal study of a 'learning to learn' complex intervention, quantifiable findings

were only analysed vs control groups after three and five years. My data reporting approach will therefore be solely qualitative, focusing on thematic analysis of the teachers' qualitative self-reflections, supplemented by peer observations as well as a semi-structured interview. My intervention follows a reflective cycle as it moves from the initial identification of metacognition as a focus, followed by the development of CPD for teachers to develop their metacognitive questioning skills, through to an intervention using those skills and a consequent reflection of the impact. As such this cyclical approach has been inspired by Muijs et al.'s (2014) work on teacher effectiveness and professional learning, through a teacher inquiry and knowledge building cycle as shown below:



(Muijs et al., 2014, p.247)

From a personal professional perspective, the previously stated strategic development objective falls within the remit of my role as Director of IB and IB Diploma coordinator at my school. The IBO emphasises the importance of the coordinator as pedagogical leader, participating actively in the development of effective learning and teaching which is consistent with the IB's mission and vision (IBO, 2021, p.7). The IBO (2015) discusses this pedagogical leadership role in terms of developing and implementing

such initiatives, whilst recognising the challenges of embedding initiatives by engaging teachers such that they become integral to the school culture rather than them being seen as "an add-on" (IBO, 2015, p.43).

Muijs and Bokhove's (2020) evidence review, on behalf of the Education Endowment Foundation (EEF), of the relationship between metacognition, self-regulation and attainment noted a 'quite strong' positive correlation, whilst also providing a high rating for the impact of interventions based on teaching metacognitive and self-regulatory strategies (Muijs & Bokhove, 2020, p.25). This is supported by the EEF's (2021) evidence summary of 246 studies, with median costs being judged to be "very low", whilst additional progress was judged to be, on average, seven months (EEF, 2021). This conclusion, in itself, might be considered an evidence based rationale for choosing metacognition as the focus for this project, as a clear, easily communicated rationale capable of generating sufficient enthusiasm and motivation for teachers to take part in the research. However, the imperative of my role as pedagogical leader and its associated challenges in ensuring that initiatives have the potential to be embedded as part of the school culture provides an additional motivation to develop a collaborative approach throughout the practitioner research.

Stoll and Kools (2017) also emphasise the role of learning leadership within school learning organisations, noting the importance of leaders in modelling and supporting individual, group and collective learning (Stoll & Kools, 2017, p.11). Therefore, prior to the commencement of the project, I had established, together with the Director of Teaching and Learning, a Teaching and Learning (T&L) group made up of a group of interested colleagues from all levels of the organisation. The establishment process is detailed further in the collaboration section, but the pre-existence of this group of colleagues meant that the initial collaboration framework had already formed.

Importantly, I was able to involve the T&L group in the prioritisation of potential project foci, in other words, our "shared challenge" (Greany & Maxwell, 2017, p.3) and the choice of metacognitive self-reflection and self-regulation emerged from the collaborative discussions of that group,

As a member of the Senior Leadership Team, I am also conscious of the potential ethical challenge of asking colleagues to engage in a collaborative research and development project when those colleagues may feel under pressure to comply or to respond in a particular way due to the differentials in position within the school hierarchy. Therefore, Hargreaves' (2019) discussion of making one's own learning visible, in terms of the positive impact on the establishment of trust in the intervention has particular resonance to me. I will be leading the learning of my colleagues whilst also learning myself through the process of completing my research. Furthering Hargreaves' argument, I felt it was important to establish in the early stages of this intervention, that I was not an 'expert' but a 'lead learner' (Hargreaves, 2019, p.15). The ethical challenges of my position are a factor influencing multiple facets of this project, in terms of recruitment of volunteers, collection of data and presentation of findings, and this important element is discussed, therefore, throughout the paper.

2.0 Collaboration

As stated in the introduction, prior to the commencement of my project, participants had been invited to join a Teaching & Learning (T&L) group, coordinated jointly by me and the Director of T&L. This invitation was issued during the September 2023 INSET as part of the launch of "The School A Learner"; a long-term strategy, which had been our first step in meeting the school's stated strategic development objective to accompany teachers as Ignatian educators. During the Autumn term, this group formed and met together to identify the key skills that the teachers felt students at my school would need to acquire to "develop full human potential" (School A, 2022, p.1). In the first meetings, the group identified five key strands:

- Being prepared
- Being inquisitive
- Being confident
- Being independent
- Being reflective

It was further agreed by the group that metacognitive skills development should be the first focus within the longer-term plan. The rationale for this choice was that this would facilitate the development of the other strands listed above and the group felt that this was at the core of the project. Thus, collaboration was central to the identification of the focus for my own practitioner research. A potential benefit of this early collaboration is that it may have contributed to the effective implementation of the project, as discussed by Greany and Maxwell (2017), who suggest that the identification of a "shared challenge" as well as "agreeing and evaluating an

intervention" (Greany & Maxwell, 2017, p.3) would benefit the efficacy of that intervention.

Furthermore, literature suggests that the effective implementation of strategic development will depend on establishing a collaborative organisational commitment to that change. Hargreaves (2019) refers to the benefits of collaborative professionalism, quoting the Organisation for Economic Cooperation and Development (OECD) conclusion that "a collaborative culture within the school shows one of the strongest associations with teachers' self-efficacy and job satisfaction" (OECD (2016) cited in (Hargreaves, 2019). Central to the concept of collaborative professionalism is the value attached to the experience and expertise of colleagues at all levels in the organisation. Furthermore, according to Donohoo et al. (2018) collective teacher efficacy, a phrase originating from the work of Bandura (Bandura, 1977, cited in Donohoo et al, 2018) can be achieved by team members i.e. teachers, having a collective belief in their ability to influence student outcomes, with collective teacher efficacy listed at the top of the list of factors influencing student achievement (Donohoo et al., 2018, p.42). Thus, another important facet of my collaboration with the T&L group throughout the project itself was in inviting members to become facilitators in supporting the initial delivery of the CPD, as well as inviting them to undertake some of the lesson observations during the intervention.

Donohoo et al. (2018) discuss the role of leaders in influencing the efficacy of interventions by encouraging teacher collaboration within an environment based on trust. The importance of trust is echoed by Lofthouse et al. (2014) in discussing teacher experiences of and engagement in research, particularly where there may be a perception of accountability or surveillance such as in a lesson observation process.

Despite being able to give assurances that an observation conducted as part of this research would be entirely focused on the research objectives, I felt that my position as a member of the senior leadership team might damage the integrity of that research in terms of influencing teacher or student behaviours, by turning the focus from collaborative professional learning towards scrutiny. Therefore, I felt that, from an ethical perspective, having at least some of the observations conducted by T&L group member rather than by myself might promote a greater sense of mutual trust between participants and researchers. I discuss this aspect further within the section of research design.

In terms of the development of the initial CPD session, the collaboration and support of the T&L group colleagues from across the disciplines meant that we were able to combine a generic introduction to the concepts of modelling and questioning with more active tasks and discussion within subject specific groups, facilitated by the T&L group members in their own departments. This supports the importance of subject specific contexts when introducing metacognition to students, as noted in the EEF's guidance report (Quigley et al., 2021, p.14). Indeed, the EEF's own editable tools were used within this CPD session (EEF, 2021).

A further objective of the collaborative approach to my intervention was to develop a sense of ownership in the change process. Because this research forms one part of a much wider whole school project, establishing an ownership of change was another important aspect of the collaboration with the T&L group, as a continuous cycle of feedback and refinement could be introduced. For example, I was able to consult group members on the draft proposals for the content of the CPD session as well as in requesting feedback on my pilot lesson observation sheet and the design of the self-reflective journal during the intervention itself. This benefit is echoed by Greany and

Maxwell in their discussion of evidence-informed innovation through collaborative research in which they also emphasise that such collaboration can, potentially, also enhance the ability of the participating teachers to critically reflect on their own practice to enhance their "technical know-how" (Greany & Maxwell, 2017, p.3). It is important to note, however, that Greany and Maxwell (2017) further highlight that ensuring effective dissemination from a core project team to the wider teaching body is essential to reap those benefits. This caveat is something that will be considered further in my discussion section, as I became aware of the 'self-selecting' nature of the both the T&L group, and also the participant group (discussed further within the research design section). This will have particular relevance as I consider the implications of my research findings and the resulting next steps for my school.

3.0 Literature Review

To support this collaborative practitioner research project, the literature review will focus on the following questions:

- What is metacognition?
- What is the relationship between metacognition and self-regulation?
- What are the links between the IB's approaches to teaching and learning (ATLs), the Ignatian Pedagogical Paradigm (IPP) and metacognitive self-reflection?
- How might teacher questioning support the development of metacognition in the classroom?

3.1 What is metacognition?

Before considering the term metacognition itself, it is observed, when reviewing the literature surrounding metacognition, that most authors comment on the degree of flexibility and, therefore, the potential lack of clarity surrounding the use of the terms metacognition, self-regulation and self-regulated learning, with the three terms being used interchangeably. There is an inherent challenge in this regard. Dowey (2023), for example, comments on the potential pitfalls that can arise when a lack of clarity can create "lethal mutations" within a classroom context. Similarly, Muijs and Bockhove (2020) and Mannion and McAllister (2020) reference the significant interest in metacognition and self-regulation within education settings whilst also noting that there a lack of clarity in the use of both terms, (Mannion & McAllister, 2020, p.53, Muijs & Bokhove, 2020, p4).

In terms of the first literature review question, that seeks to define what metacognition is within this study, Dinsmore et al. (2008) highlight Flavell's work in the 1970s, in which the phrase "thinking about thinking" is used as a conceptual definition (Miller et al. 1970, p.613, cited in Dinsmore et al., 2008, p.393). Flavell's development of the notion of metacognition, and specifically metacognitive strategies and skills is outlined further in his 1979 paper, in which a four-stage model of metacognitive monitoring is presented. This highlights the importance of the cyclical interaction between knowledge and experience; in that metacognitive knowledge of self, task and strategy, combine with metacognitive experiences, but then require the implementation of cognitive goals and strategies (Flavell, 1979). In this respect, Flavell's model emphasises the developmental benefits of "increasing the quantity and quality of children's metacognitive knowledge and monitoring skills through systematic training"; in other words, this can perhaps be seen as an early call for a 'learning to learn' curriculum (Flavell, 1979, p.910).

Schraw and Dennison (1994) discuss the nature of metacognition in terms of a learning process, and the associated strategies used at each stage: planning strategies used at the start of a learning task, monitoring used as a means of continually checking learning/efficacy of strategies, and finally evaluation in analysing not just performance but also the methods used. This three-stage process is one which is generally accepted in the literature, and also provides the structure to the recommendations in the EEF guidance report and toolkits as utilised in my own intervention.

From the perspective of this project, which aims to develop teachers' skills in developing metacognitive self-regulation through metacognitive questioning and modelling, it is also useful to focus on the recent evidence reviews of the concept of metacognition and specifically those that will have particular resonance for the

teachers taking part in the proposed intervention. Rhodes (2019) for example, provides a useful discussion of the development of the field of metacognition, specifically referring to Nelson and Narens' (1990) work in distinguishing between the assessment and evaluation of learning (monitoring) to the self-regulation arising from that information (control). This distinction is dealt with further in the section on the conceptual understanding of self-regulation (Nelson and Narens (1990) cited in Rhodes, 2019, p.168).

The 2020 EEF evidence review, conducted by Muijs and Bokhove, presents a further critique of the use of metacognitive technology. Muijs and Bokhove (2020) reference Dinsmore's (2008) analysis of the words most frequently associated with metacognition, namely monitoring, control and knowledge (Dinsmore et al., 2008, p.400), which was conducted in an attempt to draw together the varying strands into a coherent whole. These strands are echoed in Webb's (2021) practical guide to metacognition for teachers and school leaders with her definition of a metacognitive learner being one who has "knowledge and control" over their learning (Webb, 2021). The most succinct of all definitions, however, has been presented by Mannion and McAllister (2020) as:

> "Metacognition: monitoring and controlling your thought processes"
>
> (Mannion & McAllister, p.56, 2020).

This definition also specifically delineates metacognition from the associated concepts of self-regulation and self-reflection. Even within this single term, as previously noted, it is important to make a distinction between metacognitive knowledge (what one knows about one's learning, in other words the element of monitoring) and metacognitive skills (one's ability to select and use strategies in response to cognitive

tasks, in other words the element of control). Muijs and Bokhove (2020) note that the two components are equally important and, indeed interact with one another, as the use of metacognitive skills requires the application of metacognitive knowledge, which in turn includes the students' ability to assess the efficacy of their progress on cognitive tasks. In summary, the simplicity and integration of the most oft-cited terms within the literature in Mannion and McAllister's (2020) definition means that this is the working definition to be used throughout this project.

3.2 What is the relationship between metacognition and self-regulation?

As discussed above, Dinsmore et al's (2008) paper is often cited when considering the relationship between metacognition, self-regulation and self-regulated learning. The previously discussed overlaps between the use of terminology can be seen most effectively in the table below, which summaries the use of keywords in definitions of the three terms:

(Dinsmore et al., 2008, p.400)

Whilst this table shows that all three terms concern monitoring and control, it also allows differences to emerge between the three terms. Whilst self-regulation and self-regulated learning can be seen to be quite similar in terms of the use of keywords, self-regulated learning might be considered as an application of self-regulation within an education context, rather than a differentiated term in its own right (Dinsmore et al., 2008). By contrast, the table illustrates that the most oft-used keyword when defining metacognition is knowledge, and the monitoring, control and regulation of that knowledge, whereas the terms motivation and behaviour appear in the definitions of self-regulation and self-regulated learning but are rarely used in definitions of metacognition. These distinctions have particular relevance when reviewing my own

research title and methodology, therefore, in ensuring that teacher observations and reflections are categorised accurately.

Albert Bandura is frequently cited in articles discussing both metacognition and self-regulation. Mannion and McAllister (2020) provide a useful summary of the development of Bandura's work, noting as Dinsmore et al. (2008) did, that whilst metacognition considers the monitoring and control of cognition and knowledge, self-regulation considers the regulation of feelings and behaviours through human action (Mannion & McAllister, 2020, p.56). Furthermore, Bandura's (1991) paper emphasises the multi-faceted nature of self-regulation, stating that it involves a number of processes including "self-monitoring, standard setting, evaluative judgement, self-appraisal and affective self-reaction" (Bandura, 1991, p.282). However, it is pointed out by both Dinsmore et al. (2008) and Mannion and McAllister (2020) that Bandura's work was set within the field of psychology and the interactions between human behaviour and the environment. They make the distinction that the idea of self-regulated *learning* refers specifically to concepts of self-regulation applied within an academic, or educational context. Echoing the cyclical patterns in many of the models discussed in this project, Schunk and Zimmerman (1998) emphasise the cyclical nature of self-regulated learning, from 'forethought' to 'performance' to 'self-reflection', as shown below:

The figure originally presented here cannot be made freely available via ORA because of copyright.

The figure was sourced at Schunk, D. H., & Zimmerman, B. J. (1998). Self-regulated learning : from teaching to self-reflective practice (D. H. Schunk & B. J. Zimmerman, Eds.) [Book]. Guilford Press.

(Schunk & Zimmerman, 1998, p.3)

It is noted that the descriptors of each stage within the text bears considerable similarity to the rationale for recommendation two within the EEF's guidance report; in recommending a planning, monitoring and evaluation cycle (Quigley et al., 2021). This recommendation, and the associated toolkit materials will be used as a basis for my intervention. (Quigley et al., 2021, p12).

Nevertheless, Mannion and McAllister (2020) emphasise that beyond the parameters of any such model, there are extraneous factors which will impact upon the potential success of such interventions, notably student motivation, both intrinsic and extrinsic, as well as the context in which any such teaching and learning might take place, such as the degree of autonomy, or perhaps pressures of exam or deadline preparations (Mannion & McAllister, 2020, p.58). This observation takes us back to Bandura's (1991) paper on the social cognitive nature of self-regulation, in recognising the continual interplay of internal and external sources of influence (Bandura, 1991).

An interesting application of the idea of variance in motivation is explored in the work of Zimmerman and Kitsantas (2005) who discuss the motivational requirement for effective self-regulation, and notably self-efficacy for learning in terms of beliefs about one's capability to learn or perform effectively using self-regulatory processes. Their research specifically considered the completion of homework by adolescent girls in the US, with the conclusion being that the girls' approaches to homework were influenced by their self-beliefs regarding ability to learn and perceptions of own responsibility for that learning (Zimmerman & Kitsantas, 2005).

Dent and Koenka's (2016) meta-analysis provides another variant in terms of the efficacy of self-regulated learning, in considering the academic subject context. Their review of studies across a variety of subject disciplines (notably, mathematics, English,

science and social studies) indicates that the subject context potentially influences students' self-regulated learning, with the correlation between metacognitive processes and achievement being most notable in social studies, followed by science, English/language and arts and finally maths (Dent & Koenka, 2016, p.451). For example, they posit that traditional mathematics classes may constrain self-regulated learning due to the nature of tasks set and degree of prescriptiveness in terms of procedures, assessment criteria. However, the further point is made that this distinction may well be the function of both teacher and student pre-existing beliefs about the nature of the subject, and they discuss whether those beliefs might facilitate or constrain self-regulated learning depending on classroom and task characteristics (Dent & Koenka, 2016, p.462).

In a further consideration of whether potential variations in the responsiveness of students to learning about self-regulation, Donker et al. (2014) observe, in their meta-analysis of the impact of learning strategy instruction on academic performance that, when considering different demographic groupings within the studies under review (in terms of socio-economic backgrounds, children with special education needs, and students classed as gifted) there were no significant differences, with all groupings seeing a positive impact of such instruction. Their meta-analysis did not allow for a consideration of differing levels of motivation, however, and in noting that motivation is associated with improved self-regulation, this is a further area that they consider worthy of study (Donker et al., 2014, p.15). Perry et al.'s (2019) later meta-analysis goes further in commenting that research has focused in the main on the effectiveness of learning programmes as a whole, rather than examining differences between learner groups. However, they cite one study within the Dutch education system, which considered the impact of such strategies on first and second generation immigrant

children, finding that there was little difference in the receptiveness of those children when compared with indigenous children in their response to metacognitive teaching strategies such as feedback and scaffolding strategies (Pat-El, Tillema, and van Koppen, 2012, cited in Perry et al, 2019, p.491). In contrast, Bullock (2011), in her review of the literature relevant to the IBLP, notes that previously learned cultural expectations regarding how to study, and what is valued in study, are difficult to change. It might be argued that in my setting, where students enter the school in every year group and from a variety of previous institutions and countries, responsiveness to metacognitive questioning may vary based on previously established cultural norms. Furthermore, Harris and Williams (2012) observed, in their study of association of classroom interactions, year group and social class, observed that previously acquired cultural capital and discourse may mean that children from more affluent socioeconomic groupings have higher quality teacher-student interactions, which could impact upon the effectiveness of metacognitive instruction. Although variety in socioeconomic grouping is less relevant in my own setting, a variety of pre-existing cultural capital and exposure to the "dominant pedagogical discourse" certainly may impact on the equity of interaction within the classroom (Harris & Williams, 2012).

There is, however, an important distinction to make between *actual* variation in responsiveness and *perceived* responsiveness by teachers, which could imply a deficit-model approach being applied by teachers when engaging with students from multiple backgrounds (Alford, 2024). In a similar vein, Harris (2011) highlights the potential misconceptions that can arise when asking teachers to draw conclusions, in this case, about student engagement, with Harris noting that teachers tend to focus on behavioural factors rather than cognitive factors when judging engagement (Harris,

2011). This same misconception could equally be applied to perceived responsiveness of students to metacognitive awareness and regulation.

In summary, when applying the existing literature to my own context, it appears that there may be potential variation in responsiveness of students to self-regulatory training or instruction according to a variety of intrinsic and extrinsic factors. Intrinsic motivational factors may well emerge from the students' own self-reflection of the efficacy of their use of the techniques, or from teacher perceptions of the efficacy of those techniques. In terms of external factors, the literature appears to indicate that demographic factors may be relatively unimportant when considering the potential responsiveness of students to teachers' use of metacognitive strategies. However, it is noted that demographic differences do exist in the year nine classes in my school. For example, apart from English and mathematics, all classes are mixed ability groupings. The gender is split is relatively even (29 girls/36 boys). In terms of LOTE (language other than English) learners, these represent 24% of the total cohort. Therefore, it will be important to be aware of the previously discussed nuances surrounding actual rather than perceived differences in responsiveness when analysing the qualitative data from this intervention. It could be the case, perhaps, that teachers, as per a deficit model approach (Alford, 2024), perceive there to be differentials of effectiveness that they attribute to these demographic variations. Therefore, it will be important to incorporate those nuances into the evaluation of any findings.

3.3 What are the links between the IB's approaches to teaching and learning (ATL)s, the Ignatian Pedagogical paradigm (IPP), and metacognitive self-reflection?

This section aims to explore the links between the conceptual understandings of metacognitive self-reflection and how those concepts are realised within the pedagogical parameters of my own context.

The IB's approaches to teaching and learning (ATL) are outlined within a central document (IBO, 2015) which is intended to provide guidance to school leaders and teachers as to the pedagogical approach which would be expected to be cultivated within an IB world school. Judgements as to the extent to which this is achieved are made through an externally administered five-year evaluation cycle. A quote from Bruner (1977) articulates the contribution of the ATLs to the overall IB mission, but could equally be used to express the role of metacognitive self-regulation:

> "Learning should not only take us somewhere; it should allow us later to go further more easily." (Bruner, 1960, p.17 quoted in IBO, 2015, p5).

The development of 'thinking skills' is one strand within the document and it is emphasised that the development of such skills is supported by the IBO approach which is broadly constructivist and student-centred. To quote:

> "Being 'thinkers' is explicitly identified as one of the IB learner profile attributes, and is defined in terms of exercising initiative in applying thinking skills critically and creatively to recognise and approach complex problems, and make reasoned, ethical decisions." (IBO, 2015, p.8).

When considering the concept of metacognitive self-regulation discussed above, in terms of Bandura's (1991) use of terms such as 'evaluative judgement', 'self-monitoring' and 'affective self-reaction' (Bandura, 1991, p.282) it is apparent that there are clear links with the IB's pedagogical approach. In the same document it is further emphasised

that the development of metacognition is foundational to the development of other skills such as having an awareness of alternative ways of achieving outcomes or considering more efficient or more effective ways of learning. This ambition links with the positive relationship between metacognitive skills development and student outcomes, as discussed in 3.1, and has parallels with other related concepts such as Dweck's (1999) growth mind-set theories. For example, making effective reflective judgements based on feedback, according to Dweck, has a consequent motivational impact on students in terms of their belief of their incremental ability to improve academic outcomes through skills development (Dweck, 1999).

Furthermore, when considering linkages between specific curriculum-led approaches and the previously discussed academic literature, Zimmerman's (2000) discussion of self-reflection in terms of processes that occur after each learning experience has synergy with the IBO's emphasis on reflection as an essential element of learning, to the extent that structured reflection activities are an intrinsic element of IBO syllabi and, indeed assessment content. Within the Theory of Knowledge syllabus, for example, there is an emphasis on cognitive reflection in terms of inquiry questions explored within the core 'knowledge and the knower' section (IBO, 2020). Within the Extended Essay guide the emphasis is on student self-reflection upon on the skills gained through the process of research itself, with the most successful students being able to show that they can "consider their actions and ideas in response to challenges" (IBO, 2016, p.41). Although students will only meet these specific syllabi should they choose the IB Diploma, as stated previously there is a commitment to embrace the IB's pedagogical approach throughout my school. The fact that engaging students throughout the school may mean that they will already developed skills which would

be of immediate relevance, should that be their chosen pathway, is an additional benefit to be gained through the introduction of such a study skills programme.

As well as considering approaches to learning, the IBO (IBO, 2015) also considers how the development of ATLs might impact on how teachers view their role in classrooms, referencing a continuum of the teacher regulation of student learning, from strong teacher regulation, with minimum student thinking and maximum teacher control, through to loose teacher regulation, where the teacher's only function is to supply objectives and assess against them rather than being involved in teaching and learning directly and student thinking is maximised (IBO, 2015, p.32).

The document recommends that the 'shared regulation' style would be an "excellent means" to develop student self-regulation, and furthermore discusses the use of process-orientated instruction in that the focus of teaching is on the teaching of strategies of techniques which are metacognitive in nature, citing Bolhuis (2003) in discussing the teacher role such as use of modelling, demonstration, monitoring and building metacognitive awareness (Bolhuis, 2003, cited in IBO, 2015, p.32).

A final note on the synergy between the IBO's pedagogy and metacognitive self-reflection, which also leads into the discussion surrounding the IPP, is the underpinning principle of inquiry learning and the inquiry learning cycle:

The figure originally presented here cannot be made freely available via ORA because of copyright.

The figure was sourced at IBO. (2015). Approaches to teaching and learning in the Diploma Programme. International Baccalaureate Organisation.

(IBO, 2015, p.19)

The IBO's view is that following an inquiry-based approach allows students to develop better inquiry skills, such that they are enabled to become "self-managed, self-directed, self-regulated" (IBO, 2015), which adds further weight to the commitment to adopt such practices throughout the school by means of a coherent cross-school pedagogical approach, rather than limiting such skills only to those students accessing the IB Diploma.

Even more fundamental to my school's context is the commitment to Ignatian pedagogy, as encapsulated within the Ignatian Pedagogical Paradigm (IPP). As has been previously stated, it is the school's aim to "accompany teachers in their mission as Ignatian educators" (School A, 2022). There is considerable alignment between the previously illustrated IBO inquiry cycle and the IPP when considering the model below:

The figure originally presented here cannot be made freely available via ORA because of copyright.

The figure was sourced at Jesuit Institute. (2014). Ignatian Pedagogy An abridged version of the document on teaching and learning in a Jesuit school. Jesuit Institute.

(Jesuit Institute, 2014, p.11)

As stated in the Jesuit Institute's (2014) abridged guide to teaching and learning in a Jesuit school, summarising the 1993 document Ignatian Pedagogy: A practical approach, "this continual interplay of experience, reflection and action lies at the heart of the Ignatian pedagogy." (Jesuit Institute, 2014, p4). In a similar vein to the IBO's document, there is an emphasis within this paradigm on the role of the teacher in encouraging students to not only take greater responsibility for and be more active in their learning but also to reflect upon the learning experiences undertaken to choose appropriate courses of action (Jesuit Institute, 2014, p.6). This principle echoes the development

of self-regulation and self-efficacy as previously highlighted by Mannion and McAllister (2020), referencing Bandura and Dinsmore et al, (Mannion & McAllister, 2020, p.56). However, it is interesting to note that the IPP image also emphasises the importance of context, notably the student context. This has synergy with the discussion in 3.2 of the extent to which contextual factors might impact on self-regulation and student self-efficacy and would suggest that, in a Jesuit school, an asset rather than deficit-based approach that recognises the importance of home contexts and cultures should be followed. Of course, the unique differential between the IPP and the IBO's inquiry cycle is that the IPP is not a secular model, but rather a pedagogy inspired by faith and specifically the teachings of St. Ignatius. Nevertheless, Nowacek and Mountin (2023) emphasise that when discussing 'action' resulting from experience and reflection, approaching such a concept even from an entirely secular perspective might result in actions within a "clear moral charge" (Nowacek & Mountin, 2023, p.137). They go on to suggest that Ignatian pedagogy can instil a deeper understanding of "knowledge-in-action" which implies a mastery of a topic to a level which allows the movement from "mere consumers to becoming producers of knowledge" (Nowacek & Mountin, 2023, p.137). Fr. Mesa SJ (2013) makes the valid point that "this common style of education becomes Ignatian when it is imbued with the spiritual vision of Saint Ignatius" (Mesa SJ, 2013, p.182). However, Hayes (2006), in his exploration of the implementation of the IPP within Jesuit schools in Australia, interestingly regards this recognition as a potential paradox, with teachers referring to the IPP generally as "good teaching practice" (Hayes, p.4, 2006) whilst also struggling with the ecclesiastical/religious terminology which is presented as part of the IPP documentation. At the same time, Hayes also notes that the IPP documents cite accepted relevant educational theories, such as cognitive, or indeed constructivist theories (on which the IBO's ATLs are

based) which might give greater credence to teachers attempting to implement the IPP within the classroom (Hayes, p. 170, 2006). When considering the desire of my school to develop a more explicitly Ignatian pedagogy, the observation as to whether that shared ecclesiastical/religious terminology is genuinely utilised by both teachers and students will be one which will be considered as part of my data collection.

Further synergies between the accepted theories of self-reflection, the IBO's pedagogical approach and the IPP emerge when considering the role of evaluation as part of the core planning-monitoring-evaluating metacognitive cycle. Within the context of the IPP, the term evaluation refers to the evaluation of student progress, in other words assessment. However, the model for such evaluation appears firmly rooted in assessment as an opportunity for a "discussion of growth", including such elements as mentoring, student self-reflection and journalling (Jesuit Institute, 2013). Nowacek and Mountin refer to this evaluation as "meta-reflective processes" (Nowacek & Mountin, 2023, p.138) and emphasise the benefit of embracing and indeed coaching students on such a meta-reflective process, relating it to the positive effects of metacognitive reflection.

The synergy between the IPP and the IBO's pedagogical approach to evaluation can be seen further when reviewing evaluation as an intrinsic element of the IBO's assessment methodology, sometimes framed as 'personal engagement'. For example, within the IB's extended essay assessment criteria, 6 of the 34 marks are allocated to the personal engagement criterion which asks students to self-evaluate their decision-making and planning and their ability to consider responses to challenges faced through the process (IBO, 2016, p.107). In recognising these synergies, Fr. Mesa (2013) references a memorandum of agreement between the Jesuit Secretariat for education and the IBO, demonstrating the interest of Jesuit schools in IB programmes and recognising

that the two organisations share "similar purposes" (Mesa SJ, 2013, p.182). As such, it can be seen that not only is there is a cohesion between both the IPP and the IBO's pedagogical approach, but also cohesion between these two models and the overarching conceptual framework of metacognitive self-regulation.

Finally, when exploring the literature surrounding Ignatian pedagogies, Nowacek and Mountin (2023) observe that "scholarly publications from instructors conducting "what is" or "what works" inquiries related to Jesuit goals or methods in their own classrooms are rare" (Nowacek & Mountin, 2023, p.132). This observation, as well as the IBO's own recommendation that a strategy to effectively embed ATLs into a whole school culture might be to "encourage DP teachers to engage in action research" as a way of not only providing effective PD for teachers and positive impact on student learning (IBO, 2015, p.44), adds an interesting additional imperative to the aim of my own practitioner research into an exploration of teachers' perceptions of the effectiveness of metacognitive questioning in their classrooms.

3.4 How might the teaching of metacognition support the development of metacognitive self-regulation in the classroom?

Zimmerman, writing in 2002, notes that teaching self-regulatory strategies and practices is especially relevant when responding to the student need to develop life-long learning strategies, but he also references his own previous conclusion that "few teachers effectively prepare students to learn on their own" (Zimmerman et al., 1996, referenced in Zimmerman, 2002). More recently, however, there has been an increasing amount of interest in such needs and a resultant increase in intervention studies, as noted by Dignath and Buttner (2008) in their meta-analysis of 74 studies, with the authors concluding that self-regulated learning can be developed effectively through interventions, albeit with the same caveat that more research is needed about how best to support teachers in effectively implementing those strategies (Dignath & Büttner, 2008, p.258).

Furthermore, Perry et al.'s (2019) review of the international literature in 2019 has parallels with Muijs and Bokhove's (2020) evidence review in concluding that there is a positive relationship between teaching metacognition skills and student outcomes, including studies indicating that the acquisition of metacognitive skills may compensate for limited cognitive ability. They reference Veenman and Beishuizen (2004), for example, who suggest that "metacognition accounts for around 17% of a child's ability to be successful at school" (Veenham, M and Beishuizen, J, 2004, cited in Perry et al., 2019, p.485). Perry et al. (2019) also reference the impact of the EEF's metacognition toolkit, in terms of the 'low-cost, high impact' judgement, as previously noted.

However, it is important to consider the timeframes required to establish any quantifiable impact (Mannion, 2021) and it is also interesting to note the critique within Perry et al.'s paper in terms of the EEF and other's reliance on quantitative data to

make impact judgements, including the issue of Randomised Control Trials. In their own evidence review, for example, quantitative studies outweigh qualitative by 29:2. Furthermore, the authors note that there is a significant challenge in any study of metacognition in that there remains a lack of reliable tools to establish a clear causal relationship between metacognitive instruction and changes in learning outcomes (Muijs et al., 2014, cited in (Perry et al., 2019, p.492). These insights, combined with an awareness of the small-scale, time-limited nature of my own intervention, have influenced the focus, in my own research methodology, on qualitative data collection, as well the thematic analysis of that data (rather than attempting to establish causal relationships). This is discussed further in the methodology section.

In terms of the role of the teacher in developing effective metacognitive awareness and self-regulation, Muijs et al. (2014) establish three principles for effective metacognitive instruction: firstly, that such instruction should be embedded within subject content, rather than in the abstract, secondly that learners should be specifically informed as to the beneficial impact of metacognitive strategies, and thirdly that prolonged training is needed to maintain metacognitive activity (Muijs et al., 2014, pps. 240-241). These principles are important ones to be integrated into my own intervention as well as the future planning of the integration of metacognition within the longer-term study skills-project.

When considering the nature of such teacher intervention or 'teaching' of metacognition and metacognitive strategies, Muijs and Bokhove (2020) note that there are two broad approaches:

- Direct approach – explicit instruction and implicit modelling

- Indirect approach – by creating a 'conducive learning environment', such as enquiring dialogue and guided inquiry

(Muijs & Bokhove, 2020, p.27).

Muijs and Bokhove (2020) conclude that a mix of approaches is necessary, but that an explicit teaching of *strategies* is an essential element of a successful intervention. Thus, within my context, and the previously stated observation by ISI that 'study skills' are an area for development, it is more appropriate for my own intervention to be based on explicit teaching and modelling of metacognitive strategies.

These principles are summarised within the second recommendation of the Metacognition and Self-Regulated Learning guidance report (Quigley et al., 2021a). Although this recommendation references 'explicit teaching' there is a distinction made within the recommendation between 'teaching' in the traditional sense of teacher exposition, rather highlighting the recommendation for teachers to scaffold the use of student's own self-regulation using guided metacognitive questioning, with the recommendation being that strategies are most effective when applied to specific content or tasks and therefore should be taught in that way (Quigley et al., 2021, p.6). As an example of how this might be enacted, King's (1991) study compared the use of guided metacognitive questioning by students working in pairs to solve problems, as opposed to unstructured questioning by the control group and so highlighted the positive impact in terms of the students' ability to be 'strategic problem solvers'. Within this conclusion King also elaborates on the fact that to promote such strategic decision making, some form of 'procedural facilitator' is required as a 'temporary prompt' (King, 1991, p.315-316). This adds weight to the view that explicitly teaching scaffolded and structured metacognitive questioning techniques builds self-regulating

behaviours, whilst echoing the EEF's sixth recommendation that initial scaffolding should gradually be withdrawn as students become more proficient and, having received effective feedback on their use of strategies, the students can gradually become more independently self-regulating (Quigley et al., 2021, p.7).

Muijs and Bokhove (2020), in discussing the implementation of metacognitive interventions emphasise that, when considering differential impacts, it is important to consider issues associated with the implementation of that intervention, and notably, that supporting teachers with extensive professional development is a key element of successful interventions. This is echoed in the EEF's recommendations within the guidance report on metacognition and self-regulated learning (Quigley et al., 2021). The authors note that:

> "As with any changes to classroom practice and pedagogy, teachers will need a lot of support, training, and time to practise in order to implement them"
>
> (Quigley et al., 2021, p.26)

Muijs and Bokhove's (2020) evidence review suggests that the most successful CPD initiatives included external involvement, either by CPD delivery, resources or ongoing support (Muijs & Bokhove, 2020, p.42). Furthermore, a useful case study from the EEF (2023) in the delivery of an effective CPD strategy on metacognition, emphasises a four-stage approach of building knowledge, motivating staff, developing teaching techniques and then embedding that practice (EEF, 2023). This strategy echoes the guidance given by Quigley et al. (Quigley et al., 2021) in providing time and practical support as well as an encouragement to use self-monitoring as part of embedding practice. The use of self-monitoring reflects the self-regulation aspect of the aforementioned Muijs et al. teacher enquiry cycle which is to be used as the basis for my intervention structure (Muijs et al., 2014)

An interesting evaluative point raised by Muijs and Bokhove is that too great an intensity of materials, resources and monitoring might lead to greater attrition rates by teachers, due to the perceived increased burden (Muijs & Bokhove, 2020, p.43). This is echoed in the EEF guidance report, as well as in the IBO's (2015) advice on pedagogical leadership, in that it is important that the support of student self-regulation is not seen as 'new' or 'extra' but instead can be integrated into normal classroom practice (Quigley et al., 2021). These challenges, in the development of effective CPD, the context-driven presentation of potential metacognitive strategies, and the evaluation of the teacher self-perceptions of their impact are all factors to be considered in developing my intervention design.

3.5 Conclusion to literature review and formation of research questions

To summarise the review of the literature, it is first noted that a definition of metacognition is the subject of some discussion. However, there is coherence around the concepts of both knowledge of, as well as control of one's learning and therefore the working definition selected from Mannion and McAllister (2020) is the one to be used both in the intervention process and henceforth in this paper.

> "Metacognition: monitoring and controlling your thought processes"
>
> (Mannion & McAllister, p.56, 2020)

Secondly, the literature indicates that in order for students to move from metacognitive awareness to effective self-regulation, there is an imperative to also consider additional factors such as intrinsic and extrinsic motivations and behaviours. My exploration of the literature has drawn out important elements such as the interaction between that behaviour and the environment, notably the interplay between internal and external sources of influence (Bandura, 1991). This has implications for my own thematic analysis of the findings from the observations and self-reflections of teachers undertaking the intervention.

The body of literature surrounding both the IB's ATLs as well as the IPP indicates that there is a genuine synergy between these two pedagogical approaches and the cyclical nature of metacognitive self-regulation, notably within the coherence with which all models emphasise the importance of skills development and self-monitoring and reflection upon that development. In considering the literature on the IPP, as Nowacek and Mountin (2023) observe, the body of evidence is weighted towards an exploration of the principles of the paradigm and application of those principles rather than an

analysis of efficacy or 'what works' in terms of the application of pedagogical practice within classrooms (Nowacek & Mountin, 2023). This has added an additional relevance to my chosen intervention within my own context and the school's long-term strategic plan.

The final section of my literature review has informed the design of my intervention in terms of the role of the teacher in supporting metacognitive awareness and self-regulatory behaviours. The literature suggests that both explicit and implicit teaching of metacognition and metacognitive skills is required with the body of evidence suggesting that some explicit teaching is a necessary component, and that student outcomes can be positively impacted by explicit teaching using metacognitive questioning techniques to build self-regulatory behaviours (King, 1991). This section also considers the role of teacher support provided by schools and the crucial role of CPD in the successful implementation of interventions aimed at developing that metacognitive awareness and self-regulation.

When considering the weight of evidence across all sections, it is important to note that the majority of the interventions and meta-analyses took place over the long term, and indeed even the CPD is recommended to take place over at least two terms (Quigley et al., 2021). This contrasts with the time frame of my own intervention. This observation, as noted previously, has influenced my choice of qualitative thematic analysis focusing on perceptions and observations by teachers rather than quantifiable impacts as the parameters on which I will base my discussions.

In conclusion, a critical review of the literature on this topic has allowed me to develop the following research questions, in order to explore how the impact of developing

teachers' metacognitive questioning skills on metacognitive self-regulation in the classroom.

Overarching question:

How does the development of teachers' skills in metacognitive questioning impact students' metacognitive regulation in their classrooms?

a. What factors might impact the extent to which teachers use metacognitive questioning techniques in their classrooms?
b. What factors might impact the extent to which the students in those classrooms respond to metacognitive questioning?
c. How do teachers perceive the extent to which questioning to support metacognitive self-reflection impacts upon the level of metacognitive regulation in their students?

4.0. Research design

To address my research questions, a multi-stage intervention was designed:

4.1 Design of initial CPD on metacognition

In January 2024, having received ethical approval, I designed, with the Director of T&L, the initial CPD introducing metacognition and the EEF's metacognitive modelling and questioning toolkit, which would include an invitation to take part in the research. We sought the support of the already established T&L group of teachers in reviewing the draft design of the initial input and table activities, and this group of teachers were also stationed amongst the tables as 'champions' to support the teachers and guide discussions.

The CPD session was delivered jointly by me and the Director of T&L, supported by our T&L group colleagues. Exemplars of the materials and tasks are presented in Appendix 5. I was conscious that this 'in-house' approach was contrary to the recommendation of Muijs and Bokhove (2020), referenced in the literature review, to have external resourcing in supporting the introduction of a new pedagogical strategy. This may, therefore, be a factor in influencing the extent to which teachers feel confident in implementing changes in their practice from those suggested in our initial CPD (as per my first research question). Therefore I aim to address teacher perceptions of the efficacy of this session in my data collection.

The session was designed using the EEF's guidance for effective professional development (Collin & Smith, 2021) in that it contained:

- Building knowledge – what is metacognition?

- Motivating teachers – referencing literature regarding links to improved academic outcomes, and our own context specific issues of perceived passive learners
- Developing teaching techniques – introduction to EEF toolkit, use of videos and case studies, including short answer quizzes to establish pre-existing knowledge and gaps in understanding
- Embedding practice – subject specific table groups discussing application of the planning/monitoring/evaluating question framework into subject specific context. These groups were supported by the T&L group champions in offering some subject specific expertise to facilitate teacher knowledge development.

A potential challenge to the positivity of teacher response is raised by reference to Muijs et. al.(2014) in that the initial goal within the teacher enquiry and knowledge-building cycle, could be perceived as having been selected by the T&L group (or, even worse, being entirely driven by my own research project) rather than being selected by the teachers who were to receive the training. As such that goal could be perceived as belonging to "others" and thus teachers may then "choose whether to engage or resist" (Muijs et al., 2014, p.247). Establishing a strong rationale for that choice, and the emphasis on the shared goal (albeit within the T&L group) was central to the whole session, hence the use of the quantifiable evidence of the EEF as well as school-specific contextual references which would add resonance to teacher understanding of the rationale.

Towards the end of the session, teachers were invited to take part in the research of these techniques in our year 9 classes over the course of the forthcoming term. In inviting teachers to take part, I was conscious of my leadership position, both as

Director of IB and a member of the senior leadership team. This might mean that colleagues, particularly those who are part of my line-management team, may feel obligated to 'volunteer'. Therefore, as per the CUREC AP-15 (Central University Research Ethics Committee (CUREC, 2019) approved procedure I sent an open invitation to all teachers by email, including the AP-15 teacher information sheet about the project, as well as an indication of the likely level of commitment required. I then gave all initial respondents an opportunity to opt-out of the process before proceeding further. A copy of the AP-15 teacher information sheet is shown in Appendix 2.

4.2 Participant recruitment

I was pleased to receive favourable follow-up responses from seven teachers, from a variety of subjects. For ease of data analysis, their details are provided below:

Teacher	**Subject**	**Pseudonym**
1	English	Teacher A
2	English	Teacher B
3	Religious Studies	Teacher C
4	MFL	Teacher D
5	MFL	Teacher E
6	Physics	Teacher F
7	History	Teacher G

In evaluating the participant constituency group, I became aware that there was a degree of 'self-selection' in terms of who volunteered to take part in the research. One was the director of T&L (also an English teacher), one had previously undertaken the MLT course and had empathy for a colleague also undertaking such a challenge, one had attended the University of Oxford themselves and another had completed a doctorate and had an interest in educational research, being also part of the T&L

group. Thus, as per Muij's et al.'s (2014) observation of teachers choosing to engage or resist, it might reasonably be assumed that this group of participants were already willingly engaged in the pursuit of knowledge building. A further challenge, therefore, remains in terms of engaging with the wider teaching body and developing a genuine widespread professional learning community. Stoll and Kools (2017) emphasise the dual importance of creating and supporting learning opportunities for all staff (rather than just some) notably through team learning and collaboration (Stoll & Kools, 2017, p.9) and the challenge of accessing the time and resources required to implement such a programme is one that will be examined further in the discussion section.

4.3 Collaborative data collection

An important aspect of my research design was to continue to involve the T&L group beyond their role as subject champions in the CPD session and for them to be involved in the collection of data from the intervention. At the same time as inviting participants to take part in the research, therefore, I also invited members of the T&L group to take part in the lesson observation process. Three members of the group volunteered to undertake lesson observations, with their roles outlined below:

Teacher researcher	**Role in organisation**
Teacher researcher 1	Teacher of chemistry
Teacher researcher 2	Head of psychology
Teacher researcher 3	EPQ coordinator and Careers/University advisor

As previously noted, I felt that this collaborative aspect was important in terms of reducing the potential for lesson observations to be regarded as scrutiny (in view of my role within the Senior Leadership team) and I also felt that this would generate a more authentic observation of the lesson. Due to the observational field notes being

made by colleagues who were representative of a wider spectrum of the organisational hierarchy, I felt that such collaborative data collection would emulate the benefits, as outlined by Hargreaves (2019) and previously discussed, of collaborative professionalism. It would also, potentially, add additional credibility when potential findings were presented to the wider staff body. I held a briefing session with these colleagues to give guidance on making field notes during the lesson observation, based on Thomas' (2023) recommendations, as well as giving them the opportunity to comment on the initial lesson observation form that I had designed. In evaluating the contribution of colleagues to the data collection process, I was aware that this was introducing an additional layer of inconsistency in view of individual researchers, particularly in view the largely qualitative comments to be recorded as field notes. Nevertheless, in terms of the benefits of continuing to be aware of the need to remove an inevitable power dynamic from the observation process, I felt that this potential inconsistency could be managed by being aware of this factor when analysing the notes.

4.4 Ethics

Having recruited a participant group, I held a further briefing session for those participant teachers. From an ethical perspective, the session gave participants an opportunity to ask questions about the toolkits themselves as well as the methodology to be undertaken, but importantly, also allowed them to raise potential misgivings or concerns.

At the end of the briefing session, I then reminded all participants that they were free to withdraw from the research, now that they had a clearer understanding of the time

commitment and methodologies involved. All participants remained part of the intervention group and submitted their consent forms.

Once consent forms had been received from the participant group, I sent AP-15 briefing sheets along with opt-out forms to the students and parents of these teachers' year 9 classes. The briefing sheets are shown in Appendices 3 and 4. It was interesting to note that most students would meet the intervention tool more than once, and so this would potentially allow a strand of analysis in terms of student responses within different contexts.

I did not receive any opt-outs, and in fact received some very positive comments from parents who were pleased to see this intervention being undertaken.

In briefing participants as to the methodology to be followed, it is worth noting at this point that I had originally intended that the major element of data capture regarding the potential impact of the strategies on metacognitive regulation behaviour in the classroom would be through the lesson observations conducted by both me and my T&L group colleagues. I had intended using a structured observation form, to gather quantitative data about behaviours, as stated in my ethical approval form (EDUC_C1A_23_350), the approval letter for which is shown in Appendix 1. I had also intended to use video recordings of those lessons to provide a greater depth of qualitative data regarding teacher and student interactions. However, during informal conversations with my potential participants prior to the briefing sessions it became apparent that there was a degree of discomfort regarding the use of video to capture data. I felt that a contributing factor to this was my role as a member of SLT, but also there was a sense that the use of video switched the balance from a professional learning/coaching intervention as per Muijs et al.'s cycle (Muijs et al., 2014) and instead

veered into the realms of scrutiny. Therefore, to ensure that I continued to follow the University of Oxford's code of conduct for ethical fieldwork (Picot & Grasham, 2022), I adapted my methodology such that no video would be used, and decided that I would limit my own classroom observations as much as possible. The observations that I did were of colleagues who held similar levels of responsibility and thus I felt that this may mitigate perceived hierarchical disparity issues.

This adjustment also meant that the self-reflective journal to elicit teacher self-reflections of their use of metacognitive questioning became a more significant data collection instrument. On reflection, I also felt that this meant my methodology had greater coherence with the conceptual basis of Muijs et al. teacher enquiry and knowledge-building model in encouraging teachers to become more self-regulating learners themselves (Muijs et al., 2014, p.247).

4.5 Classroom Intervention

The classroom intervention itself was conducted over the second half of the Easter term. I had hoped to start the intervention earlier, but the time constraints of asking for volunteers, sending out and giving time for opt-out and consent forms to be returned, as well as organising a time for all participants to attend the briefing meant that it was not feasible to use the first half of the Easter term (which was only five weeks long).

Participants were asked to utilise the metacognitive modelling and questioning strategies in their year 9 classes over the duration of the second half of term (five weeks in total).

Participants were also asked to fill in a self-reflective journal after each lesson. The journal contained guidance sheets to help participants plan their metacognitive strategies for each lesson, as well as a follow-up self-reflection journal page for the same lesson. Exemplars of the journal as well as example completed sheets are contained in Appendices 6 and 7. From an ethical perspective it was important to stress to participants that the journal should reflect the realities of how their own reflections upon how the model worked in their lesson, rather than what they thought their reflections 'should' be. It is recognised that self-reporting has limitations, particularly when participants may focus on what might be perceived to be a 'desired' outcome. However, the use of a regular reflective journal meant that the participants could carry out the intervention within their own time constraints, without the intrusion of an observation which might, in itself, skew the realities of the practices within the classroom. Further, as previously noted, this method better fulfils the self-reflective nature of the Muijs et al.'s cycle (Muijs et al., 2014).

When designing the self-reflective journal format, I used the guidance from Denscombe (2017) in ensuring that three elements were covered:

- Factual data
- Significant incidents
- Personal interpretation

Nevertheless, I recognise the inherent limitations built into this method, as observed by Denscombe that diaries can only be seen as a 'version' of things, as filtered by the participant experience, identity and personality (Denscombe, 2017, p.274).

In addition to participant self-reporting, one lesson was observed for each participant during the five weeks (seven lesson observations in total). The observation form was

designed to complement the reflective questions in the journal with the aim being to capture similar themes from an observer's perspective and was designed to elicit field notes rather than observable tick-box formats. I sent my draft form design to my fellow T&L group members who were undertaking the observations, and integrated their feedback into the final form. The final observation form and an exemplar completed form are shown in Appendices 8 and 9. A summary of the completed observation forms is then shown in Appendix 10.

The final element of data collection took place in an hour long semi-structured interview which took place after the intervention process had finished, and as part of the following term's INSET day programme. The questions were broadly framed around my research questions, but participants were given the ability to develop responses from these initial questions. A copy of the planned questions is shown in Appendix 11.

The design of both the observation form and the semi-structured interview questions deliberately followed the advice of Denscombe (2017) in that the data to be collected would be in a relatively 'raw' state, such that it would be relatively unstructured, and from which themes would emerge. (Denscombe, 2017, p.159).

5.0 Findings – Methodology

In terms of an overarching methodological principle, I had initially considered using a grounded theory-style approach to evaluate the qualitative feedback from teachers on the extent to which they considered such skills development had had an impact on the learners in their classrooms. My literature review had highlighted the fact that quantifiable findings from such a short timeframe interview would be unlikely to generate an identifiable impact, with Muijs and Bokhove (2020) noting that most interventions were of at least a term, with at least one session per week and more typically lasted a whole school year, hence my choice of qualitative data only. However, one of the further challenges raised within the variety of meta-analyses that I considered in my literature was how to measure metacognition and the difficulty of establishing a causal relationship between input and output. Therefore, since grounded theory is dedicated to generating a plausible theory from the data gathered (McLeod, 2001, cited in Braun & Clarke, p.81, 2006), I realised that to categorise my research as such would be inappropriate. Therefore, I was drawn to Braun and Clarke's (2006) work on thematic analysis and the notion that thematic analysis is a "method for identifying, analysing and reporting patterns (themes) within the data"(Braun & Clarke, 2006, p.79). I felt that the relatively open-ended nature of my data, particularly from self-reflection journals would lend itself to this methodology. In particular, I noted that the recursive process, as described by Braun and Clarke (2006) would be beneficial as a structure for analysis. Thus, as a first stage, I considered the observation feedback, read the self-reflective journals, and then reviewed and re-rewrote my field notes from the post-intervention semi-structured interview such that I became entirely familiar with the data available to me. I then revisited all of the data and identified patterns,

using a simple inductive coding system, as shown below. This use of this coding system is illustrated in the coded transcript of the semi-structured interview in Appendix 12:

Topic	**Code**
Attrition from methodology	A
Collaboration – students	Cp
Collaboration - teachers	Ct
Differentials - ability	Da
Differentials – culture	Dc
Differentials – language	Dl
Differentials – task	Dt
Impact - behaviours	Ib
Impact - outcomes	Io
Impact - speed	Is
Student self-regulation	SR
Reflective practitioner references	RP
Stage of cycle	SC
Subject specific context references	SSC
Teacher time needed	Tt

This inductive coding mechanism supported the identification of themes in each of the three data sets, which are presented in the following section. As per Braun and Clarke's (2006) methodology, I then revisited the data as a whole to elicit final themes, These are presented in the discussion section.

6.0 Findings – initial analysis of data and identification of themes

As per the initial stages of Braun & Clarke's (2006) thematic analysis process this section is intended to give insight into the data collected and to identify the initial themes emerging from each data set.

6.1 Self-reflection journals

6.1.1 use of planning template

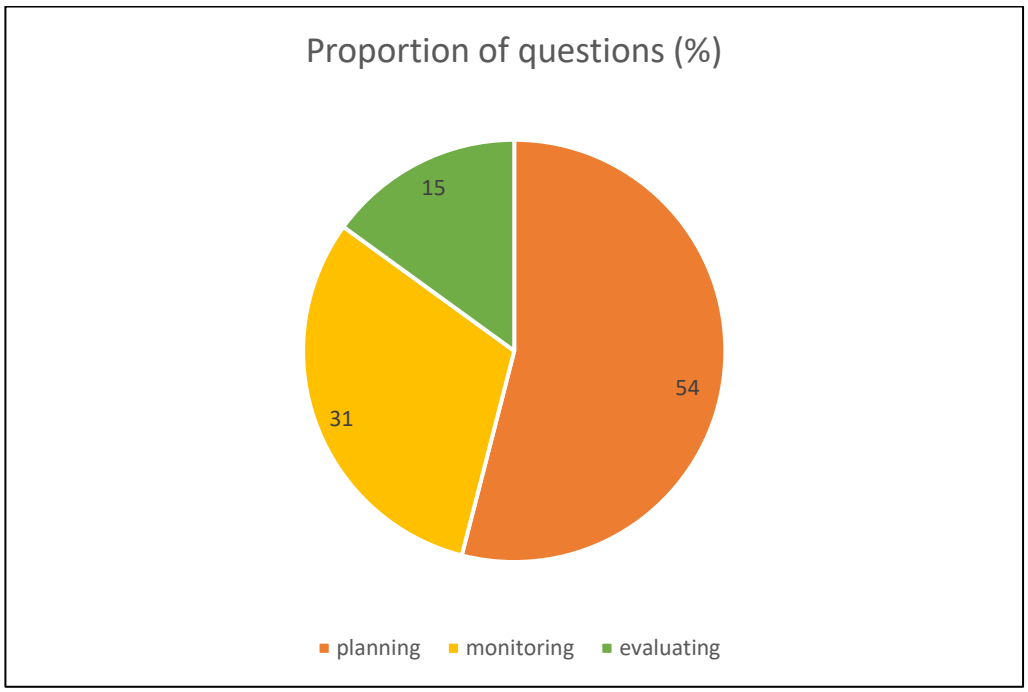
The self-reflection journal booklets were intended to work as both a planning tool for teachers and a set of post-lesson reflection points. In terms of the planning tool, teachers used the templates in a variety of ways; some used them to plan their own subject specific questions, others highlighted questions which might be useful. Teacher F used the questions to prompt their own planning/monitoring/evaluating process. However, three teachers (teachers C, D and E) did not complete the self-reflection journals, citing a lack of time. This echoes Muijs and Bokhove's (2020) comment about attrition rates resulting from what might appear to be over-burdensome aspects of new pedagogical approaches. This lack of consistency of use gave an early indication of the variations in how this data collection method would be used by the teachers within the participant group and thus may signal a potential limitation in drawing clear conclusions from the self-reflection evaluations.

6.1.2 use of post-lesson evaluation template

The first section of the post-lesson evaluation template allowed teachers to record on a tally the types of metacognitive questions being asked within the lesson. Results indicated that teachers used planning metacognitive questioning most frequently, in encouraging students to start their task, followed by monitoring and then post-task

evaluations. Those proportions were borne out in the peer observation records analysed in the next sub-section.

The proportions are indicated below:



The next section of the template provided a series of prompts to support more open-ended teacher self-reflections of the lesson. The following themes were identified from the journal entries:

a. Differentials in student response to metacognitive questioning

Responses from teachers indicated that student engagement with metacognitive questioning varied, and furthermore that the nature of that variation was inconsistent across subject areas. In English, for example engagement was observed from most students, with both Teacher A and Teacher B noting that most students responded well to the type of questioning, but lower ability students found it more difficult to articulate their response, with some remaining passive in response to the questioning, and others not understanding what they were being asked to think about. Likewise in

history, Teacher G noted that some were happy to engage with metacognitive questioning, recognising, for example "I'm doing this to work out my answers", but the teacher felt that others needed to be encouraged to go back to previous work to understand the methodology. In contrast, in physics, Teacher F felt that higher ability students were more resistant to the use of a scaffold as a way of modelling the task. Furthermore, those students found such questioning quite repetitive as the sequence of lessons carried on, despite being able to recall the term 'metacognition' and recognising when it was being used.

Teacher G noted that this reluctance to engage independently with metacognitive reflection was more apparent in EAL students who, the teacher felt, required a greater degree of scaffolding before feeling confident. Teacher G expanded this comment by discussing a potential additional cultural challenge in history in encouraging students to work metacognitively as some of the students commented that in their home countries there had been a heavy emphasis on learning of facts rather than the way in which they were being taught now. This may echo Bullock's (2011) discussion of the impact of cultural values supporting particular learning traits or skills, but equally may reflect something of a deficit model approach, and this will be revisited further in the discussion section.

b. Impact on learning behaviours

This prompt asked teachers to reflect upon whether they noted any impact of the metacognitive questioning on learning behaviours in their class. Again, responses were variable. In the history class, Teacher G observed that the SEND students within the cohort were particularly positive when asked MCQs such as "how could we find this out?" "what do you already know?" and came up with lots of follow-up ideas. By the

end of the lesson sequence, the teacher felt that students seemed more confident and keener to get on with the task and also that they were proud of their independent approach. In English, Teacher B, who taught the higher ability group, felt that students were spending longer thinking about responses to questions and gave more detailed responses. At the end of the sequence, the teacher felt that students were able to confidently talk about the strengths and weaknesses of their assessment. Teacher A, who taught the lower ability English group, also felt that metacognitive learning behaviours could be observed in some cases, with some students being more independent and perhaps "less hands up" during a structured task. In physics, by the end of the lesson sequence, Teacher F felt that some students were more familiar with the metacognitive process and were "getting used to the idea of doing more thinking for themselves".

c. Impact on learning outcomes

This prompt was distinguished from the one above in that it prompted teachers to recall instances of observable changes in learning outcomes/attainment rather than behaviours. As has been noted previously, it was not anticipated that any observable impact in this respect would be seen in such a short time frame, but for the purposes of completeness I felt it was important to acknowledge that limitation through this prompt. It was interesting to note, therefore, that Teacher A (lower ability English) did feel that in the extended piece of writing at the end of the lesson sequence, the students, overall, wrote more than usual (which might be regarded as an improved outcome, albeit without a comment regarding the quality of that output). However, this was caveated with an observation that much more would need to be done on revisiting strategies on a regular basis. Teacher B (higher ability English) observed that students were able to use their previous reflections to write an analytical paragraph,

and saw further impact when students completed a timed responses with greater engagement with the assessment criteria. In physics, Teacher F felt that an impact on outcomes could not be observed "yet" but was happy with the level of engagement with the process itself. Similarly, in reflecting on this prompt Teacher G (history) wrote more about the level of confidence in the classroom, as well as students being proactive in seeking and responding to feedback, rather than measurable outcomes.

d. Evaluation of benefits and challenges of using the metacognitive framework

This section, along with an overall reflection, allowed teachers an opportunity to reflect on how they found using the metacognitive questioning cycle in their lessons. Teacher responses were honest in discussing the challenges of a different approach, with a common theme being the adjustment to changes in wait time. Previous research would suggest that longer wait times (the duration of pauses between verbal interactions) might be associated with higher levels of cognitive learning (Tobin, 1987) and an acknowledgement of that link appears in a number of the journal entries. Teacher A (lower ability English) commented on the challenge of being conscious, when questioning of waiting for 'think' time rather than just giving the answer. Over the sequence of lessons, teacher A further reflected upon how these questions started to be more natural, relying less on the question aids and planning tools. Teacher G felt that there would still be a lot of work before this becomes second nature as a teaching style, again referencing a tendency to give answers, with minimal wait times rather than prompting students with metacognitive questions. This teacher also reflected on how they could improve the experience for EAL students. These reflections could, perhaps lead to a tentative suggestion that previously held deficit models by some were being challenged through this intervention. There were several self-reflective notes about how this could be developed further, such as having desk mats or having

questions around the room to prompt in advance. This was echoed by teacher B who also commented on the need to give more thinking time as well as remembering to frame questions in a metacognitive way rather than relying on lots of cognitive questioning. This teacher also felt that having used such questions in lessons made teacher written feedback more effective as students were already more aware of their learning. Looking forwards, Teacher B wrote about how they might, in future, direct students to develop metacognitive style SMART targets. Teacher F wrote about the challenge of time in the whole task, in that the tasks took longer to complete due to the students working in a metacognitive way and using scaffoldings and structure to work through the answers.

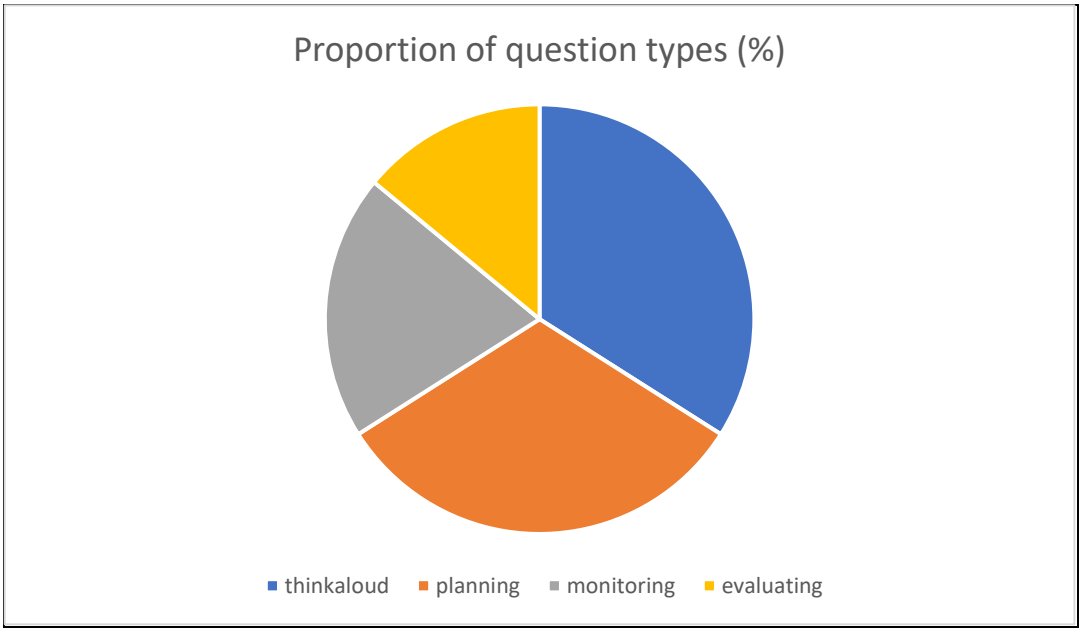
As a further observation, the self-reflective journal had been adapted from the EEF's tool to allow teachers to reflect on professional development (EEF, 2022) which had, itself been adapted from Gibb's reflective cycle (Gibbs, 1988). In this respect, the teachers can be seen to be engaging with Schon's (1983) concept of 'reflection-on-action', as articulated by Farrell, who notes that such reflection is evidence based, with teachers collecting evidence about their work and then reflecting upon the implications of this for their practice (Schon, 1983, referenced in Farrell, 2012, p.15). The use of the journal as a positive developmental tool is something that will be revisited further in the discussion section.

6.2 Peer observations

Inevitably, the extent of peer observations (one per teacher over the session) meant that it was not possible to draw clear conclusions or themes as to the impact of the development of skills over time, and hence the extent of any analysis of the field notes collected is limited. Nevertheless, they were helpful in providing useful contextual background and anecdotal evidence as to how teachers were implementing the strategies that had been introduced in the CPD session, as well as student responses to these. A summary of the completed field notes is shown in Appendix 10.

6.2.1 Proportions of observed metacognitive teacher actions

This first section of the form allowed observers to create a tally of how often they observed different types of metacognitive actions by the teacher. The highest proportion of actions observed was in the initial modelling of the think-aloud routines. This modelling might be considered most similar to a traditional expository style element of a lesson. Once students were introduced to the classroom tasks, the proportions of planning/monitoring/evaluating questions followed the same pattern as evidenced in the self-reflective journals, with more questions devoted to planning, followed by monitoring and then evaluation. The proportions are shown below:



6.2.2 Initial identification of themes from field notes

After the tally section, the observation form allowed for more open-ended field notes to be recorded. Having studied the summary of the notes for all lessons, the following themes could be identified:

a. Use of modelling and scaffolding

All of the lessons observed started with a clear use of modelling of a think-aloud routine. As the first stage in the toolkits discussed in the CPD, it is encouraging that all teachers appeared to be confident in utilising that approach. Teachers were seen to be modelling strategies which mainly focused around examination questions. The strategies appeared to have a consistent theme in terms of using scaffolds or structures to plan responses, and how to extract knowledge from sources to use in those responses. The scaffolds used included using mind maps, the PEEL structure to answering an extended English question, and an eight-step process to solving physics equations. Students were seen to respond positively to the modelling and then

planning questioning, with observers noting that all students seemed to engage with this stage of the metacognitive cycle.

b. Independent self-reflection

The lessons that were observed all had an element of asking students to evaluate their own, and in some cases, each other's work. Although evaluative questions were observed in the smallest proportion, independent self-reflection was observed in that students were given time to consider their work and identify areas for improvement. It is interesting to note the different strategies that teachers used to encourage this self-reflection. For example, in the lower ability English class, a visual element was introduced with students using different coloured pens to record what they now know and what they still need to work on. In physics, completed scaffolded answers were placed around the room and students got up to check their answers and highlight the stage at which they made an error. In MFL, there was a whole class discussion about how peer assessment might support learning from mistakes.

c. Collaborative and peer learning

One theme that emerged from the field notes was the extensive use of peer support and pair/group discussions. This was a feature of the majority of the observed lessons, with the exception being the lower ability English class, in which the students were working on their questions individually. This implies a focus, by the teachers in these observed lessons, on the development of collaborative and social metacognitive skills alongside independent self-regulation. The IBO's approaches to teaching and learning, as previously discussed, has roots in constructivist and social constructivist theories, emphasising the contribution of the "community in which learning takes place" as well as the importance of collaboration in enhancing learning (Bullock, 2011, p.3). All the

teachers undertaking this intervention are also IB teachers within the school, and IB trained, and so it might be expected that this facet of teaching is observed elsewhere within the school.

d. Differential responses

As has been seen in the teachers' own self-reflections, the observers noted differential responses to the metacognitive questioning techniques observed in the lessons. Students were most confident in responding to planning or think-aloud questioning and activities, with the rate of response to monitoring/evaluation style questioning and activities moving from all/most to most/some. This observation might be symptomatic of this type of questioning being the one most often used and therefore the responses being the most rehearsed and fluent. In an MFL lesson, for example, the students were observed to go through the process of self-reflection and regulation, but some were less confident in articulating their evaluation of their work. The level of confidence also varied, for example in the physics lesson, according to the level of observable cognitive challenge. Observers noted that some students needed more scaffolded support in working through the models/strategies than others, and they also observed a differentiated style of support by teachers (and, indeed, peers). As noted in the literature review, however, observed behaviours may not necessarily indicate cognitive variations, particularly if the observation is about articulating a process (as opposed to a cognitive process having occurred). This is evaluated further in the discussion section.

6.3 Post lesson sequence semi-structured discussion

The final aspect of my data collection was a group interview with the teacher participants, held at the start of the summer term. The planned questions are shown in Appendix 3, but as per Denscombe's (2017) guide to conducting a semi-structured interview, I kept questions open-ended such that the discussion could develop according to the participants' shared experience of the intervention (Denscombe, 2017, p.231). This format allowed the resulting transcript to become a data rich source to explore my research questions and I found that this produced the most valuable data from which to further develop the emerging themes. The coded transcript is shown in Appendix 12. Below is a summary of the themes that emerged from the transcript, grouped into three broad subject areas.

a. response to January CPD
    i. benefit of collaboration

All teachers had previous knowledge of metacognition prior to the January CPD, from a variety of circumstances (previous schools, teacher training, previous T&L meetings). There was a general consensus that the CPD was helpful in making the concept clearer as well as giving practical examples of how to apply the concepts. When discussing the CPD session itself, teachers were very positive about the opportunity to collaborate in their subject groups. A set of collaborative tasks had been designed to give teachers an opportunity to develop, within their subject areas, examples of questions within a subject context. For example, Teacher A commented that "you actually started to ask these questions yourself and then think about how you could use them in the classroom". Teacher F commented that "I think the buzz around the room was best when we were all collaborating in our departments… we get so little time to do

that…. to be able to come together and have that discussion…… that's where I saw people really engaging". These comments support the findings of the EEF in its recommendations on effective CPD in terms of giving time for colleagues to discuss strategies within their own contexts (EEF, 2023).

ii. Duration of CPD

Likewise, in terms of the time devoted to CPD, teacher B commented about frustrations of being on a course and "you're really buzzing with all these ideas, but you just never have that thinking time…. So it gave us a little bit of time with that day but….. it's about finding a way of using that INSET which means we are actually dedicating time to it". This highlights a limitation of my intervention design which has already been discussed, in that the EEF recommendation regarding effective CPD about a new pedagogical approach should last at least two terms (Quigley et al., 2021a).

iii. sharing of experiences

It is interesting that, despite the participants being reluctant to be videoed as part of data collection (a methodology that, for ethical reasons, was not used) the teachers, when discussing how they would want to share their learning in a future CPD session with the wider staff body, included suggestions of using video to share their findings with others. Teacher G, for example, said "wouldn't it be nice if we could have filmed one of us doing something that we would be willing to share", with Teacher D adding "somehow it comes alive in a way it doesn't on paper". There was a general consensus that the participants wanted to share their experiences more widely. Teacher A adds "I would have loved to be where we are just us, you know, talking about it, or even going into classrooms and watching it. That's how I learn the most". There was a clear sense that learning had happened and that the participants had a desire to share that

learning with the wider staff body as well as a frustration that they had not yet been able to do so. This echoes the challenge observed by Greany and Maxwell (2017) when researching collaborative R&D in that the impact was far less on those teachers not directly involved due to lacking a deep understanding of, or commitment to the innovation. Interestingly, Greany & Maxwell go on to suggest that the R&D participants might be involved in designing CPD directly for their peers (Greany & Maxwell, 2017, pps. 16-17), which is broadly in line with the suggestions being posited during my own interview.

b. Use of the self-reflection journal

As had already been noted, the use of the self-reflection journal was mixed amongst the teacher participants, with only four of the seven teachers recording their reflections in written form. Teacher D, for example, said "I didn't engage with this booklet as much as I should have done…. It was good to follow the process… but I found it just too scary and too much". Teacher C echoed this "getting to this, for me, that was a big task… but I can see the value for the students and how they've made amazing progress". This echoes the attrition rate of teachers, cited by Muijs and Bokhove, when engaging with overly burdensome CPD resources (Muijs & Bokhove, 2020). Of the teachers who did use the booklet, comments were positive, not just in terms of the process, but also that it allowed an opportunity to reflect on how the students in their classroom were learning. Teacher A felt that "it was a positive experience, and it certainly made me think like a reflective practitioner." This reflects the observation that has already noted about the nature of this reflection being akin to Schon's 'reflection-on-action' as cited by Farrell (Schon (1983) cited in Farrell, 2012). Teacher B, for example, highlighted this when saying "I like the process of having questions to respond to and getting you thinking about your own teaching", although

the same teacher did feel that some of the questions were repetitive and felt the reflective cycle process could have been achieved more efficiently. Teacher E discussed the fact that the reflection highlighted the fact that the EAL learners in the MFL classroom were the experts in terms of learning languages, and that prior to this exercise, they had not been validated as such; "they know how to learn a language, but they hadn't realised until it was sort of laid open that they actually knew how to do it". As an example of adapting teaching in response to the reflective process, Teacher G felt that the method of recording use of questions allowed the opportunity to reflect on their use of wait times; "I'd started to reflect by keeping a record and I realised that I was probably stopping them from using a metacognitive approach because I was jumping in with the answers".

c. Impact on teaching practice

    i. Speed of change

The first aspect of this section asked teachers to consider what they found surprising about applying the metacognitive questioning strategy, with teachers commenting on how quickly students picked up the approach and started to use this in their planning. This view was presented by five of the seven teachers. Teacher A, for example, with lower ability English noted that "they were able to pick it up and run with it quite quickly". This echoes the discussion within the literature review regarding the positive impact of metacognitive instruction on all ability levels. Teacher F said, "I was amazed how quickly it caught on". In elaborating on how this was fostering self-regulation, Teacher G commented that it was "fostering the independence as well as I have some students that have been used to always put their hand up constantly… and I sort of said, you've looked at something like this before, what did you do? And so I'm not answering any questions….. I do feel like I'm getting fewer questions, you know,

there's a pause before they're asking those questions. There was a discussion, however, as to the limited nature of this intervention, with this being a "small experiment" (Teacher D). Furthermore, Teacher G raised the limitation of a lack of a 'control group' or, indeed, whether the students would take those strategies and apply them in lessons which were not part of this intervention. These were valid evaluative comments which highlight the limitations of any firm conclusions to be drawn from this intervention.

ii. Subject specific context

It has already been noted that metacognitive instruction is most effective when applied in a subject specific context. Teachers went on to discuss how they applied the generic model in their individual subjects. In English, for example, the teachers agreed that it was useful in discussing how to approach comprehension questions, with teacher B noting "it does fit well to writing tasks where it's often down to interpretation". The physics teacher (Teacher F) went on to elaborate on the process of adapting the former way of teaching in a topic focused way into a broader strategic approach which could be applied in multiple scientific contexts "this has put some words into what I've been doing all along… I'm sort of fascinated to see when I'm going to my next topic how this will happen again". This concept was taken up by Teacher E (MFL teacher) "it is really helpful for the kids to say, this is your strategy" and using the right language. Teacher G also felt that it became "easier and more natural" to spot opportunities to teach metacognitive strategies (in this case how to do effective research when teaching the Yar and Potsdam conferences).

iii. Differentials based on stage of metacognitive cycle

Teachers felt that the planning stage of the cycle was approached with more confidence than the evaluation stage. Teacher A explained that the lower ability students in the class "sometimes they struggle with finding the right language to explain how they feel about their work" although they had confidence in responding to the planning process "they definitely responded to that, we have seen this before, what does this look like? They like spotting those patterns".

This view was echoed by other teachers who felt that the preparation stages of a task was the most successfully delivered, for example Teacher F saying, "the planning was the most successful of the three, and it is about getting them into the habit of stopping and thinking rather than going on automatically". However, there was also discussion about how the monitoring and evaluation stages manifested, with Teacher G talking about their assessment and having "a little bit of a checklist, you know, have you read through, have you made sure you've included information, did you follow the structure?"

iv. Differentials based on student demographics

An interesting discussion emerged about differentials based on ability. Teacher F (physics) felt that higher ability students did not engage so well with the process; "they thought they could do the task, they didn't think they need to plan 'I don't need to monitor, I can just do it'". This was related to the subject material, perhaps "most of the tasks we did are quite closed… do a calculation, once you've got the answer that's it….. the higher ability students, from their point of view, were asking 'why would I do it'?". Likewise, in MFL, Teacher E noted "for the more able students we are wanting them to internalise this process rather than just speak, or write, or read and it is often more difficult for them too take that step back and think, well actually how did I do

it?". Teacher A, who teaches the lower ability English class, carried the theme on, by giving a possible explanation for that differential, referencing the students in this group; "they have probably had failure before, so they know they need to improve". Teacher C felt "it was good, especially for those who need chunking and scaffolding. It worked well with those kinds of needs". In contrast, Teacher B, who teaches the higher ability English class, did feel that these students responded well to the strategy and were able to articulate their evaluation well; "they were very positive and they were able to answer, in great detail, reasons why they had done certain things", whereas "some of the weaker ones perhaps couldn't always see where the mistake was or what they'd not done or needed to do." It appears, therefore, that the relationship between ability and responsiveness to metacognitive instruction is not a consistent one. Teacher E, for example, noted that "there's a mixture of abilities, but quite a strong set overall and they were all quite positive and wanted to reflect. I would say the more able were able to better articulate their ideas". This then became linked with the discussion of EAL learners in the classroom, with Teacher D noting that "I wondered if it was just the students with the more confident use of English language who were happier with it".

v. Perceptions of changes in self-regulation

In terms of whether teachers' overall perceptions of an improvement in self-regulation had been achieved, there was a positive response from five of the seven teachers who expressed a view albeit with caveats, such as Teacher G; "most of them, and with specific tasks". Teacher F summarised the general consensus, recognising that "if I asked them about whether they feel differently now, they would probably say yes, if but I just left them to it for another week they would give a different answer". Teacher A echoed this view saying it is "definitely taking steps in the right direction….. it will

take constant reinforcement and across the board". This was felt to be particularly the case with the lower ability students; "it's just because of the ability and make-up of my class and memory difficulties". Teacher G also reflected on the beneficial effect of students working together in this way "if most of the class can move in that direction, it maybe encourages the others too", as well as reflecting on the social element of learning "it gave Student A the opportunity to have the conversation with Student B about sources and being more discerning, and I think it works better in that way".

7.0 Discussion

This section aims to evaluate the themes that have emerged from the findings above, and to consider their role in answering the previously stated research questions:

a. What factors might impact the extent to which teachers use metacognitive questioning techniques in their classrooms?
b. What factors might impact the extent to which the students in those classrooms respond to metacognitive questioning?
c. How do teachers perceive the extent to which questioning to support metacognitive self-reflection impacts upon the level of metacognitive regulation in their students?

7.1 What factors might impact the extent to which teachers use metacognitive questioning techniques in their classrooms?

From the findings gathered, the extent to which teachers used the metacognitive questioning techniques which had been introduced in the January CPD session can be examined from two perspectives:

a. the efficacy of the CPD training in enabling teachers to confidently implement the strategies.
b. classroom based factors which might impact the extent to which the metacognitive questioning techniques were used.

Perspective 1: Efficacy of CPD training

The aspects of the CPD which appeared to have greatest effect in facilitating teacher use of the techniques were those which involved collaborative work and practical examples of how such techniques might be used in practice. This echoes Hargreaves

(2019) in considering the importance of a collaborative culture, as well as valuing the experience and expertise of all colleagues. Teachers most enjoyed the opportunity working collaboratively with their colleagues in subject groups to develop subject-specific questions or examples. This aspect of the CPD appeared to have had a positive impact on teachers going on to adopt the intervention strategy in their classroom. An interesting observation about collaboration emerged in the semi-structured interview when discussing the possibilities of video recording of activities. It was notable that the perception of the use of video recording changed fundamentally when it was discussed as a collaborative CPD tool, rather than a data gathering tool, having been a method that I had rejected from an ethical perspective when it was initially proposed as a means of recording findings. When considered as a way of sharing good practice, teachers were genuinely excited by the prospect of being able to share their own learning with others in the organisation using video as a tool. This may, therefore, be a suitable method to adopt when considering how this intervention can be further embedded in the organisation.

In terms of the limitations of the CPD design in enabling teachers to implement metacognitive questioning in their classrooms, two observations can made. Firstly, as the teachers in my own intervention noted, it is important that teachers do not feel overwhelmed by the prospect of introducing what might be perceived to be a 'new' or 'different' strategy. Although the teachers did respond positively to the intervention itself, the degree to which they felt able to engage with formalised reflection processes echoes Muijs and Bokhove in that the process should not be seen as something 'new' or 'different' and also that the process itself should not become overly burdensome (Muijs & Bokhove, 2020). Furthermore, time constraints within the INSET schedule meant that the content of the CPD session was limited in the actual content covered.

Importantly, this also meant that, whilst the January CPD presentation did make connections between the metacognitive cycle as described by the EEF, and the Ignatian pedagogical paradigm as well as the IBO's own reflective cycle, the subject group tasks, and the training resources subsequent self-reflection journals concentrated solely on the EEF planning/monitoring/evaluation toolkit in order to focus discussions and reflections. In terms of the focus of the school's stated aim i.e. the development of the teacher as Ignatian educator, it could be argued that this would limit the extent to which the language of the Ignatian pedagogical approach is used in the intervention itself. Certainly, when reviewing the data set as a whole, Ignatian vocabulary is not immediately apparent (with the notable exception of reflection, which is a common term running through the EEF/IBO and IPP frameworks). This, perhaps, mirrors the disconnect observed by Nowacek and Mountin (2023) and Hayes (2006) between discussions of Jesuit education and inquiries into student learning itself. It also presents an opportunity to consider how a more widespread use of a shared language to articulate metacognition which is reflective of that Ignatian tradition into the future development of this project.

Furthermore, having sufficient time for teachers to revisit and refine their proficiency in the strategy was seen, by the teachers undertaking the intervention, to be a limiting factor in allowing the full potential of the intervention to be manifested. From the teacher contributions in the semi-structured interview, there appeared to be a sense of frustration in only having limited time to work together, either in the CPD itself, or in subsequent department discussions. Thus, the extent to which Muijs et al's (2014) knowledge building cycle has been implemented could be questioned and this could, therefore, be a limiting factor in the teacher use of metacognitive questioning within this intervention. The peer observations did indicate that there was a widespread use

of metacognitive questioning techniques, with clear use of modelling of think-aloud routines in all lessons, and this was substantiated by the teachers' own records in the self-reflection journals. Nevertheless, the extent to which this would be maintained post-intervention without regular revisiting and consolidation of the strategies is debatable and presents a further opportunity for the future development of the project.

Perspective two: Classroom based factors

a. type of task

The semi-structured interview identified that teachers felt that metacognitive questioning lent itself to some types of tasks/activities more than others, reflecting the literature in that subject context may be a relevant factor in determining the degree to which metacognitive questioning leads to student self-regulation. The teacher discussions perhaps echoed the findings of Dent and Koenka (2016) in that, to an extent this distinction might be a function of teacher beliefs. Certainly, it was interesting to hear the physics teacher, having first expressed concern as to the 'nature of the tasks' that they tend to do being a limiting factor in being able to 'do' metacognition, then realising that the techniques did allow the creation of generalisable strategies which could be applied in multiple topics.

b. Preference for direct vs indirect approach

The greatest proportion of questions, as recorded in both peer observations as well as the self-reporting journals, were of the planning type, and this might be regarded as being most similar to the more usual teacher exposition style questioning in setting up activities. The peer observation notes indicate a fairly consistent pattern of approach within this planning framework, with the use of scaffolds or structures to plan

responses. This would seem to indicate, with reference to Muijs and Bokhove (2020), that the direct approach i.e. explicit instruction and implicit modelling, was more favoured rather than an indirect approach based on guided enquiry. An explanation for this could be because, as Muijs and Bokhove (2020) further observe, there is a requirement for students to have an awareness of their own self-regulatory and metacognitive skills and, as has already been noted, this is a concept which is not well-developed in the student cohort involved in my intervention.

7.2 What factors might impact the extent to which the students in those classrooms respond to metacognitive questioning?

The themes that emerged from the three data sources can be identified as follows:

a. Perceptions of ability

Although all teachers self-reported positive engagement with the intervention from students, and indeed this was borne out by the peer observations. However, the self-reporting journals appear to indicate that the nature of student responses to the metacognitive questioning strategy was variable. Furthermore, the nature of that variation was not consistent. Teacher comments in their journals referenced ability levels as a possible causality for this variation. This would appear to be at odds with the previous literature such as Donker et al.'s (2014) meta-analysis which suggests that there were no significant differences in ability levels. The findings from teacher responses indicate that they felt that this variation may have been due to the nature of the lesson itself, in terms of subject or task. For example, in English and history, the teachers felt that the lower ability students found it more difficult to articulate their responses. This contrasts with the view of the physics teacher, in a lesson which had more discrete calculation type content, it was the higher ability students who were

less willing to spend time on responding to questions about their metacognitive strategy approach because they did not see the need to do so. Furthermore, the history teacher felt that the SEND students in the classroom were particularly keen to engage with metacognitive prompts, coming up with lots of responses. Whilst noting that this variability was observed, within the constraints of my intervention, it is, of course, impossible to attribute a definitive cause to the perceived variation. For example, there could be motivational differences based on preferences for individual teachers or subjects, as noted by Zimmerman and Kitsantas (2005) or indeed the nature of the task may preclude self-regulated learning, as per Dent and Koenka (2016). However, an important limiting factor in the ability to draw any conclusion about the stated findings is the potential for misattribution/misconception of student responses to the questioning. As discussed in the literature review, Harris (2011), for example, in examining secondary teachers' conceptions of student engagement found that teachers had a tendency to observe behavioural rather than cognitive factors when reporting levels of engagement, and this may be the case in my own data. As the teachers involved in the research (either as peer observers or participants) had only received limited CPD on metacognition as well as limited training (in the case of the peer observers) in qualitative data collection and this could have played a part in the fact that the more immediate behavioural observations were the ones that were recorded.

b. Other demographic factors

As discussed within the literature review, Pat-El et. al (2012) found little variation in student receptiveness to metacognitive approaches when studying groups with varying cultural differences. In contrast, my findings indicate that some of the teachers felt that there was some variation in the ability of students to articulate their responses to

metacognitive questioning based on the level of language proficiency. This does not, of course, imply that those students did not engage with the metacognitive process, and teacher recordings of the nature of the articulated response are not, of course, necessarily an indication of variation in the process itself. Indeed, it may be helpful to consider Harris and Williams' (2012) discussion of socio-economic differences in cultural capital/cultural resource and the impact on responses which might be 'valued' by the teacher. Although socio-economic differentials are less relevant to my own context, differences in previously acquired cultural capital may well impact on the teacher perspectives as to the success (or not) of the metacognitive questioning techniques. Nevertheless, because this was an observation made in both the self-reporting journals as well as in the peer observation process, it is a potential factor to be considered in the future development of the project, when deciding how to introduce or guide students through the metacognitive process.

c. Level of collaboration

Teachers appeared to use peer support and collaborative learning in their classrooms to support the delivery of the metacognitive strategies. This can be considered an enabling factor, therefore, in allowing students to respond to the metacognitive intervention. The majority of lessons observed in the peer observation had a feature of collaboration, and as noted previously, this echoes the collaborative approach emphasised by the IBO's approaches to teaching and learning with Bullock (2011) noting the contribution of collaboration in enhancing learning. This collaborative approach was expanded in the semi-structured interview when teachers spoke of encouraging students to support each other in their learning and using that support as a means to extend their own articulation of the learning process, echoing the

effectiveness of King's (1991) study of students using pair work to as a way of solving problems strategically.

d. stage of metacognitive cycle

A common theme which emerged from all three data sources was the notion that students were most confident in responding to the planning and monitoring questions but were less articulate in explaining their process after task completion (although the nuance of a distinction between cognitive development and articulation of that development remains). It is noted in the literature that there is a distinction to be made between metacognitive awareness, and the requirement for affective self-reaction as part of self-regulation within an academic context (Dinsmore et al., 2008, Mannion et al., 2008, Mannion & McAllister, 2020). There is, perhaps, a greater degree of challenge required in terms of metacognitive skills development for students to move from being metacognitively aware to being self-regulated learners. To an extent, therefore, this might not be unexpected, as even though teachers had previous knowledge and awareness of metacognition, it was not something that, at this stage, had been introduced explicitly to the students. Equally, as the document by the IBO (2015) in their guidance on the impact of the level of teacher guidance on student learning, the peer observation field notes and self-reporting appears to indicate that teachers are following the 'shared teacher regulation' model which is recommended as the means to best develop student self-regulation. In evaluating this point, when reviewing the raw peer observation field notes, self-reflective journals and indeed the contributions to the semi-structured interview, there is a significant degree of 'looseness' around the application of the terms self-regulation and metacognition. Significantly, the lack of rigour in applying the terminology means that conclusions surrounding the degree to which the development of teachers' skills has led to an

increase in metacognitive self-regulation are limited. Nevertheless, in terms of drawing any conclusions the observation about a tiered level of confidence in response to the differing types of metacognitive questions is an important one.

7.3 How do teachers perceive the extent to which questioning to support metacognitive self-reflection impacts upon the level of metacognitive regulation in their students?

Before analysing the response to this question, it is worth emphasising that this is not an attempt to quantifiably measure any change in metacognitive regulation amongst the student group. As has been previously noted, the limited scale and timeframe of the intervention would render any such conclusion meaningless. Instead, as the focus of the intervention has been the teacher rather than the student, this question aims to explore whether teachers perceive such changes as a result of changes in their own pedagogical practice. In all three data sources, there was a sense that an improvement in self-regulation had been achieved. It was also felt that this change in behaviour took place surprisingly quickly, with teachers noting this speed of change both in their own self-reflections and then in discussion in the group interview. In terms of self-regulation specifically, Schunk and Zimmerman's (1998) cycle of self-reflection and then forethought appeared to be observed by the teachers who felt that that some students, who might have immediately asked a question when starting an assessment, instead were prepared to think about where they might have seen such a question previously and applying that strategy. Likewise, the peer observation field notes recorded a variety of ways in which this independent monitoring and self-reflection was being fostered by teachers, such as using different coloured pens in English, or placing corrected responses around the room in physics. This was noted with caveats, however, notably about the fact that this had only been seen in discrete tasks, and,

importantly, that such self-regulation would need to be consistently reinforced for any long-term effect to be seen.

8.0 Conclusion and evaluation

Before drawing overall conclusions from this practitioner research, it is useful to evaluate the relative contribution of each element in supporting those conclusions. The semi-structured interview produced a data rich environment, and these coded field notes emerged as the main data set from which it was possible to deduce the main themes arising from the intervention. The peer observations, although useful in providing context and examples to illustrate points, were too limited in nature. The reasons for the limited number of observations were, firstly, the time constraints of the intervention itself but secondly, from an ethical perspective, I was conscious of the need to be mindful of colleagues' own time constraints in fitting in observations around a full teaching load. The self-reflection journals were useful in providing insight into the teacher perspectives on the use and efficacy of the metacognitive techniques that they were using, as a 'lived experience'. However, there was another important, and unanticipated benefit of the self-reflection journal in that not only did it allow the collection of data, but it also served as a vehicle from which teachers themselves recognised the benefit of self-reflection and took on the role of being a reflective practitioner, an essential element of teacher efficacy. Nonetheless, it is noted that not all teachers felt able to complete the self-reflection journal, again due to time constraints. From an ethical perspective, I was aware that the power dynamics (in terms of my position within the organisation relative to the participant teachers) may have made those teachers feel uncomfortable or concerned by not having completed this aspect of the intervention. I made every effort to reassure those teachers that this did not devalue their contribution to the intervention. This discomfort may still have remained for those colleagues, however, and I remained conscious of that ethical

responsibility in supporting teachers through the intervention and also as I developed my conclusions.

In concluding the extent to which the development of teacher skills in metacognitive questioning does have an impact of metacognitive regulation in the classroom, the overall response, having considered my findings, would be positive. However, the findings also signpost several clearly made limitations to this positive conclusion, which inform the implications and future developments from the project.

9.0 Implications for future development

It is clear, from the comments of the participating teachers, that it will be important for my school to continue to invest in CPD which addresses the requirement for subject-specific resources and training, as well as continually revisiting the basic tenets of the metacognitive cycle. As Quigley et al. (2021) note, schools need to support teachers to develop and then apply their knowledge of metacognitive strategies, with time and high-quality resources being prioritised. In terms of my own role, specifically, Quigley et al. further note that support from senior leadership is key to ensuring that this happens effectively (Quigley et al., 2021, p.26). As first steps to address that imperative, I have worked with the Director of T&L to deliver two more CPD sessions (Easter and September 2024) aimed at consolidating knowledge of the strategies that had been introduced in the January CPD. We have also developed a range of departmental classroom resources which have subject specific prompts (which had been suggested by departments as part of the table tasks at Easter CPD).

Importantly, from the qualitative data gathered from the teachers who participated in the study, it appears that there have been wider benefits from the intervention in terms of building teacher efficacy from the self-reflective nature of the data collection. One of the most striking observations to be made, albeit not directly about impact on students from the teacher skills development, has been that the process of data collection itself has been an opportunity for the participating teachers to engage with the teacher enquiry and knowledge building cycle as developed by Muijs et al (Muijs et al., 2014, p.247). Amongst those teachers who completed the self-reflection journal there was a genuine engagement with the self-reflection in the comments noted as well as teacher comments about further pedagogical development, akin to the

evidence-based approach to teacher reflection leading to improvement in practice as mooted by Farrell (2012) and Greany and Maxwell (2017). Thus, it can be argued that this intervention has allowed the development of a level of collective teacher efficacy, as discussed by Donohoo et al. (2018) in allowing those teachers to see how collecting evidence can fit into a routine and from which evidence they can make adjustments to their practice. This would address the recommendation of Stoll and Kools (2017) in their discussion of the importance of creating learning opportunities for staff, in that they highlight the need for educators to take control of their own learning and become self-regulatory learners themselves, which has genuine synergy with teacher efficacy (Stoll & Kools, 2017, p.8).

Nevertheless, this benefit is caveated by the observation by Greany and Maxwell (2017) that dissemination from the core project team is essential to fully reap the benefits of that research. I have already highlighted the fact that the group of participating teachers is something of a 'self-selecting' group, predisposed to engaging positively with the intervention and research process. However, in the semi-structured interview, the discussion about the CPD design, and the potential for sharing experiences echoed the collaborative nature of the research process itself, and those teachers were keen to share their experiences more widely. Donohoo et al. (2018) emphasise the importance of teachers hearing about 'what works' as well as the role of leadership in creating opportunities for frequent collaboration within an environment of trust. In terms of future development from this project, therefore, capturing the enthusiasm within the group to share their findings in a timely manner as part of a future CPD will be essential to fully reap the benefits from this learning such that their own teacher efficacy can be brought into a whole school setting. Donohoo et al. also recognise the central role of the school leadership in building a

culture designed to increase teacher efficacy, emphasising student achievement and a commitment to learning in the school narrative (Donohoo et al., 2018, p.44). In terms of my own contribution to this goal, therefore, it has already been noted that the IBO recommends encouraging teachers to engage in action research to not only provide effective CPD but also to have a positive impact on student learning (IBO, 2015). Considering Nowacek and Mountin's (2023) observation as to the paucity of research regarding the efficacy of Jesuit methodologies in the classroom, it would appear that there is an opportunity for me to encourage colleagues to engage in further research into the use of metacognitive questioning techniques strategies in a Jesuit school, thus further building a professional learning community.

Stoll and Kools (2017) emphasise that any learning organisation should have a clear moral purpose to make a difference to all student lives and which addresses all student needs. The mission of my school is aligned with this in terms of our stated aim to develop all of our students' "full human potential" (School A, 2022, p.3). Thus, this practitioner research project intervention can be seen as a starting point only from which the whole school approach to the development of metacognitive regulation, as part of a wider suite of study skills, can build. There is an opportunity to support that skills development through a shared language of learning which enables our teachers and students to fully understand what it means to be a self-regulated learner. Explicitly encouraging the use of the Ignatian pedagogical paradigm as a metacognitive framework will, therefore, enable my school to further pursue its long-term strategic aim of developing a more overtly Ignatian approach to pedagogy (School A, 2022).

Appendix 1: CUREC approval: EDUC_C1A_23_350

SOCIAL SCIENCES & HUMANITIES
INTERDIVISIONAL RESEARCH ETHICS COMMITTEE
DEPARTMENTAL RESEARCH ETHICS COMMITTEE

Department of Education
15 Norham Gardens, Oxford OX2 6PY
student.curec@education.ox.ac.uk; staff.curec@education.ox.ac.uk

[redacted]

Department of Education, Social Sciences Division
University of Oxford

12 December 2023

Dear [redacted]

Research ethics approval

Research title: Thinking aloud: An exploration of the impact of developing teachers' metacognitive questioning skills on metacognitive regulation in the classroom.

Research ethics reference: EDUC_C1A_23_350

The above application has been considered on behalf of the Education Departmental Research Ethics Committee (DREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the DREC, ethics approval has now been granted for this study.

Please note the following:

Personal data: It is the responsibility of the PI to ensure that all personal data collected during the project is managed in accordance with the University's guidance and legal requirements.

In-person activities: Any data collection involving in-person interactions with participants must have an up-to-date fieldwork risk assessment in place; further guidance is available from the Safety Office's website.

Amendments: Please notify the committee if you intend to make any amendments to the information in your ethics application as submitted at date of this approval, as all changes must receive ethical approval prior to implementation. The amendment form is available on the SSH IDREC webpage.

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to staff.curec@education.ox.ac.uk / student.curec@education.ox.ac.uk or ethics@socsci.ox.ac.uk.

Yours sincerely,

DREC Dr Jenny A. Wynn

cc: Lesley Nelson-Addy

Appendix 2: AP15 teacher information sheet

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www.education.ox.ac.uk

Director Professor Victoria Murphy

[redacted]

Thinking aloud: An exploration of the impact of developing teachers' metacognitive questioning skills on metacognitive regulation in the classroom

INFORMATION SHEET FOR TEACHERS

Ethics Approval Reference: EDUC_C1A_23_350

I am writing formally to you with regard to research that I am undertaking as part of my Master's degree in Learning and Teaching at the University of Oxford. [redacted] has agreed to take part in an evaluation of an intervention focused on the concept of metacognitive self-reflection and its role in developing self-regulated learners. This forms part of our longer term [redacted] Learner' project. I would like to invite you to be part of this study. I very much hope you would like to take part, but before you decide, it is important that you understand why the study is being done and what it will involve.

What are we trying to find out?

The purpose of this intervention is to develop teacher efficacy in promoting metacognitive self-reflection in our pupils, through the teachers' application of CPD on the use of metacognitive questioning and modelling techniques. I hope that my research allows me to establish the extent to which such skills development has an impact on the learners in the classroom, with my findings contributing to our long-term aim of developing a whole-school study skills programme within our Jesuit context.

Why have you been invited to take part?

I am inviting you to take part because you are a teacher of [redacted] year 9) pupils. As the first year group of entry in [redacted] this year group has been selected as being the most appropriate initial focus year group for our wider study skills programme.

Do I have to take part?

No. You can ask questions about the study before deciding whether or not to participate. If you do agree to participation, you may withdraw yourself and your data from the study at any time, without giving a reason and without penalty, by advising me of this decision.

What will happen if I take part?

This research will take place during the Easter term and will take place over no more than six weeks. I will be gathering quantitative data through structured lesson observations conducted by me or another teacher

in your department, resulting in hard copy field notes. I will also use a video recording of those lessons to support more effective observation of teacher and pupil behaviours. These videos will be deleted once thematic coding of behaviours has been completed to produce hard copy field notes. I will also be asking you, as a teacher participant, to complete a structured diary so that you can self- reflect on the impact of your use of metacognitive questioning.
Finally, I will conduct two small group semi-structured interviews with teachers to elicit qualitative understanding about the relationship between metacognitive questioning and teacher perceptions of self-regulation in pupils. Field notes of these will be taken, and they will not be audio- or video-recorded.
No personal data will be recorded. Paper copies of all field notes and the diaries will be scanned and stored on Onedrive for Business. Paper copies will then be shredded.

What are the advantages / disadvantages of taking part?
There is no intended personal benefit, or risk to you of taking part in this study.

What happens to the data provided? [1]
The information you provide during the study is the **research data**. Any research data from which you can be identified is known as **personal data**. No personal data is being collected in this study except for whether you have given your permission to take part.
Consent forms will be retained by the school for the duration of the study, and for as long as the school determines appropriate after research activities have concluded at the school.

Other research data will be stored for 3 years after the submission of the research to the University of Oxford by the supervisor of this research.

My supervisor and I will have access to the research data. Responsible members of the University of Oxford may be given access to data for monitoring and/or audit of the research.

Will the research be published?

The research will be written up as a student's assignment. This assignment will not be published.

Who is conducting this research?
The research project is organised by [redacted] of Oxford University, who is studying for a Master's degree in Learning and Teaching. This study has been reviewed by, and received ethics clearance through, the University of Oxford's Central University Research Ethics Committee,

What if there is a problem?
If you have a concern about any aspect of this study, please contact [redacted] or [redacted] and we will do our best to answer your query. I/we will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

[1] Please refer to CUREC's Best Practice Guidance on Data Collection and Management (BPG 09)

Chair, **Social Sciences & Humanities Inter-Divisional Research Ethics Committee**; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

Data Protection

The University of Oxford is the data controller with respect to your child's personal data and, as such, will determine how your child's personal data is used in the study.

The University will process your child's personal data for the purpose of the research outlined above. Research is a task that we perform in the public interest.

Further information about your rights with respect to your child's personal data is available from https://compliance.web.ox.ac.uk/individual-rights.

What should I do next?

Please review the information above, and then complete the consent form for teachers, by Sunday 14th January 2024.

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact either [redacted] (my supervisor) on the emails listed above.

With warm regards,

[redacted]

Appendix 3: AP15 11-15 years Pupil Information Sheet

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Director Professor Victoria Murphy

[redacted]

Thinking aloud: An exploration of the impact of developing teachers' metacognitive questioning skills on metacognitive regulation in the classroom

INFORMATION SHEET FOR STUDENTS AGED 11 TO 15 YEARS

Research ethics reference: EDUC_C1A_23_350

I am writing to invite you to join in a research study. As part of my role here at [redacted], I am studying for a Master's degree in Learning and Teaching at the University of Oxford. I am doing some research with a number of [redacted] teachers, and would like you, together with the rest of your class, to join in this research. This is focussed on the lesson, but not on individual pupils.

Before you decide if you would like to join in, it is important to understand what the research is about, why we are doing it and what it would involve for you. Please read and think about this leaflet carefully.

I have also written to your parents/guardians to tell them about this research and think about whether you want to be included. Please talk to them about what you would like to do. If you would rather not take part they have an 'opt-out form' to let me know. You do not need to tell me yourself.

Why are we doing this research?

The purpose of this research is to observe how your teachers can help you to think about how you learn. Your teachers have been taking part in training about techniques to support that thinking, and so the research is to study how your teachers use those skills in your classes. I hope that my research will help [redacted]'s long-term aim of developing study skills in the whole school.

Why have I been invited to take part?

You have been invited to take part because you are in the [redacted] class of one of the teachers who are involved in the research. As the first year in [redacted] this is the year group selected that we are using as the starting point for our wider study skills programme. All pupils in your class are invited to be involved in this research.

Do I have to take part?

No - It is up to you to decide if you want to take part in this study. You are free to stop taking part at any time during the research without giving a reason by telling your teacher, the researcher or your parent/guardian. You do not have to say why, and this will not affect your education.
If you decide to stop, no one will be upset with you.
If you do not wish to join in, the research will still take place, but you will be seated where you cannot be observed and no details of your role in the class will be recorded.

What will happen if I take part in the research?

I, or another teacher, will be sitting at the back of the class for one or more of your lessons during the second half of the Easter term 2023. Your teacher will deliver the lesson as normal, and you do not need to do anything different. The activity that is going on in the lesson is what we are looking at, rather than individual pupils, and I, or the other teacher will be listening to and watching what goes on in the classroom. We may video record the lesson to help with taking notes, again focusing on the lesson activity rather than individual pupils. Any notes made will be scanned onto OneDrive. The paper notes will then be shredded, and the video recording deleted.

What are the possible disadvantages and risks in taking part?

There are no reasonably foreseeable disadvantages or risks to taking part. You will not be identifiable in the data and any reference to pupil interactions will be anonymised.

Are there any benefits in taking part?

There will be no direct or personal benefit to you from taking part in this research.

What information will be collected and what happens to the results of the research?

Results are kept strictly confidential, and only the people doing the research, or helping with the research, can look at the data. Only a number will be used to identify you, and all information and results will be stored as scanned copies in Onedrive for Business, operated by the University. Paper copies of field notes will be shredded. I will change the names of your school, teacher, and all the pupils when I write about my research. No one will know that you have taken part unless you tell them yourself.

The findings from the research will be written up in a submission for academic assessment.

If I want to use the information for anything else, I will ask your permission. At the end of my research, I will be writing up and sharing with the school about what I found out in my research. You are welcome to read this if you are interested.

All research data and records will be stored for 3 years after publication or public release of the work of the research. Third parties may be given access to research data for monitoring and/or audit of the research, or for data storage purposes.

Data Protection

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the research.

The University will process your personal data for the purpose of the research outlined above. Research is a task that we perform in the public interest.

Further information about your rights with respect to your personal data is available from https://compliance.web.ox.ac.uk/individual-rights.

What do I do now?

Please talk to your parents, guardians and/or teacher to help you decide whether you are happy to take part.

What if I don't want to take part in the research anymore?

Just tell your parent/guardian that you don't want to take part. They will then let me know. You don't have to give a reason, and no one will be annoyed with you. It is YOUR choice.

Who is supervising the research?

My supervisor is Lesley Nelson-Addy (Lesley.nelson-addy@education.ox.ac.uk)

Who has reviewed the research?

This research has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: EDUC_C1A_23_350).

What if there is a problem or something goes wrong?

Please tell us if you are worried about any part of this research, by contacting me [redacted] You may also talk to your teacher/parent/guardian who will let the researcher know. If you are still unhappy or wish to make a complaint, either you or your teacher/parent/guardian can contact the chair of the Research Ethics Committee at the University of Oxford:

Chair, **Social Sciences & Humanities Interdivisional Research Ethics Committee**; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB

Thank you for reading – please ask me any questions.

Appendix 4: AP15 Parent/Guardian information sheet

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www.education.ox.ac.uk

Director Professor Victoria Murphy

[redacted]

Thinking aloud: An exploration of the impact of developing teachers' metacognitive questioning skills on metacognitive regulation in the classroom

INFORMATION SHEET FOR PARENTS / GUARDIANS

Central University Research Ethics Committee Approval Reference: EDUC_C1A_23_350

I am writing to you as I am currently undertaking a Master's degree in teaching and learning at the University of Oxford, and as part of this, [redacted] has agreed to all me to undertake an evaluation of an intervention focused on the how pupils reflect upon how they learn (otherwise known as the concept of metacognitive self-reflection) and its role in developing self-regulated learners. This forms part of our longer term [redacted] Learner' project. We would like to invite your child, along with the rest of their [redacted] class, to be involved in this research. This research is focussed on the activities in the lesson, not individual pupils. We very much hope you would like your child to be involved, but before you decide, it is important that you understand why the research is being done and what is will involve.

Why is this research being conducted?

The purpose of this research is to support teachers in applying training in the use of questioning and modelling techniques which are designed to promote metacognitive self-reflection in our pupils, and to consider the teachers' evaluation of the impact of such techniques. I hope that this research will allow me to establish the extent to which such skills development has an impact on the learners in the classroom, with my findings contributing to our long-term aim of developing a whole-school study skills programme (the [redacted] Learner') within our Jesuit context.

Why has my child been invited to be involved in this research?

We are inviting your child because they are in a [redacted] class. Teachers of this year group have been selected to participate in this research as [redacted] is the appropriate initial focus year for our wider study skills programme. All pupils in their class are invited to be involved in this research.

Does my child have to be involved?

No. You can ask questions about the research before deciding whether to allow your child to be involved. If you do agree to their involvement, you may withdraw your child at any time, without giving a reason and without any effect on their education, by advising the school or researchers of this decision

If your child is not involved in the research, they will be placed where they cannot be observed or recorded and their activities in lessons will not be noted or referred to in any part of the research.

What will my child be asked to do?

I, or one of my colleagues, will be sitting at the back of the class for one of your child's [redacted]essons during the Easter term 2024. Their teacher will deliver the lesson as normal, and your child does not need to do anything different. The activity that is going on in the lesson is the focus of the research, rather than individual pupils, and I will be listening to and watching what goes on in the classroom. I will also video record the lesson, again focusing on the lesson activity rather than individual pupils. I will make field notes, which will then be scanned onto OneDrive. The paper notes will then be shredded and the video recording deleted.

What are the possible disadvantages and risks in taking part?

There are no reasonably foreseeable disadvantages or risks to taking part. Your child will not be identifiable in the data and any reference to pupil interactions will be anonymised.

Are there any benefits in taking part?

There will be no direct or personal benefit to your child from taking part in this research.

What information will be collected and why is the collection of this information relevant for achieving the research objectives?

Results are kept strictly confidential, and only the people doing the research, or helping with the research, can look at the data. Only a number will be used to identify your child, and all information and results will be stored as scanned copies in Onedrive for Business, operated by the University, Paper copies of field notes will be shredded. I will change the names of your school, teacher, and all the students when I write about my research. No one will know that you have taken part unless you tell them yourself.
The findings from the research will be written up in a submission for academic assessment.

All research data and records will be stored for 3 years after publication or public release of the work of the research. Third parties may be given access to research data for monitoring and/or audit of the research, or for data storage purposes.

The researchers will retain Consent forms for 3 years after publication of the work of the research.

Will the research be published? Could my child be identified from any publications or other research outputs?

The findings from the research will be written up in a submission for academic assessment. It will not be possible to identify your child in this submission, as all student interactions will be anonymised.

Data Protection

The University of Oxford is the data controller with respect to your child's personal data, and as such will determine how your child's personal data is used in the research.

The University will process your child's personal data for the purpose of the research outlined above. Research is a task that we perform in the public interest.

Further information about your rights with respect to your child's personal data is available from https://compliance.web.ox.ac.uk/individual-rights.

Who has reviewed this research?

This research has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: EDUC_C1A_23_350.

Who is supervising the research?

My supervisor is [redacted]

Who do I contact if I have a concern about the research, or I wish to complain?

If you have a concern about any aspect of this research, please contact [redacted] on [redacted] or my supervisor, [redacted] and we will do our best to answer your query. I/we will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

Chair, **Social Sciences & Humanities Inter-Divisional Research Ethics Committee**; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB

What should I do next?

Please fill in the enclosed form and return it to me, by email, on [redacted] if you would NOT like your child to take part in this research. If I do not receive the form by Friday 9th ~~February~~ then I will assume that you are happy for your child to take part in this research. Please remember that you may withdraw your child at any time, without affecting their education and without giving a reason, by notifying the researcher.

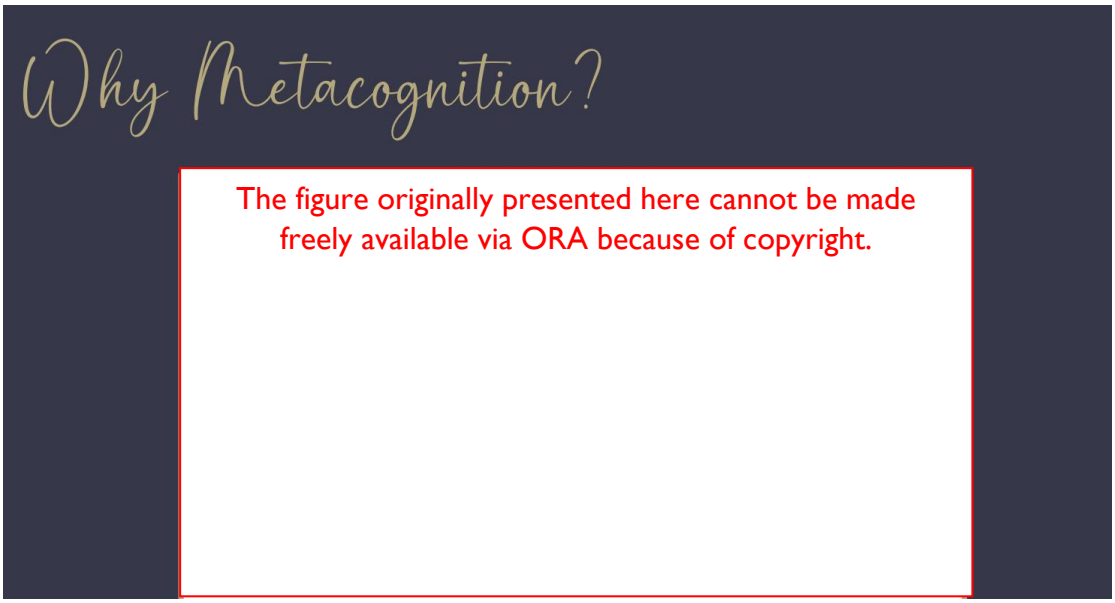
If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact me directly, again on the email above.

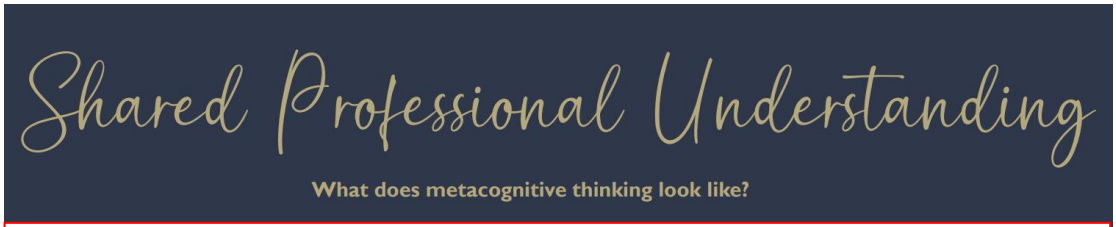
Thank you for reading this information,

Yours faithfully,

[redacted]

Appendix 5: Sample slides from January CPD





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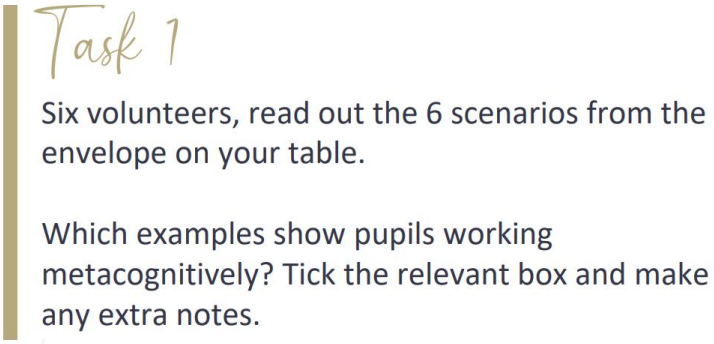

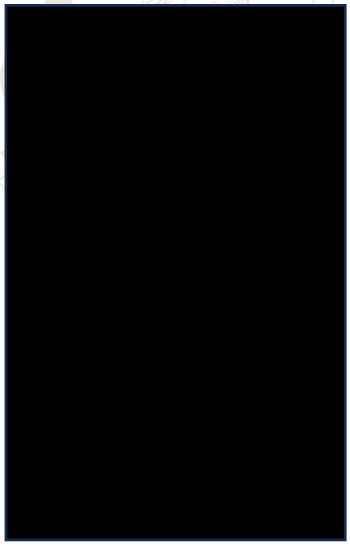

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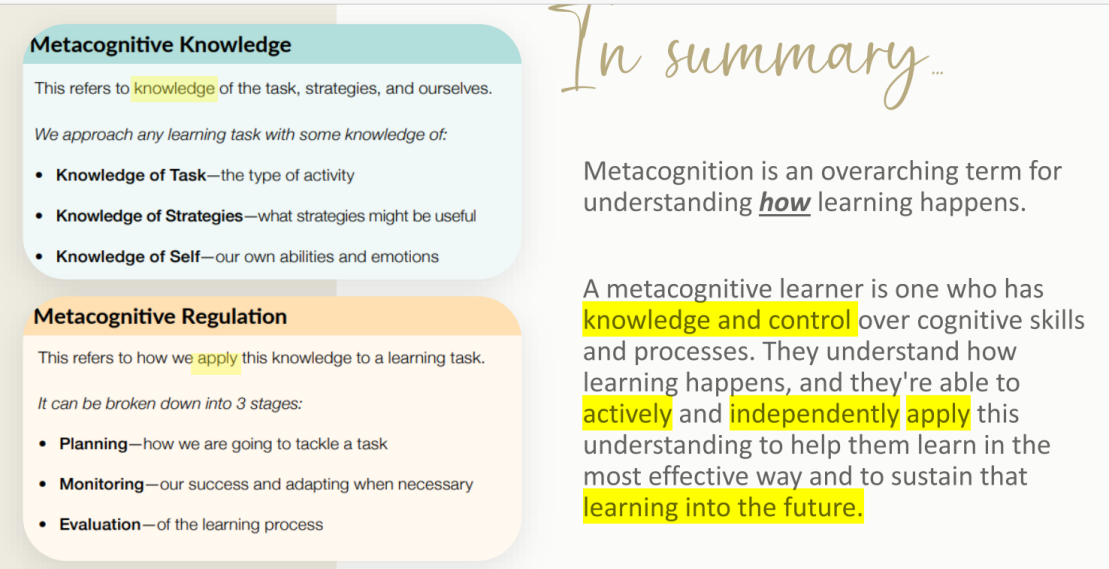
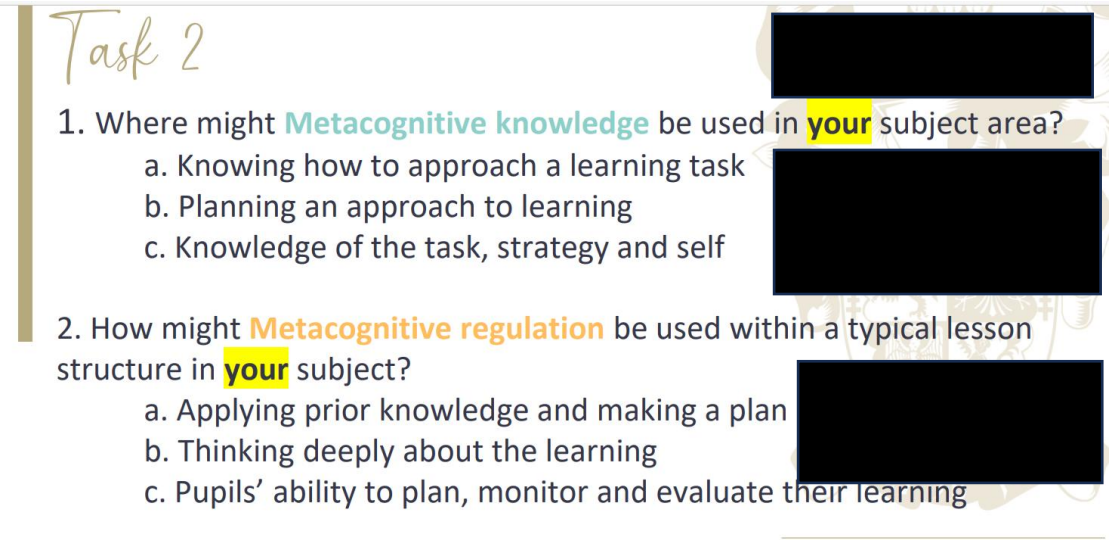

Metacognitive Knowledge
This refers to knowledge of the task, strategies, and ourselves.
We approach any learning task with some knowledge of:
Knowledge of Task—the type of activity
Knowledge of Strategies—what strategies might be useful
Knowledge of Self—our own abilities and emotions
Metacognitive Regulation
This refers to how we apply this knowledge to a learning task.
It can be broken down into 3 stages:
Planning—how we are going to tackle a task
Monitoring—our success and adapting when necessary
Evaluation—of the learning process
In summary...
Metacognition is an overarching term for understanding how learning happens.
A metacognitive learner is one who has knowledge and control over cognitive skills and processes. They understand how learning happens, and they're able to actively and independently apply this understanding to help them learn in the most effective way and to sustain that learning into the future.


Task 2
1. Where might Metacognitive knowledge be used in your subject area?
a. Knowing how to approach a learning task
b. Planning an approach to learning
c. Knowledge of the task, strategy and self
2. How might Metacognitive regulation be used within a typical lesson structure in your subject?
a. Applying prior knowledge and making a plan
b. Thinking deeply about the learning
c. Pupils' ability to plan, monitor and evaluate their learning

- Modelling metacognitive thinking and learned strategies
- The teacher as the 'expert learner'
- Thinking Aloud - verbalising our metacognitive thinking as we work through an explanation.

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(Hattie, 2009)

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Task 3

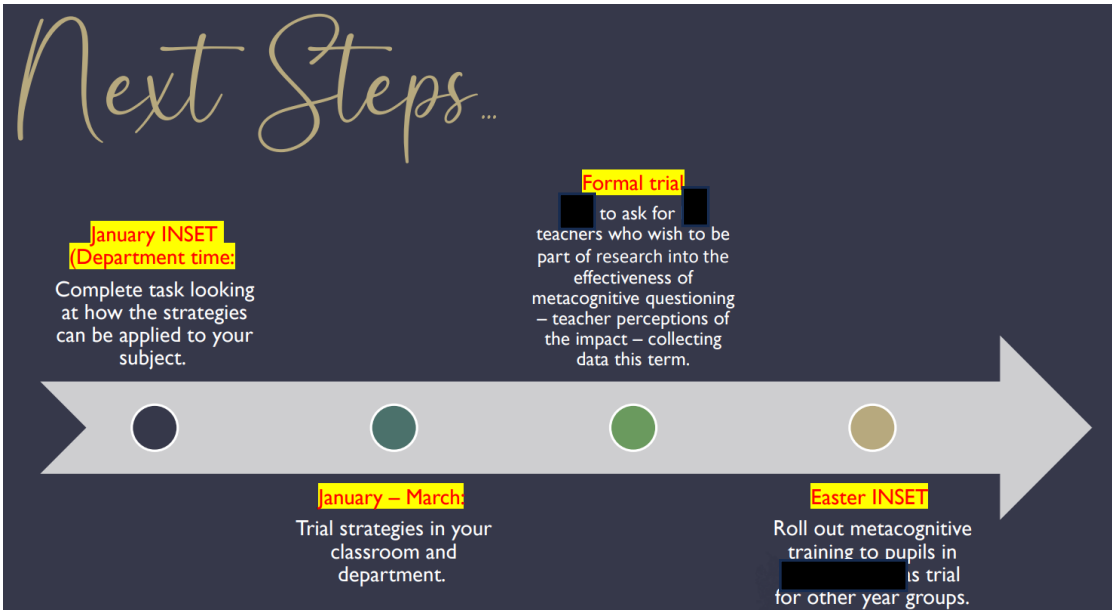
Applying the principles in your department

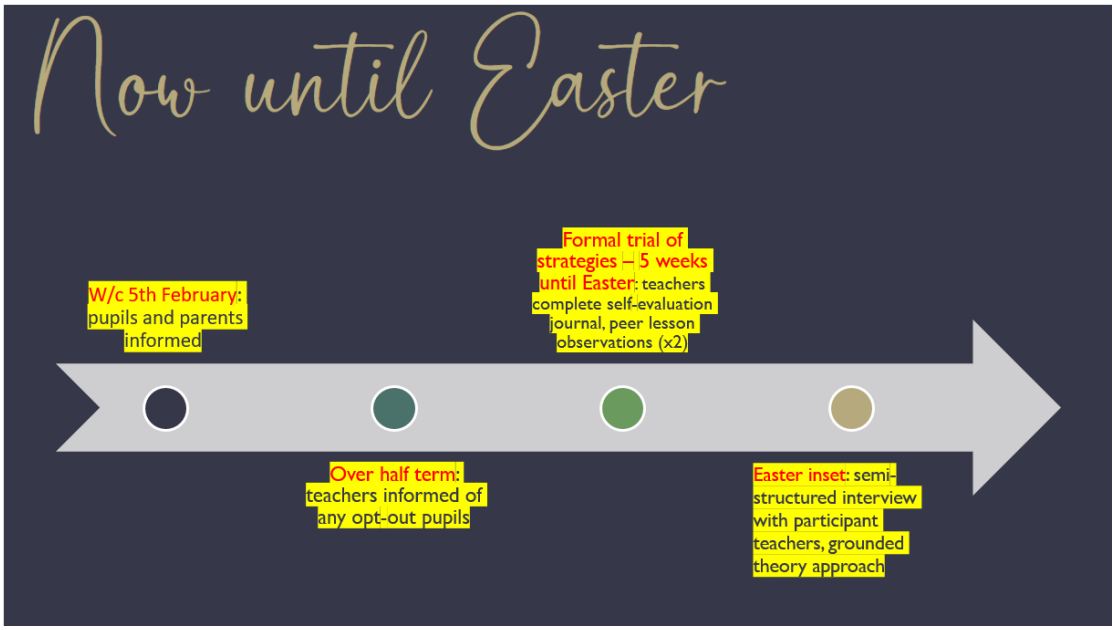
a. Sharing good practice

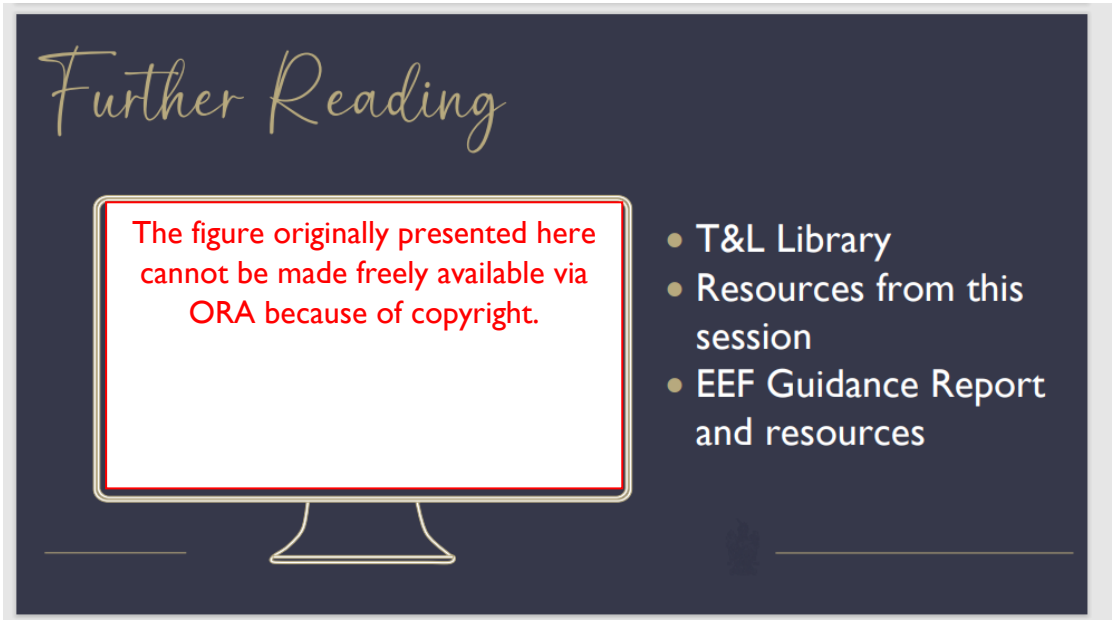
Can you share with your table an example of when used metacognitive modelling or questioning to plan, monitor and evaluate their learning—what was the impact?

b. Moving forward

Review the completed prompt worksheets – which phrases/questions do you think you could add or adapt to your bank of usual phrases to support your pupils' metacognitive skills?




Now until Easter
W/c 5th February: pupils and parents informed
Over half term: teachers informed of any opt-out pupils
Formal trial of strategies – 5 weeks until Easter: teachers complete self-evaluation journal, peer lesson observations (x2)
Easter inset: semi-structured interview with participant teachers, grounded theory approach


Further Reading
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T&L Library
Resources from this session
EEF Guidance Report and resources

Appendix 6: Exemplar pages from teacher self-reflection journal

MODELLING METACOGNITIVE BEHAVIOUR - PLANNING TOOL

These planning tools are designed for you to use when planning how to use a 'think aloud' process in modelling metacognitive behaviour to your pupils, and considering metacognitive questioning that you could use in your classroom. Resources drawn from the EEF toolkit resources

1. Planning my approach

How will you approach this learning task and why?

Examples might be:
What is the problem asking me to do?
- Have I seen problems before that look like this one?
- What information in the problem is important?
- What information is less important?
- What might I need to work out?
- Would drawing a diagram or mindmap help?

.....Enter your own prompts here

2. Monitoring my progress

Is your plan working and why might that be?

Examples might be:
- Is my strategy working?
- Are there different ways to solve this problem?
- Should I think about solving this problem in a different way, or should I stick with my plan?
- Would it help if I ask someone to check my work?

...Enter your own prompts here

3. Evaluating my success

What have you learnt about yourself and why your learning was successful or not?

Examples might be:
- Does my answer make sense? How do I know?
- Am I sure I have answered the question?
- Can I explain to someone else what I did and why I did it?
- Would a different way of solving this problem been quicker?
- Would I solve the problem in a different way if I tried it again

...Enter your own prompts here

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METACOGNITIVE QUESTIONING (MCQ) INTERVENTION JOURNAL

Adapted from EEF's tool "Reflecting on PD"—based on Gibbs reflective cycle (1988) [1]

Complete this journal page to help your evaluation of your LG lesson this week.

Class:		Context of lesson:
Subject:		
SEN?		
EAL?		
Boy/Girl split?		

1. Log of MCQ use this lesson

Use the table to record your use of each stage of MCQ questioning (use a tally system for ease)

Planning	*Monitoring*	*Evaluating*

2. Pupil response to MCQs

- *How did pupils respond to the metacognitive questions?*
- *Did all pupils respond in the same way? If not, in what way did the pupils differ?*

3. Impact on learning behaviours

- *Did you observe an impact of MCQs upon learning behaviours in the pupils?*

4. Impact on learning outcomes

- *Did you observe an impact of using MCQs upon learning outcomes/attainment this lesson?*

5. Evaluation

- *What were the benefits and challenges of using the MCQ framework for you?*
- *For pupils?*

6. Overall reflection?

- *What went well this time?*
- *What might you want to improve next time?*

1. *Adapted from Gibbs, G. 1988. Learning by Doing. A Guide to Teaching and Learning Methods. Oxford Centre for Staff and Learning Development. 2013. Oxford Brooks University. Oxford. UK. ePub Version. https://thoughtsmostlyaboutlearning.files.wordpress.com/2015/12/learning-by-doing-graham-gibbs.pdf*

Appendix 7: Exemplar completed self-reflection journal pages

MODELLING METACOGNITIVE BEHAVIOUR - PLANNING TOOL

These planning tools are designed for you to use when planning how to use a 'think aloud' process in modelling metacognitive behaviour to your pupils, and considering metacognitive questioning that you could use in your classroom. Resources drawn from the EEF toolkit resources

1. Planning my approach

How will you approach this learning task and why?

Examples might be:
What is the problem asking me to do?
• Have I seen problems before that look like this one?
• What information in the problem is important?
• What information is less important?
• What might I need to work out?
• Would drawing a diagram or mindmap help?
.....Enter your own prompts here

- What problems do I come across in timed essay
- How can I avoid?
- How will I make sure I am meeting the m. scheme

Key words

How should I layout?

2. Monitoring my progress

Is your plan working and why might that be?

Examples might be:
• Is my strategy working?
• Are there different ways to solve this problem?
• Should I think about solving this problem in a different way, or should I stick with my plan?
• Would it help if I ask someone to check my work?
...Enter your own prompts here

- check - am I meeting the mark scheme?

3. Evaluating my success

What have you learnt about yourself and why your learning was successful or not?

Examples might be:
• Does my answer make sense? How do I know?
• Am I sure I have answered the question?
• Can I explain to someone else what I did and why I did it?
• Would a different way of solving this problem been quicker?
• Would I solve the problem in a different way if I tried it again
...Enter your own prompts here

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METACOGNITIVE QUESTIONING (MCQ) INTERVENTION JOURNAL
Adapted from EEF's tool "Reflecting on PD"—based on Gibbs reflective cycle (1988) [1]
Complete this journal page to help your evaluation of your LG lesson this week.

Class:	LG	Context of lesson:
Subject:	English	Reflection of Arund Term Assessment
SEN?		
EAL?		
Boy/Girl split?	10/6	

1. Log of MCQ use this lesson

Use the table to record your use of each stage of MCQ questioning (use a tally system for ease)

Planning	Monitoring	Evaluating
III	IIII	IIIII II

2. Pupil response to MCQs

- *How did pupils respond to the metacognitive questions?*

Previous work allowed them to think more reflectively

- *Did all pupils respond in the same way? If not, in what way did the pupils differ?*

Some students were more detailed in their written reflection, making their oral responses better. Diff

3. Impact on learning behaviours

- *Did you observe an impact of MCQs upon learning behaviours in the pupils?*

Students were able to confidently talk about the strengths and weaknesses of their assessment from RJ teacher feedback.

6. Overall reflection?

- *What went well this time?*
- *What might you want to improve next time?*

- Students definitely seem to be 'buying in' to the model.
- Direct students to make targets more SMART, with specifics.

5. Evaluation

- *What were the benefits and challenges of using the MCQ framework for you?*

Made teacher written feedback more effective

- *For pupils?*

Students becoming more self-aware of how they are learning. Imp.

4. Impact on learning outcomes

- *Did you observe an impact of using MCQs upon learning outcomes/attainment this lesson?*

More direct engagement RJ with the learning process than in previous assessments. Imp.

METACOGNITIVE QUESTIONING (MCQ) INTERVENTION JOURNAL

Adapted from EEF's tool "Reflecting on PD"—based on Gibbs reflective cycle (1988) [1]
Complete this journal page to help your evaluation of your LG lesson this week.

Class:	[redacted]
Subject:	
SEN?	
EAL?	
Boy/Girl split?	

Context of lesson:
Have going to museum to Berlin airlift but most of class was missing due to play + theatre visit. Only 5 left - 3 boys 2 girls - (1 real, 2 sens)

1. Log of MCQ use this lesson

Use the table to record your use of each stage of MCQ questioning (use a tally system for ease)

Planning	Monitoring	Evaluating
What might I need to work out.		

2. Pupil response to MCQs

- *How did pupils respond to the metacognitive questions?*

Very well EF

- *Did all pupils respond in the same way? If not, in what way did the pupils differ?* 1 not engaged. Some were very responsive - eg - 'what's that miss' - 'how might we work it out?' - 'It has a number ...' 'what might that mean...' etc.

3. Impact on learning behaviours

- *Did you observe an impact of MCQs upon learning behaviours in the pupils?*

This lesson ended as an impromptu visit to the Collections in the Do Room due to absences.

SEN/behaviour concerns pupil very engaged - asked lots of questions + responded well to MCQ - eg how could we find out? - what do you already know.

Was an opportunity to give pupils a Brag for curiosity.

4. Impact on learning outcomes

- *Did you observe an impact of using MCQs upon learning outcomes/attainment this lesson?*

learning outcomes had changed dramatically!

But - student asked great questions, found them that interested them.

5. Evaluation

- *What were the benefits and challenges of using the MCQ framework for you?*

Would well outside of a classroom instead of me answering their questions with facts it was more - 'how can ya find out?'

- *For pupils?*

Yes - they shared curiosity + despite change of plan responded well. It was more a 'what can we find out' than a 'here is an interesting object from 1797 etc etc'.

6. Overall reflection?

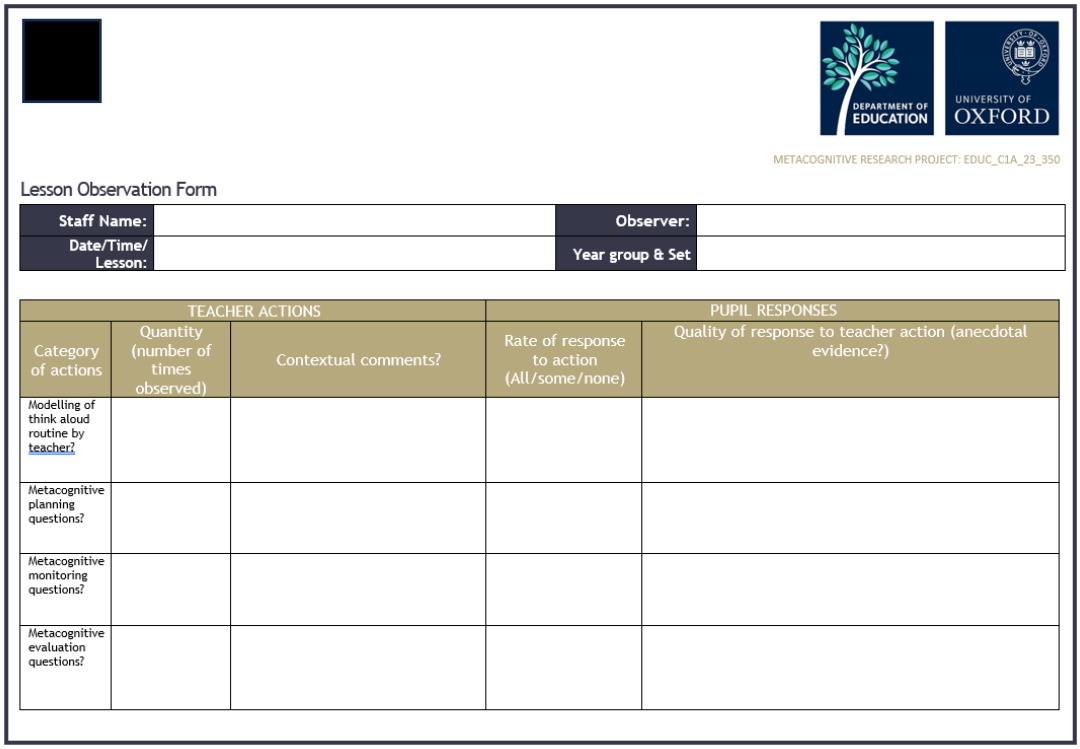
- *What went well this time?*
- *What might you want to improve next time?*

Would probably think more about how future use of objects can be incorporated with MCQ - quiz sheet with mcq on it for example -

1. Adapted from Gibbs, G. 1988. Learning by Doing. A Guide to Teaching and Learning Methods. Oxford Centre for Staff and Learning Development. 2013. Oxford Brooks University. Oxford. UK. ePub Version. https://thoughtsmostlyaboutlearning.files.wordpress.com/2015/12/learning-by-doing-graham-gibbs.pdf

[redacted]

Appendix 8: Peer observation form

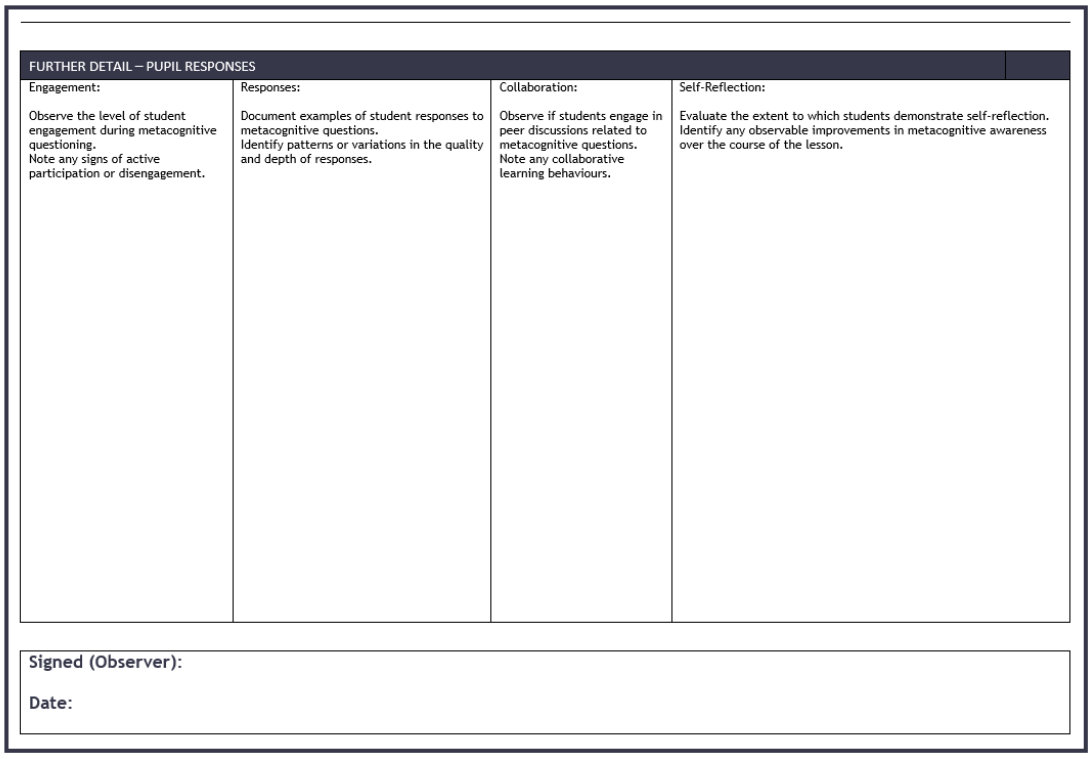


METACOGNITIVE RESEARCH PROJECT: EDUC_C1A_23_350

Lesson Observation Form

Staff Name:		**Observer:**	
Date/Time/ Lesson:		**Year group & Set**	

TEACHER ACTIONS			PUPIL RESPONSES	
Category of actions	Quantity (number of times observed)	Contextual comments?	Rate of response to action (All/some/none)	Quality of response to teacher action (anecdotal evidence?)
Modelling of think aloud routine by teacher?				
Metacognitive planning questions?				
Metacognitive monitoring questions?				
Metacognitive evaluation questions?				



FURTHER DETAIL – PUPIL RESPONSES			
Engagement: Observe the level of student engagement during metacognitive questioning. Note any signs of active participation or disengagement.	Responses: Document examples of student responses to metacognitive questions. Identify patterns or variations in the quality and depth of responses.	Collaboration: Observe if students engage in peer discussions related to metacognitive questions. Note any collaborative learning behaviours.	Self-Reflection: Evaluate the extent to which students demonstrate self-reflection. Identify any observable improvements in metacognitive awareness over the course of the lesson.

Signed (Observer):

Date:

Appendix 9: Exemplar completed peer observation form

[redacted]

UNIVERSITY OF OXFORD

DEPARTMENT OF EDUCATION

METACOGNITIVE RESEARCH PROJECT: EDUC_C1A_23_350

Lesson Observation Form

Staff Name:	[redacted]	**Observer:**	[redacted]
Date/Time/ Lesson:	P1 18/3/24	**Year group & Set**	[redacted]

TEACHER ACTIONS			PUPIL RESPONSES	
Category of actions	Quantity (number of times observed)	Contextual comments?	Rate of response to action (All/some/none)	Quality of response to teacher action (anecdotal evidence?)
Modelling of think aloud routine by teacher? Verbalise thoughts, explain steps, ask yourself questions. 8		- Lesson based on preparing for assessment next lesson. - During students answering written questions teacher modelled the type of things they could consider in their answers. - Students give feedback on their ideas teacher asks questions to encourage students to develop their answers. - Once students had given feedback teacher models how he would prepare.	All/most	Students were able to share their written answers about the last assessment and describe why they think they had success. As individual students gave feedback the rest of the class were attentive. During teacher modelling most students are attentive.
Metacognitive planning questions? How are we going to 8		- Students told the lesson is thinking about thinking and were able to identify that this was metacognition. - Students given the question they will have in the	Some	Some students were able to identify metacognition.

tackle the task?		assessment and asked to think about ways to tackle the question. - Teacher asks students what else they need to be aware of to answer the question. - Assessment criteria shared for the question to help students understand how to plan their answers, with question tasks to help students implement these criteria. - Students given a task to ask what they would do if they can't think of what to say about a quote whilst preparing for their exam.	All	All students were engaged in planning how they can answer the question and engaged in task about the assessment criteria. Many students gave verbal feedback about the task and some students were making notes on what others said.
Metacognitive monitoring questions? Successes and adaptation when necessary	3	- When feedback from students was lacking detail teacher encouraged them to adapt their answer to add more specific detail. - When students asked the teacher to give more information, he encouraged them to think of the information themselves.	Some	
Metacognitive evaluation questions? Evaluate the learning process.	2	- Questions about what went well in the previous assessment and what was difficult about it.		Students confidently gave feedback on their evaluation of the previous assessment and shared in detail what had worked well for them and how they could learn from things that had not gone so well.

FURTHER DETAIL – PUPIL RESPONSES			
Engagement: Observe the level of student engagement during metacognitive questioning. Note any signs of active participation or disengagement.	Responses: Document examples of student responses to metacognitive questions. Identify patterns or variations in the quality and depth of responses.	Collaboration: Observe if students engage in peer discussions related to metacognitive questions. Note any collaborative learning behaviours.	Self-Reflection: Evaluate the extent to which students demonstrate self-reflection. Identify any observable improvements in metacognitive awareness over the course of the lesson.

All students engaged in written question tasks and were keen to share their responses when asked. Teacher ensured that all students were involved by taking responses from a wide range of students. Most students very keen to answer questions and share their ideas during the lesson.	Students able to identify thinking about thinking as metacognition. Students shared models that could help them in their next assessment e.g. PETAL Students described what they would do to prepare for the assessment, giving examples of the key aspects to review/prepare. Students asked questions for further clarification, and the teacher encouraged them to think through the answer themselves.	The parts of this lesson that I saw did not involve group/peer discussion.	Self-reflection was evident in the activity evaluating the previous assessment as students considered how they could improve on this assessment in the next one and shared their ideas.

Signed (Observer) [redacted]

Date: 18/3/24

Appendix 10: Summary of lesson observation forms

Lesson Subject and context	Number of observed teacher actions (thinkaloud/ planning/ monitoring/ evaluating)	Contextual comments about teacher actions	Rate of responses to actions (all/ some/ none)	Quality of responses to teacher actions (anecdotal evidence)	Evidence of student self-reflection
English (higher ability group)	(8/8/3/2)	Teacher modelled type of ideas to consider in upcoming assessment. Students given a task – *what would you do if you can't think of what to say about a quote?* When student asked the teacher for more information, instead encouraged to think of the information themselves. Asked about what went well in previous assessment – what was difficult?	All in response to planning and modelling questions Some in response to monitoring/ evaluation questions	All students engaged in planning how to answer question. Were keen to share responses when asked. Teacher took responses from wide range of students. Many gave verbal feedback on the task and some made notes on what others had said. Most students were confident in giving feedback on their evaluation of the previous assessment and WWW/EBI.	Self-reflection evidence in activity evaluating previous assessment and considering how they could improve. Sharing ideas on this.
RS (mixed ability)	(3/4/2/2)	Teacher used visualiser to model how to interpret and	Most in response to planning questions. Some in response to	All students worked effectively in pairs to decide which were the most appropriate quotes to use –	Some students were able to use sources independently to extract knowledge –

		adapt to a statement about Messiah. Teacher used a structure for answering any question of this type – *use a say, do, feel – how could you apply the structure to this question?* *How can you work out what fits best?* Whilst students on task, teacher monitors – *how can you check if that is correct? Where could you find the answers if you are not sure?*	monitoring and evaluation questions.	they worked together to unpack the quotes using the method modelled.	developing extension from the materials themselves. Some students were able to reflect upon quotes independently and write own responses by end of lesson.
MFL (mixed ability)	(4/3/3/1)	Teacher modelled first task – which was understanding how to pick out tenses – and then matching and linking sentence sections together. *I'm looking for clues to help me.* Then discussed task and how to plan for it - *if you were looking in*	All able to use planning questions for first task. Good level of engagement with this.	Students worked together to solve the vocabulary puzzles – checking answers together. Most able to complete this independently. Second task – powerpoint – working relatively independently on this.	Students were going to be carrying on with second task in the next lesson, an after task evaluation was not observed.

		a verb table, what would you look for? What clues do we look for? Whilst students giving responses – *don't just tell me the answer, tell me what the clues were that you used to find the answer.* Evaluating – *answer was cabine telephonique – what was the clue?*			
English (lower ability)	(10/8/5/3)	Teacher modelled how to approach an exam question – using the PEEL scaffold. Modelling how to use a mind map to plan a question. Modelling how to prioritise points and choose the best one. *What would I do next? How will I choose my quotes? I will look at the rhetorical questions* Planning questions – *what will be the first thing we do?*	All confident on PEEL structure. Very clear on how to use it. All could recall hints on how to approach an exam question. Some students were able to use PEEL independently, others needed a lot of scaffolding support A few were able to think about the quality of points in	Responses to planning questions: *I could highlight key words* *I could make sure I read the question* *I could use a mind map* Students worked on own mind map for a question – using own knowledge. Varied level of support required. This group had very well organised files to help with their recall and this aided their metacognition – quote trackers, retrieval quiz books,	As part of reflection, students were used to using different coloured pens to record what they know and need to work on. Visual support to reflection.

		How would you organise your ideas? Monitoring – *Which of the PEEL sections have you done so far?* *What will you do next?* Evaluating – *Why would I put the one I feel confident about first?*	response to review question		
Physics (mixed ability)	(3/3/2/2)	Teacher modelling how to use an 8 step scaffold to answer questions. *First I'm going to identify the variables* Supporting students through process: Planning *Where are your variables?* Monitoring *Are you confident with your progress?* *Do you want to check with the models around the room?* Evaluation *How could you improve your answer?*	All students were able to apply the scaffolding model to a variety of questions (which became progressively more challenging) Some supported others with more challenging questions.	Students worked together to fill in the scaffold – showed engagement with how process worked. Some higher ability students were observed to be keen to get straight to answer, more reluctant to engage with process	Students were encouraged to evaluate their responses by checking with the completed answers (using the scaffolding approach) which were placed around the room. This approach supported engagement with the reflection process – reflect on how they need to adapt answers – what stage did they go wrong? NB - Second stage of lesson went onto new topic – observation finished.

		What do you need to do differently next time?			
MFL (mixed ability)	(3/3/1/2)	Teacher modelled how to learn vocabulary for a forthcoming assessment. Then discussed use of strategies for task: *How can I find the common features in this word list?* *What should I do before my reading comprehension?* At end of task, students did peer-assessment of vocab test. *Why is it a good idea for us to review test together? Why should we mark each others' work?*	Some responded to the questions – mixture of open and directed questioning. When reviewing test, more passive.	Students keen to share thoughts and discuss strategies. Most joined in with the discussion. Students had some good ideas about benefits of recognising common mistakes through peer assessment. This was evaluated using 'think-pair-share' routine.	Some better at articulating thoughts than others – some had undertaken a strategy but found it hard to define what they had done, others very aware of steps they had followed.
History (mixed ability)	(3/3/4/2)	Teacher modelled approach to an exam question: *This is exactly the same as yesterday, I've just changed the topic?* *What strategies did I use yesterday?*	All seemed engaged. All had some form of linking to yesterday's work. Most of the students used at least some of the	Students started highlighting to find the equivalent information. One student, when encouraged, confidently went back to previous work rather than continuing to ask for support.	Students were confident in improvement *"I have more information now so I feel I can write better"* *"I am writing three paragraphs now but yesterday I only wrote two"*

		What were the two methods we agreed on? Then students completing a new question: *How can you link this to what we did yesterday?* *Where can you find the information to help you?* Monitoring questions: *Check back how you structured your paragraph yesterday?* *What was your first sentence?* *Are you happy with your answer?* *Have you included a "this caused tension because…?."*	resources to help plan their response.	Most students, when asked, could either identify the reasons for tension, or would go back to add more. Students supported each other – sharing ideas.	

Appendix 11: Planned semi-structured interview questions

QUESTIONS TO SUPPORT SEMI-STRUCTURED INTERVIEW WITH TEACHER PARTICIPANTS

Research ethics reference: EDUC_C1A_23_350

TUESDAY 30 APRIL 2024

SUBJECT: JANUARY CPD

How much did you already know about metacognitive questioning before our CPD in January?

What aspects of the January CPD did you find most useful?

What aspects of the January CPD did you find least useful?

SUBJECT: SELF-REFLECTION JOURNAL

What interested you about your self-reflection in the diaries?

Were you surprised by any of your entries? Why was this?

SUBJECT: USING METACOGNITIVE QUESTIONS IN YOUR CLASSES

How easy did you find applying the general principles of metacognitive questioning in your classes? Why do you think that might be?

Do you think some types of metacognitive questions were more effective than others? Why do you think that might be?

How do you think your students responded to metacognitive questioning?

Do you think that the students in your class have become more self-regulating as a result? Is that the case for all?

Have some students responded better to this intervention than others? Why do you think that is?

Appendix 12: Coded transcript from semi-structured interview

Time		Teacher code	Comment summary	Code
0:03		Me	Q1: How much did you already know about metacognitive questioning before our CPD in January?	
00:25		G F D A	Not for me. Not a huge amount. We have talked about it obviously in the teaching learning meetings. But it did make it a lot clearer. For me it's something I've come across several times before - in my other place. So I'm aware of it and it is something that maybe not consciously, but I do use often. It was a bit part of my teaching training, but this is going back a long time ago. So it was really good to have that refresher and think again about what it is. So, when I first moved to my previous school I was part of the research school over there and the focus of metacognition and the EEF teacher toolkit and ranking was discussed.	Introduction question – not coded
01.56		Me	Q2 What aspects of the January CPD did you find most useful? What aspects of the January CPD did you find least useful?	

02:20		G	I think considering those questions, and what we might say, or what we might do as our own questions was really useful.	SSC
		A	Having examples was really useful. Actually starting to ask these questions yourself and then thinking about how you could use them in the classroom.	SSC
		C	Having the modeling practice, having the example questions. How we can help to take the theory into the practice	Ct
		F	I think the buzz around the room was best when we're all collaborating in our departments. I think to get so little time to do that, especially with our SMH counterparts, to be able to come together and have that discussion, that subject specific discussion about how metacognition translates into our departments That's where I saw people really engaging.	Tt
		G	It'd just be nice to have more time to do this. It was a very small section of INSET and it would be lovely if it was the largest section of INSET.	Tt
		D	To actually look at adapting resources and things like that with more time.	Ct
		B	Perhaps have some more examples we could use?	
		G	Wouldn't it be nice if we could have filmed something that we could share? To share how we have done this in practice?	
		D	Yes, because you showed me that video of the German teacher and that was really useful. So, you know, the video element, somehow it comes alive in a way it doesn't on paper, you know?	Ct
		F	Yes, I think that would be a good idea to show, because considering we're pushing this forward Rolling it out for all staff to see what it looks like in, in a	Ct

			lesson. A snapshot of how you, how you'd use it and how it's different from the normal.	Ct
		D	Yes, and also to share, because for example, I don't know what you've done. You don't know what I've done. We did a little sharing in the meeting and	Tt
		A	that was useful, but it wasn't enough because it was in front of people and it was too big a room.	
		B	I would've loved to be in a context where it is just us, you know, talking about it or even going to the classroom in situ and watch it. That's how I learned the most.	
			It's that thinking time as well. Like, you always go away on a course and you come back buzzing with ideas but you just never have that thinking time to	Tt
			actually think, how can I implement this? Because on Monday you are straight into the next lesson. So it gave us a little bit of time with that day, but we've	SSC
		F	still only have an hour and a half slot ultimately. So it's about finding a way of doing that INSET which means that we are actually dedicating time to it and not going off and doing our other department things.	
			I do think if you're going to use a common set of words we all need to know what that means in each subject area because otherwise we can't say to a	
			child, look, remember, it's just like what you do in physics with, which is what you are wanting them to do ultimately, isn't it? To transfer those particular steps of learning and be able to use them in each subject area.	SSC
09:03		Me	Q3 What interested you about your self-reflection in the diaries? Were you surprised by any of your entries? Why was this?	
09:17		E	I think I said it before, but I suddenly noticed that my EAL students were validated as experts. Because I was saying how would you do this? How would you do that? And they started to say, well, actually in Swedish it's like this. And this was good	DI

			and made me realize I hadn't validated them as expert language learners prior to that.	Ib
		D	They know how to learn a language, but they hadn't realised until it was sort of laid open that they actually knew how to do it. They were just doing it.	
		C	I think I found with the self-reflection, I think I found it was how much it impacted future planning, really thinking. Have I used meta questioning very much in that? We know that the current lesson will always impact future planning, but it was doing it more and by actually writing it down it was making me very focused on what I need to do more of.	RP
		G	I started realising through this, how many times I was probably stopping them from using a meta cognitive approach because I was jumping in with the answers and things like that. So I'd started to reflect by keeping a record. I've got to step back sometimes and some of the questions I need to be asking, I need to be more automatically saying And what do you think, where might we find it? What approach would work?	RP
		B	I liked the process of having questions to respond to and getting you thinking about your own teaching because it's not just about the students. Isn't it about the way that you reflect as a teacher and prepare future lessons? There was a little bit of overlapping in some of the questions I found. Some of that I felt like I could have fit that into a couple of the boxes. But generally speaking, I felt it was a positive experience and it certainly made me think as a reflective practitioner.	Rp
		A	Well, I have to admit and be honest and confess that I didn't engage with this booklet as much as I should have done. I've really liked the process and they've responded really well.	A

			And it worked really well and it was really good to follow that process. But I didn't quite engage with this. I don't know exactly why, but I found it just too scary, just too much of it. With everything that we have to do.	
		D	Yes, getting to this was the big task but I can see the value for the students and how they've made amazing progress but I didn't engage with this.	A
		F	The actual reflection sheet quite useful, but I didn't use the planning sheet. That was just because I have notes I thought, and I have a planner that I used and I wanted everything to be in one place.	A
		C	I really liked that page because I just highlighted really quickly the ones I wanted to use that lesson. And that's what I'm hoping to do. Once we do the subject specific ones, I can just quickly grab it there. I think for me, the best thing was that box five, where it's really rare that you actually take the time to walk away from a lesson goal, what worked, what didn't. And especially what benefits and challenges for the students and going around let me just put myself into and take that time for myself into xx' Shoes and think, what did he find challenging in that lesson? It was nice to have time to do that and force myself to do that.	RP
		G	I think for me it was realising the impact and it got me thinking again about the EAL students. Particularly for history it can be a bit of a cultural thing. A lot of them are used to memorising facts. Whereas students who are used to the English education system are much more used to that sort of questioning. So there was a little bit of resistance and then I started thinking how can I somehow make this more sort of applicable to them. So it's not too much. It seemed, for some of them it was more of a challenge. And that could be language or it could be like I say, different experiences of what history actually is.	Dc

		A	I think I was quite surprised the speed at which the changes started to happen in terms of when you started because I was planning an essay and as soon as we started, I was surprised how quickly the students picked it up and started using it in their own planning, like reading a plan with different question, but they were able to go back through those steps. It's quite surprising, especially because I've got bottom set as well. I'm not saying they'll remember it next lesson. But they were able to pick it up and run with it quite quickly.	Is
		B	I was really impressed - I'd had a lesson on animal farm and it was similar thing. So, timed essay preparation, looking back at what we'd done in the previous assessments and what we need to do for the one that was coming up. I was on a trip when they were actually doing the assessments and they all got on with it, and they're really good and they've really taken on board a lot of the things that we looked at in those lessons. So it's definitely helpful and it gets them thinking and starting to realise why they didn't do so well in the last one and what they need to do to improve. So I've definitely seen an impact there.	Io
		G	They did better than I thought they would in the assessment as well. It's about fostering the independence as well. I have some students that have been used to always putting their hands up in assessments; can I ask? can I do this? And I said you've looked at something like this before, what did you do? So I'm not answering any questions. And then they would think about it. So I do feel like I'm getting fewer questions, you know, there's a pause before they're asking those questions. I was just thinking about what some of the others were saying there about how quickly the kids did pick it up. I completely agree. I thought it would be completely forgotten, but they were much, much better than I thought at	SR

		F D G	remembering. We did that little refresher last week and then immediately afterwards it made a difference. They could remember what was going on. Still some of them put their hands on very quickly, but were really accepting immediately if you say no, think about it. I was amazed how quickly it caught on. Wonderful. I think it depends on the activity you set, for example, if you're doing an essay or like the activity that I used because it was a vocabulary learning, so it was a small task. So encouraging self-reflection on that is great. It's very straightforward. But I would like to do something a little bit bigger so I can encourage the self-reflection and informed discussion a bit more in depth. Because the type of activity reduces the interaction if it's just a learning task. It would be interesting to see those children who, if they applied the same method in classes that weren't being taught in that way, still did this, because obviously we're not all subjects here, are we? To see if other teachers noticed anything?	Is Io Dt Evaluative
22:18		Me	Q4 How easy did you find applying the general principles of metacognitive questioning in your classes? Why do you think that might be?	
22:36		A B	Think it fits really well with English, doesn't it? xx? For the most part it does. It's difficult when you are maybe reading a chapter of a text, it's difficult there because there's not many opportunities for questions, but on how to approach comprehension questions. We could talk to them about that. Maybe not necessarily planning, but it does fit really well because we do plan and teach this kind of skills, we have them to monitor. We always have success criteria and we'll always do some form of collaboration. So it does fit well to writing at least.	SSC SC Cp

		A	And it's a subject where it's often open to interpretation. So we have to get them to think about different things.	SSC
		F	In the sciences, I did have to put some thought into how I'm going to apply What was for me, useful was a couple lessons later with building a circuit and I realized I was, I was doing and saying this, and I used the word strategy before I even realised it, it was just an assembly of strategy. I know it is a way of building a circuit. I always tell them to set up, look at a circuit diagram, set out the components and then add why is it, but then, that's a strategy and I thought then, I've been telling them to think if something doesn't work, if circuit's not working, then change one wire at a time and things like that. And that's how I introduced the ideas. I'm sort of fascinated to see when I'm going to my next topic. Now I've thought about it a bit, how will that happen again, now I realise actually what I'm doing, this has put some words to what I've been doing all along.	SSC Dt
		C	Which is really helpful for the kids to say, this is your strategy. Think this is your strategy and then using the language. So initially I was a thinking of how I'm gonna do this, but it is much better than I thought it would be.	
		G	In history, I think once I got into the habit of changing my default form of questioning and using it more, it just got easier and more natural. Like you say, suddenly you realise that's what you were doing and spotting opportunities even if you hadn't planned them. So for instance, they have just done some straightforward studies. They had to find out about Yar and Potsdam conferences, who was there, what happened, what was decided. And so straight away they're sort of, ok we're looking on the internet now, so, what do we do, where should we find the information? And one of the students just said, oh BBC Bitesize is really good. I've used it before. I bet it will have something. And so I said, well our student recommendation is from is BBC Bitesize, let's check it out. And so there was a little opportunity there. So I think it is sometimes a bit like English, there are certain questions that,	SSC Io Ib

		D	you know, are really important. And with those source questions, how do I apply what I already know is actually a key thing and applying it to how you interpret a source. So the 'let's test this' idea against prior knowledge is actually a really important thing to do. So that was the obvious one to use the strategy with. The general structure I think in languages is very natural, it is very adaptable and almost organic to the materials. And it's good because for example, the strategy was talking about introducing the language, and I asked my class how they think about their strategies.They reflect before we do anything else. This is the reflection process prior to the actual activity. And I give them a bit of time to share with a person next to you and they all came up with; read the text first, scan for words that you don't know, then read the questions. But then some, some of them said no, it's better to read the questions first of all because then you know what they asking you for. And then when you read the text the first time, you know already your brain will automatically try to answer those questions.	SSC Cp
		E	And also, our textbook is brand new. It is very metacognitive And I had of course previously been slightly avoiding all these share with a partner and discuss. So I'm more likely to use that now. And in a way for me it's sort of going back more to how I was taught; that idea of looking at constructive parts of speech.	RP
28:11		Me	Q5 Do you think some types of metacognitive questions were more effective than others? Why do you think that might be?	
28:37		A	They really like any planning based ones. So have we seen this before? What did we do before? What should I do? Mine definitely struggle with the evaluation side. But again, my class is quite a low ability class and I think sometimes they struggle with finding the right language to explain how they	SC

			feel about their work. But they definitely responded to that, we seen this before, what does this look like? Because they like spotting those things.	
		B	I agree. I think the planning was the most successful of the three. It's getting them into a habit of stopping and thinking rather than going on automatically. Because they plan it and they've thought about what they did and then they go on and they might keep going until they've finished it without actually stopping thinking. So it's just about trying to get them to stop, to pause.	SC
		G	When they did their assessment, we did a bit of a checklist. You know, have you read through, have you made sure you've included information, have you followed the structure so I don't think they were doing that during the process, but when they were ready to hand their work in I said, now just remember have a quick look,	SC
		D	I think in the future I will avoid the word metacognition and I think it's more about getting into the thinking. So it can be a great metacognition activity, but doesn't mention anything about the word and it gets them to reflect on prior activity or sharing their experiences, the problem solving the strategies, whatever it is, without being so obvious. Especially with LG because they are the youngest really. Maybe with the higher line they will like it. But with LG I think I will be a bit more discreet with the language interviews. Avoid that language and just go straight into the activities so they do the job and reflect or whatever the process without being so obvious about it.	Shared language
30:12		Me	Q6 How do you think your students responded to metacognitive questioning? Have some students responded better to this intervention than others? Why do you think that is?	
30:41		F	I found it harder to get higher ability students to engage with this. They thought they could do the task. They didn't think they need to plan, I don't need to monitor, I can just do it. Why am I bothering with all this. The low	Da

			ability? Great. They engaged with it much better. But the high ability actually found it hard and I found them sort of just rushing through things.	
		A	Maybe because they've probably had failure before. So they know they need to improve whereas those who are more able think they are doing it right.	Da
		F	They just sort of went straight through. That's almost like when they don't show the workings in maths, they get the correct answer. They don't understand why they have to show the working.	Dt
		A	But again, I think, for mine they need those building blocks because that's what they're lacking in the first place in order to apply.	
		B	I thought that it was running very well. They were very positive and they were able to answer in great detail reasons why they'd done certain things and quite confidently. I didn't get any resistance.	
		G	It was strange initially when we started, but I was already doing similar sorts of things. I was always asking why, but as soon as that metacognition word came in, then they knew they were doing something but it was positive. And in that set too, there's a mixture of abilities But they were all quite positive and, and wanting to reflect.	Evaluative
		B	I think I would say that the more able were able to better articulate their ideas and to identify where they'd gone wrong. Some of the weaker ones perhaps couldn't always see what the mistake was or what they'd not done or what they needed to do. But certainly getting them asking those questions I think was the very positive thing.	Dl
		C	Again, it was really good, especially for those who need chunking and scaffolding. It worked really well with those kind of needs.	

		G	It was good for all of them. I think perhaps because it's written rather than perhaps a more practical thing like science, maybe they feel like they've never seen it before, a new topic, or new type of question. So they seemed to all benefit from it. But it was the independence of thought that really worked with one or two of the students. And I wondered if it was just the students with more confident use of English language who were happier with it So xx and xx were less happy than xx was.	Da/DI
		E	One thing I found very helpful was the integrating of the modeling. So doing the question, posing some metacognitive question and getting them to think and talk about it. And then bringing in the modeling of what I would do, which helped them to see my thinking and maybe apply to their own ideas or what they've not done. So I think the modelling was quite effective.	SSC
		B	I've said a difficulty that there is for the more able people is what we're actually wanting them to do is internalise this process rather than just speak or write or read. So it is often more difficult for them to take that step back and think, well actually how did I do it? But it can be useful in getting them to write more. So with the more able students when I'd go around, I would say, okay, lovely. But how about describing that or telling me when you did it, how you felt about it? I think getting them to write down the thoughts. When I asked a question, I'd give them some time and got them to write again in their exercise books what their response was and then it was like an extra stage for them when I asked them again, they could articulate it based on what they had actually written down in more detail.	Da/DI
		F	My problem was most of the tasks we did are quite closed. Sort of do a calculation once you got the answer and that's it. And that was it with the higher able higher people who can just can do that. I sort of didn't see the point in thinking about why they can do it. because from their point view, why would I do it?	Dt

		G D	I suppose some of the higher ability students, they quite liked it. If they were helping somebody else, maybe about where we going to find the information? Well with my lesson xx had found that he was having a conversation with xx, who he sits next to, and we moved on to the space race and he was googling about what's the man on the moon thing? And I said, well let's have a look at that website. What is it about that makes it valid, is there anything reliable? Is it giving you the counter argument? You know? And then xx was talking to him as well and so it gave them this idea of how can I trust a source? How can I trust a source of information? And it gave him an opportunity to have the conversation with somebody. So, so maybe that's kind of perhaps where it works better for higher ability students. Collaboration. Maybe they are more interested in talking to a partner. Some students contributed better than others. For example, one of them said, well I use Quizlet and so I said, oh, that's quite clever. So, after that they were trying to say something that it sounded clever somehow. Or at least not repeating everything that everybody else was saying. So I think it's promoting that motivation to encourage them.	Cp Cp
40:31		Me	Q7 Do you think that the students in your class have become more self-regulating as a result? Is that the case for all?	
40:53		G E A	I would say most of them are comfortable in regulating their own learning, But with a specific tasks. So I think they probably need a lot of modelling if it was something different yes, I think there is. I think it's quite surprising actually how quick it seemed to have an impact. And some, sometimes that meant the others were lifting the ones who were a bit more reticent. Yes, they are learning together about this.	SR Is

		F	Yes. So as long as the mass of the class can move in that direction, it maybe encourages the others too. And it is definitely taking steps in the right direction. I think it's just because of the ability and makeup of my class and memory difficulties. It will take constant reinforcement and across the board to get it moving and getting some real momentum, but definitely in the right direction. I completely agree with that. They've gone with it really well. I think if I asked them about it directly now, can you remember anything? They'd probably say yes. But if I just left them to it for another week or two, they would give a different answer.	Io Io

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