

Identify an area of interest where you would adopt a literature review as a research methodology.

Overview

Throughout this literature review, there shall be a discussion of how metacognition could be developed in children within the primary school sector. More specifically, how metacognitive skills can be developed throughout teaching and learning experiences. Further, there shall be discussion of the impact that metacognition can have upon children's development.

Context

Empirical evidence would suggest that metacognition can often play an important role in a child's development academically, cognitively, and emotionally. The author's personal hypothesis is that children thrive when they fully understand how to effectively activate and utilise their metacognition. The author's personal opinion highlights a fascination about children understanding the power of utilising their metacognitive skills. These aforementioned factors and professional curiosity forms the basis of this literature review. Children's time in primary school has been highlighted as a crucial time period for the development of their metacognition (Roebbers, 2014). The overarching aim of this literature review is to highlight the significance of metacognition as a component for developing thinking and fostering independent learners within the primary school setting.

Throughout research, there has been a distinction made between general metacognition and domain-specific metacognition (Afflerbach et al., 2006). General metacognition could be regarded as being instructed simultaneously within different learning contexts and potentially more transferable to other situations. Throughout primary school practitioners are to provide children with a well balanced and broad curriculum, therefore the author has chosen to focus upon general metacognition for the purpose of this literature review. Consequently, due to the fact that general metacognition is applicable across various areas of learning and experiences. Some suggest that metacognition is multidimensional and is arguably domain-general (Schraw, 1998). This could be considered as beneficial as the skills

of metacognition can be used across many disciplines. One of the aims of this literature review is to explore what impact metacognition has within the primary school sector.

Some may argue that the concept of metacognition has always existed. It is only that recently it has become so readily researched. It could be suggested that the field of metacognition has been more thoroughly researched within the past four decades (Tanner, 2017). In contrast, there is some suggestion that as a theory metacognition is under-researched and it does not have a definite strong and well developed conceptual foundation (Tarricone, 2011). Some would suggest that very few researchers have examined learning and the related metacognitive processes in depth (Wall and Higgins, 2006). Henceforth, the author was enthused to investigate more about an area of education that has seemingly not been so widely researched. However in apparent contradiction, some would suggest there is a wide body of research available to practitioners based upon the broad topic of metacognition (Holt and Tarrant, 2016). Hence suggesting that metacognition as a whole is researched well, however, specific topics related to metacognition are not so researched in-depth.

The author agrees to an extent, that as a theory metacognition may not be so readily researched. However, upon beginning research to form this literature review the author discovered there are many interconnected areas epistemologically linked to metacognition. Within the domain of metacognition there are sub-domains such as metacognitive regulation and metacognitive skills. Throughout the literature review, the author intends to explore the somewhat associated concepts within the realm of metacognition. However, some have suggested that many of the concepts associated with metacognition are regularly contested (Proust, 2010). Some have suggested that the terminological contention is that broad it makes the usage of the terms problematic (Martin & McLellan, 2009). However, throughout research the author has noticed commonalities within the associated concepts.

The term metacognition has sometimes been referred to as something of an unclear concept (Wellman, 1985). Some could suggest that metacognition is complex and multifaceted thus there is no strong and well developed definition which presents an issue for those practitioners who try to engage with it (Efklides, 2008). Even though metacognition has been described as a word that has no definite meaning (Tarricone, 2011; Robson, 2006),

essentially metacognition could be defined as knowing about knowing. Even though the author acknowledges the varying definitions of metacognition, as an operational definition for the purpose of this assignment, metacognition is referring to thinking about one's own thinking. To expand, metacognition refers to the awareness children have of their own knowledge and beliefs about themselves and their coinciding ability to regulate their own learning. One of the objectives of the literature review is to explore how metacognition can be developed within children in the primary school sector. Also, whether metacognition attributes to skilful thinking and whether it is an important aspect of teaching and learning.

As a practitioner, the author constantly endeavours to help children to develop their thinking skills throughout teaching and learning experiences. Hence why the author has chosen to research a topic that is somewhat integral to encouraging and developing thinking. The author is a teacher based within the Key Stage Two phase at a primary school situated in the South Wales valleys. Moreover, when beginning research the author discovered that there is a concept that only older children possess metacognitive abilities. Henceforth, this is area is an objective that the author intends to investigate within the literature review.

Introduction- What is metacognition?

Metacognition could be described as an awareness or analysis of one's individual learning or thinking processes (Flavell, 1979). Flavell (1979) is most commonly acknowledged as introducing the term metacognition as a result of his research during the late twentieth century which was based upon children's knowledge and understanding alongside their control of their cognitive processes. However, in contrast, some have argued that even Flavell the apparent founder of the term metacognition did not have a detailed concept of the term (Wilson, 1999). Thus potentially highlighting why the term metacognition is so regularly contested. Further, some suggest that metacognition is an awareness of one's own cognitive process (Mayer, 2003; Statt, 1998). Some would suggest that metacognition is a notion that could refer to a variety of epistemological cognitive processes. Further, some suggest that due to the terminological indecision surrounding the concept there can be issues regarding just exactly what the concept metacognition means (Martin & McLellan, 2009).

Within the primary school sector, it could be argued that fundamentally metacognition is concerned with directing and controlling learning (Brown, 1987). A suggestion that shall be

discussed within the literature review. As a theory, it could be argued that metacognition is very complex (Burns, 2020). It could be suggested that cognitive skills are essential to complete an activity, whereas metacognitive skills aid understanding of how the task was completed (Garner, 1987). Some suggest that metacognition is integral to effective learning as it encourages and enables children to utilise their cognitive skills better, also it can help to highlight potential weaknesses that can be aided by developing stronger cognitive skills (Schraw, 1998). It has been suggested that reflection is a core component when developing metacognition (Flavell, 1979). There is some suggestion that people acquire more knowledge from reflecting upon personal experiences as opposed to just experiencing the actual experiences themselves (Dewey, 1933). Hereby, these points somewhat suggest that metacognition is an important component of learning and self-reflection.

Some cognitive psychologists have described metacognition as an executive control system of the mind that possesses higher-order cognitions that aid an individual's ideas, knowledge and understanding (Miller, 2000; Newell and Simon, 1972; Weinert, 1987). One major component of metacognition, it could be suggested, is metacognitive regulation (Flavell, 1979). Some have highlighted how metacognitive regulation requires a certain set of skills which are interlinked with monitoring and self-regulation, which are utilised during an individual's own cognitive activities (Schneider, 2008). Another of the three major components of metacognition that Flavell (1979) distinguished was metacognitive skills. It is sometimes suggested that pupils with better metacognitive skills are more flexible in their approach towards learning. There have been numerous debates around the developmental process of metacognitive skills. Moreover, as an operational definition, metacognitive skills have been described as tools that empower the learner. This suggestion shall be further elaborated throughout the literature review.

Metacognition in Primary School Learners

Metacognition has often been interconnected with effective teaching and learning, with research often highlighting the beneficial effects and impact of metacognition for educational achievement within most educational contexts (Dignath, Büttner, & Langfeldt, 2008). However, one major debate surrounding the topic of metacognition is based upon the age at which children develop their metacognitive abilities. In apparent contention to other research, there have been studies which demonstrate evidence of younger children's

metacognitive abilities (Whitebread and Pino-Pasternak, 2010). Some research highlights children of the age of three are able to engage in a broad range of metacognitive activities, such as target setting and checking their understanding (Education Endowment Foundation, unknown date). Even though younger children display metacognitive processes, yet cannot describe them does not mean they are not occurring (Cambridge Assessment International Education, unknown date).

However, many researchers have highlighted how metacognition develops best in older children. Some would suggest that the extent of self-knowledge could be quite inaccurate until about eight years of age, often with children being over-optimistic about their levels of metacognitive ability and knowledge (Clark and Dumas, 2016). Moreover, some have argued that metacognitive skills eventually and fully emerge at the age of eight to ten years, and develop during the time thereafter (Berk, 2003; Afflerbach et al., 2006). Some suggest that older children, potentially Key Stage Two age, possess better metacognitive skills than younger children, who could arguably be Foundation Phase age. Conclusions from cognitive psychological research demonstrated that children became more masterful in evaluating their own performance and regulating their cognition between nine and twelve years old (Roehrs, Schmid, & Roderer, 2009). However, in apparent contrast, some research highlights that metacognition is arguably central in improving learner outcomes across all age ranges (Baas et al., 2015). Therefore highlighting that metacognition is an important component that can potentially be developed in all children regardless of age.

Some have argued that as children develop they gain a better awareness of their cognitive and thinking processes awhile gaining the potential to better utilise and develop their metacognitive ability (Vygotsky, 1962; Piaget, 1964). However, others suggest it is a misinformed misconception that metacognition is merely and solely developed effectively in older children (Stringer and Quigley, 2018; Education Endowment Foundation, unknown date). Despite older children being able to demonstrate a broader range of metacognitive strategies, there is evidence that suggests that younger children can indeed develop metacognitive knowledge, even at a young age (Education Endowment Foundation, unknown date). Promoting and highlighting the useful benefits of metacognition begins with highlighting an awareness among children that metacognition exists, explaining its purpose and hereby increasing academic success (Schraw, 1998). Hereby, arguably promotion of

metacognition could be fostered even within young children if done appropriately and successfully. Despite the extensive debate surrounding the age that children develop their metacognitive skills it could be suggested that regardless of age, when provided with sufficient time and the correct environment and equipment children can effectively develop their metacognitive skills.

Some research perceives self-regulation to be a component of metacognition, whereas other research considers metacognition to be a component of self-regulation (Veenman et al, 2014). Despite this potential conflict, arguably the two concepts are certainly interlinked. The new Welsh curriculum arguably strives to foster life-long learning at school. It could be suggested that a great deal of research has increasingly explored the promotion of self-regulated learning (Donaldson, 2015; Büttner & Dignath, 2008). Self-regulation is one of the contested attributes to successful metacognition. Arguably, self-regulation is a skill children need opportunities to develop. Practitioners can help children to develop their self-regulation in various ways. Furthermore, it is suggested that in today's society there is a requirement for children to learn in a self-regulated manner as it could help them through their entire life (Welsh Assembly Government, 2010; Büttner & Dignath, 2008). Hence, metacognition could arguably help contribute to development of self-regulation skills, with these two concepts being intrinsically linked. Becoming more metacognitively aware possesses epistemological links with being more reflective, actively conscious and aware of personal progress (Conyers and Wilson, 2014).

Metacognitive practices can aid learners in becoming aware of their personal strengths and weaknesses (Chick et al., 2009; Education Endowment Foundation, unknown date). This could also be known as a person variable (Flavell, 1979). Whereby a successful metacognitive learner possesses a strong awareness of their own strengths and weaknesses. Possessing the ability think flexibility and control negotiation can arguably aid children to develop their original ideas and can help them realise they can consider choices based upon their own understanding (May, 2013). However, there is some debate surrounding whether lower ability students could be disadvantaged by metacognitive skills. It is argued that children who utilise metacognitive strategies are probably able to achieve more than their peers who do not use metacognitive strategies. Moreover, research has highlighted that developing a learner's metacognitive abilities may potentially aid any cognitive limitations

they possess (Cambridge Assessment International Education, unknown date). However, there is some suggestion that children with some additional learning needs may not possess the skills to direct their own learning and metacognitive strategies could help them apply them in different situations (Lerner and Kline, 2006). Children should not be disadvantaged and therefore it is important that children, for whom metacognition does not develop naturally, get relevant assistance to develop their metacognitive abilities (de Jager et al., 2015).

Metacognition can sometimes have both emotional and social implications for the developing child (May, 2013). Furthermore, it could be suggested metacognitive experiences are full of emotion and thereby can be effected by a child's mood (Larkin, 2010). Hereby, it is important for practitioners to be sensitive and aware of their children's needs. Moreover, some have highlighted how metacognitive strategies are interlinked with self-efficacy, thus there could be potentially implications for a child's self-esteem if the metacognitive process does not result well for them (Borkowski, 1996). It should be acknowledged that every child is unique and learns in different ways, metacognition is undoubtedly a skill that can be adapted for all learners to access. Some have highlighted how sometimes pupils are able to demonstrate good metacognitive understanding in one area but not in others (Burns, 2020). Arguably, metacognitive abilities can be content and strategy dependent. Therefore children maybe able to display strong metacognitive skills in some areas but not others. However, some may suggest that children can utilise various strategies to help them across the curriculum (Cambridge Assessment International Education, unknown date). It is vital that children are aided in this process and shown that this is possible.

It has been argued that metacognition does not happen naturally in all learners. In terms of ability, some suggest that low achievers may need more support from practitioners, while high achievers often develop metacognition more effortlessly without any assistance from a practitioner (de Jager et al., 2015; Davidson, Deuser, & Sternberg 1995). In relation to this suggestion, challenge is integral in developing metacognitive skills. Furthermore, there is a suggestion that metacognition is best developed in situations that incur and stimulate careful and focused thinking (Flavell, 1979). It has been suggested that if children are not sufficiently challenged they would not develop their metacognitive strategies (Education

Endowment Foundation, unknown date). However, as a result of too much challenge, children could become cognitively overloaded. Some would suggest that differentiation and how teachers present activities and their level of challenge can also have an impact on the extent and the nature of the metacognition engaged in (McGregor, 2007). Thus highlighting how practitioners could take into account differentiated metacognitive strategies that will help all their learners achieve their full potential.

Approaches to developing metacognition

Metacognition, it could be suggested, is an area that has become increasingly popular within the classroom during recent years (Burns, 2020). It could be suggested that developments in recent research has had an impact upon this sudden increase in interest (Education Endowment Foundation, unknown date). However, due to the concept of metacognition being so broad and possessing no true universal definition, it could be argued that there lacks a common representation of metacognitive strategies used within the classroom setting (Pintrich, 2002). Also, some have even suggested that the inclusion of metacognitive strategies have been less than prioritised within many classrooms (Bransford, Brown, & Cocking, 2000; Hattie, 2008; Perry et al., 2019). Potentially this is due to the lack of clarity surrounding metacognition amongst practitioners. However, there are numerous factors such as the learning environment, pedagogical approaches, and the child's developmental stage that impact upon the development of metacognition (Larkin, 2010).

Some have argued that amongst teachers, it appears there is a visible absence of understanding of the term metacognition, which arguably results to misconceptions and sometimes poor implementation (Muijs and Bokhove, 2020). In an attempt to remedy this issue some have suggested that metacognition is most effective when there is a shared language about metacognitive strategies between pupils, peers and teachers (Pintrich, 2002; Welsh Assembly Government, 2010). Which could potentially suggest that language and terminology are key components when developing metacognition. This somewhat social-constructivist dialogue could aid children gain confidence in developing their metacognition through constructive discussion with their peers. However, one study highlighted how children struggled to discuss their metacognition as they had not been made aware of the vocabulary and invited to use it in a relevant and appropriate way (Holt and Tarrant, 2016).

This issue could potentially hinder children's interaction with their peers and teachers as they would not be able to engage in a purposeful and meaningful dialogue. Moreover, Howe (1997) highlighted how children struggle to apply generalised concepts to specific contexts. Thus highlighting the need for practitioners to ensure that children possess a solid understanding in terminology related to metacognition.

Some have suggested that even though there is much research highlighting the benefits of metacognitive strategies, there is less research upon how to utilise and apply them effectively (Education Endowment Foundation, unknown date). It has been argued that it is important that practitioners are supported in realising the value of metacognition (Leat and Higgins, 2002). It could be suggested that practitioners are reminded of the importance of developing children's thinking skills within the Welsh Teaching Standards (Welsh Government, 2020). Effective leadership arguably would ensure a combination of elements needed to foster strong metacognition within their school (Education Endowment Foundation, unknown date). These elements could include areas such as resources and mentoring to ensure that the development of metacognition is being prioritised within the school. There are suggestions that when utilising a shared terminology there could be a whole school approach to developing metacognition (Holt and Tarrant, 2016). Furthermore, whole school approaches to developing metacognition could include celebrating good practice and also having whole school focuses upon learning skills or dispositions (Holt and Tarrant, 2016).

The term metacognitive strategies can refer to children's understanding and awareness of their own knowledge, and control over their own cognitive processes (Weinstein & Mayer, 1986). Within the realm of metacognition, Flavell (1979) discussed the idea of strategy variables whereby individuals, through their metacognitive development, gain an understanding of which strategies would aid them in accomplishing a task. Some have indicated that children are able to utilise frameworks provided by their teacher in order to access their own individual understanding of their identities as learners (Dyer, 1995). However, some have suggested that strategies that teachers deploy to help aid children develop their metacognitive skills can be sometimes confusing (Burns, 2020). Arguably highlighting the need for teachers to gain a stronger understanding of what strategies would best suit their learners. One could suggest that metacognition can be developed at a very

minimal cost, which alongside the benefits of its development would appear desirable for schools (Perry et al., 2019).

Effective metacognitive teaching is integrated into lessons as opposed to an add on or forced element of teaching and learning experiences (Burns, 2020). This point is supported by the suggestion that metacognition should be embedded throughout and across the curriculum, as opposed to specific metacognition lessons and the learning should be made explicit (Perry et al., 2019). Furthermore, research has highlighted how the development of metacognitive skills has had a positive impact upon learners regardless of the subject being taught (Perry et al., 2019). Some may suggest that there is minimum evidence of the benefit of teaching metacognitive skills in individual metacognitive sessions based upon thinking skills and children may find it difficult to transfer generic ideas to specific activities (Education Endowment Foundation, unknown date). Thus, metacognitive skills should be utilised and embedded across a range of subjects. Moreover, some suggest that metacognitive understanding is content and context dependent and strongest when supported and made relevant to children and their world (Pramling, 1988; Robson, 2006).

Some suggest that metacognition is developed better when it is embedded into the daily life of the classroom (Holt and Tarrant, 2016). This could be done throughout various aspects such as classroom displays and word walls. Developing a vocabulary based upon talking about thinking can aid facilitate metacognition (McGuinness, 2005). Visual aids such as word walls or whiteboard materials demonstrating the vocabulary could also help aid children's metacognitive awareness (Welsh Assembly Government, 2010; McGuinness, 2005). These features could undoubtedly aid children in becoming more familiar with metacognitive terminology. Some have highlighted how important it is that children comprehend what the terminology means before it is displayed around the classroom thus ensuring it is purposeful and relevant (Holt and Tarrant, 2016). Hence the visual aids could help children become more confident in utilising and developing their metacognitive skills.

Metacognition has been referred to as a core component in higher-order thinking (Ku and Ho, 2010). Some primary schools utilise taxonomy questions to help develop children's thinking skills. There is a suggestion that utilising Bloom's taxonomy terminology can aid children develop their metacognition (Holt and Tarrant, 2016; Bloom, 1956). By utilising the

terminology children are encouraged to think and reflect upon their learning. However, it is integral that children have a shared understanding of what the terminology means before they are expected to use it (Holt and Tarrant, 2016). Using a metacognitive approach children could utilise Bloom's terminology by using a word in a context that is meaningful and beneficial to their thinking process. However, some suggest that it is a misconception that metacognition only represents 'higher order' thinking and is therefore more significant in teaching and learning experiences than cognition or subject knowledge (Education Endowment Foundation, unknown date).

It has been suggested that it is integral that children are provided with opportunities to talk and think about their learning in order to develop their metacognition (Bruner, 1960; Robson, 2006). Some have presented questions that teachers could utilise to help their children reflect upon their learning during activities (McGuinness, 2005). Thus potentially highlighting how questioning helps children to extend their thinking processes, hereby contributing to their metacognitive development. Further, opportunities to carry out dialogic talk may encourage or foster more effective metacognition (Alexander, 2004). Questioning and discussion some would argue are significant factors when developing metacognitive skills. Open-ended questions that prompt children into reflecting upon their processing could aid them to reflect more objectively and comprehend what was done and how it was done (McGregor, 2007). Becoming more reflective is a major component when developing metacognition. However, it should be noted that some have highlighted that it is important for not only teachers to ask children questions in order to develop metacognition, but children should be asking themselves or their peers questions thus enabling collaborative and meaningful exchange (McGregor, 2007).

In order for learners to become more metacognitive, learners should be enlightened about the concept and taught its language clearly (Tanner, 2017; Pintrich, 2002). As aforementioned, some would suggest that in order to maintain a constant development of metacognition, children should be questioned ensuring they are focusing on thinking about their thinking (Welsh Assembly Government, 2010). Practitioners could provide children with questions or prompts to help facilitate metacognition and the associated thinking processes (Tanner, 2017). This would aid and encourage students to think more clearly about their metacognition.

Throughout research there has been much debate surrounding the issue of which learning environments are best suited for the development of metacognition within children (de Jager et al., 2015). An essential feature of the development of metacognition is a classroom environment that encourages children to utilise and further explore their metacognitive skills (Cambridge Assessment International Education, unknown date). Arguably, establishing a learning environment that embeds metacognitive skills as part of their everyday practice is integral to children's learning process. It could be argued that practitioners have access to a broad range of strategies and classroom activities that aid metacognitive development. However, there is some concern over whether varying teaching and learning resources interpret and utilise metacognition in different ways (McGregor, 2007). Arguably, some would suggest that some practitioners have more access and understanding of metacognition than others.

One strategy that schools utilise in order to help children develop their metacognition is Thinking Hats (de Bono, 1992). Empirical evidence would suggest that Thinking Hats appear in many different school contexts. Moreover, in particular, de Bono's Blue Hat encourages children to think in a more metacognitive approach (McGregor, 2007). The Blue Hat encourages children to think about thinking and control their thinking process (de Bono, 1992). Hereby aiding children to focus upon a vital part of their metacognitive skills. Despite the Blue Hat primarily being the metacognitive hat, the other hats would arguably aid in the development of children's metacognitive skills. Thus, the rest of de Bono's Thinking Hats (1992) encourage children to reflect, organise and assess their learning. Thus, arguably contributing to children's well-rounded metacognitive development.

Impact of Metacognition

There are numerous benefits associated with the development of metacognition. It has been suggested that metacognitive practices can raise learners' abilities to transfer their learning to new contexts (Bransford, Brown, & Cocking, 2000). Possessing this ability will arguably allow children to become more autonomous and independent. Metacognition utilises the power of thinking, whereby the learner has some knowledge and understanding about their own thinking, monitors and regulates the course of their own thinking (Kluwe, 1982). These are all arguably major attributes to developing independent, well-rounded individuals. Some

suggest that metacognition benefits children as it can help them to articulate their thoughts and strategies thus enabling them to take action and potentially improve and achieve their full potential (Holt and Tarrant, 2016).

Metacognitive linguistic input is crucial for children's growing mental state understanding (Dunn et al., 1991). A point that has been well contested throughout this literature review. Socio-constructivist theorists have highlighted that children may come to process metacognitive knowledge by having collaborative conversations with knowledgeable others (Vygotsky, 1962). These knowledgeable others could be perceived as being either practitioners or peers. Specifically, conversations about thinking provides children with varying kinds of metacognitive input (Proust, 2010). In relation to socio-constructivist theories, group work could also be considered beneficial when developing children's metacognitive skills (Dignath, Büttner, and Langfeldt, 2008). Working collaboratively children could be developing their metacognitive skills either through discussion or dialogue, also through activities that have been carefully planned by practitioners.

In contrast, some would suggest that in order to develop motivation and hereby metacognition, children need to also work independently (Education Endowment Foundation, unknown date). Thus potentially suggesting that by working independently children sometimes overcome issues by themselves and acknowledge when they need to utilise suitable metacognitive strategies to aid them. It could be argued that children need to regulate their self-motivation in order to achieve their goals (Muijs and Bokhove, 2020). Hereby, contributing to them becoming well-achieving learners who successfully utilise their metacognitive skills. Kluwe (1982) highlighted how individual's have control over their own thinking, therefore, there is arguably a necessity for encouraging independence and developing self-agency in order to effectively develop metacognition. Many highlight how the practice and development of metacognitive skills can have huge benefits upon children's development (Nickerson et al., 1985). A meta-analysis of educational intervention impacts highlighted that metacognition is one of the most beneficial means of boosting learners' attainment (Hattie, 2008). Whilst some even suggested that metacognition accounts for nearly twenty percent of children's ability to be most successful at school (Veenman and Beishuizen, 2004). Arguably highlighting how important metacognition is and why it should be prioritised and encouraged within learners in the primary school setting.

It has been argued that learners who understand and are focused upon their own academic performance, have been taught sufficient skills of metacognition (Hattie, 2008). Thus highlighting how metacognition is significant in both raising achievement and aiding development. As a result of a meta-analysis there is a suggestion that metacognition can help children think more broadly and specifically about their own learning, and can potentially impact upon their educational progress by as much as eight months (Hattie, 2008; Higgins, 2014; Education Endowment Foundation, unknown date). Furthermore, evidence supporting the impact of metacognition highlights that children who apply metacognitive strategies to their activities often outperform those who do not apply them (Mason, Boldrin & Arias, 2010; Dignath & Büttner, 2008). Thus highlighting the impact that metacognition can have in raising standards and improving performance.

Importantly, there is research evidence that metacognition is a vital skill that is interconnected and somewhat central to various skills which includes problem solving, decision making, and critical thinking (Schraw, 1998; Hartman, 1998). Hereby, it could be suggested that this point highlights how important metacognition could be in developing well-rounded individuals. One of the four types of metacognitive learners are Strategic Learners (Perkins, 1992). Strategic learners aided by metacognition, can organise their thinking in various ways such as problem-solving, grouping and classifying, and decision-making and are aware of how they can apply the strategies that help them learn (Perkins, 1992). Furthermore, some researchers separate metacognitive knowledge from metacognitive skills (Afflerbach et al., 2016; Flavell, 1979). Metacognitive knowledge predominantly refers to the knowledge that an individual possesses about understanding of when and how to utilise strategies that would aid their learning in different contexts.

Some highlight the importance of reinforcement and repetition as they could aid children develop their metacognitive skills (Didau, 2015). It could be suggested that by children having opportunities to practice and utilise their metacognitive skills, it will aid their overall metacognitive development. Research has highlighted how instructional models and constructivist teaching approaches can be beneficial in the development of children's metacognition skills (de Jager et al., 2015). Furthermore, researchers highlight and emphasise the significance of children understanding how to use metacognitive strategies

(Butler, 2002; Schraw, 1998). There should arguably be emphasis placed upon how to use several strategies and integrating the strategies into useful and appropriate opportunities. Alongside the instruction of how use a range of several metacognitive strategies, children should gain understanding about how, when and why to utilise the strategies (Afflerbach, et al. 2006). Furthermore, it could be suggested that this would be an example of conditional knowledge whereby children possess knowledge of why and when to utilise a certain strategy (Schraw et al., 2006). Thus ultimately contributing to the development of their metacognition.

Approaches that support learners well-being can aid the development of their metacognition (Donaldson, 2015). Furthermore, children's mindsets can have an impact upon their metacognition. When students possess a growth mindset, they are able to examine their learning and modify their approach (Ambrose et al., 2010; Dweck, 2006). Moreover, children with growth mindsets are arguably more aware of feedback and can accurately assess their individual strengths and weaknesses. Empirical evidence would suggest most schools encourage children to adopt a Growth Mindset approach to their learning (Dweck, 2006). Possessing a Growth Mindset (Dweck, 2006) arguably aids children in their metacognitive development. Some suggest that children who have a positive Growth Mindset possess better self-motivation and self-regulation and are therefore more capable of metacognition. Hence, children who possess a Fixed Mindset could require assistance from a teacher or a peer to aid them develop a Growth Mindset and hereby develop their metacognitive skills.

Metacognition could be regarded as being an example of progressive education as opposed to traditionalist. Also, the new Welsh curriculum arguably takes this approach. A metacognitive approach can aid children to take ownership over their own learning (Bransford, Brown and Cocking, 2000). The new Welsh curriculum places a strong focus upon fostering independence (Donaldson, 2015). Metacognition is arguably important as it can underpin an individual's identity as a thinker and a learner (Desautel, 2009). With strong metacognitive skills children can arguably become more independent and focused learners. These points all arguably highlight how metacognition could help children to take greater ownership over their own learning.

Helping children develop their metacognition

Some suggest that it is significant for teachers to scaffold or model any metacognitive strategies (Burns, 2020; Didau, 2015). This may aid pupils to grasp a better understanding of developing their metacognitive skills and not exhaust their mental resources (Education Endowment Foundation, unknown date). Vygotsky (1962) developed the Zone of Proximal Development, a process which could be regarded as metacognitive development. The Zone of Proximal Development situates between what a child can achieve independently and what a child can attain with support (Vygotsky, 1962). A practitioner would initially take responsibility for metacognitive processes such as monitoring progress, setting goals and planning activities. Gradually, the responsibility of these processes are given to the learner, who then hopefully becomes increasingly able to regulate their own metacognitive activities.

Some have highlighted the value of appropriate adult intervention in which practitioners create both conditions and adequate time for reflection (Wood and Attfield, 2005). This would aid pupils in their development as reflection is a core component of metacognition. It is evident that teachers need to demonstrate to children how to regulate their metacognition before they are expected to attempt it independently (Schoenfeld, 2001; de Jager et al., 2015). Moreover, there is emerging evidence surrounding the significance of teachers demonstrating and role-modelling metacognition explicitly (Wall and Hall 2016; Butler, 2002). This suggestion could be done through teachers modelling and talking through their metacognitive processes. Again, arguably highlighting the need for use of scaffolding and other socio-cognitive approaches (Holt and Clark, 2016; Bruner, 1960). Arguably, this could lead to a significantly positive impact upon pupil's learning. However, it could be argued that teachers need to possess good metacognition themselves in order to nurture and develop these abilities within their students (McGregor, 2007; Larkin, 2010). Further, also suggesting that the teachers themselves need to be confident in their metacognitive abilities in order to help their children successfully develop their metacognition.

Some have suggested that children learn to develop their metacognitive skills effectively by observing their peers (Schraw, 1998). Arguably, children are better able to demonstrate and role-model metacognitive skills, whilst giving a rationale for these skills within their peers' Zone of Proximal Development, as opposed to teachers (Dignath & Büttner, 2008; Vygotsky, 1962). Some may suggest that their peers are sometimes more effective

models than teachers in some situations (Schunk, 1989; Meadows, 1993). Thus, potentially suggesting that children are on a similar learning continuum as their peers, who are arguably at the same point of their learning journey. Involving parents in their child's metacognitive development can also be beneficial (Holt and Tarrant, 2016). This could be done through home-learning tasks based upon developing metacognition to reward systems that would encourage children to talk about their metacognitive development at home.

Some have argued that the importance of metacognition has perhaps been moved into the background of initial teacher education and continuous professional development (Perry et al., 2019). This could arguably result in practitioners not feeling confident in developing metacognition within their classrooms. Hence, it is important that teachers are made more aware of the value of metacognition. When teachers are made more aware of metacognition, it could be an idea for teachers to share and discuss metacognition to their colleagues creating a positive culture (Holt and Tarrant, 2016). However, some would argue that due to additional pressures there is often limited time for teachers' professional development (McGregor, 2007). Moreover, some have argued that often teachers discuss and model their cognition without successfully modelling metacognition (Schraw, 1998). High quality professional development would demonstrate to teachers how development of metacognition should not be an additional activity that places additional pressure on to their workload but is inherent within the teaching and learning experiences they provide (Education Endowment Foundation, unknown date). However, some would unfortunately argue that metacognition is at risk of becoming undervalued and over conceptualised (Leat and Higgins, 2002). This could be remedied through more high quality professional development based on metacognition.

Practitioners should actively discuss the benefits of metacognitive strategies and explain to children how they can impact upon their learning (Cambridge Assessment International Education, unknown date). However, some suggest that when practitioners choose incorrect strategies to help children develop their metacognitive skills, it can be detrimental (Burns, 2020). Therefore, it is vital that practitioners help children utilise metacognitive strategies that are beneficial to their learning. It has been suggested that children with better metacognitive skills learn new information more accurately than students with weaker metacognitive skills (Concepción, 2004). Arguably, these points highlight how important it

is that practitioners understand their pupils strengths and weakness in regards to metacognition. Moreover, Bruer (1994) suggested that metacognitive skills are the ability to predict outcomes of one's own actions and to monitor and assess the results of one's own actions and progression. Some children may possess more metacognitive skill and abilities than others. Arguably, children differ in their ability to monitor and control their own learning progress (Education Endowment Foundation, unknown date). Herby again highlighting that practitioners need to ensure they aid their pupils' along their metacognitive development.

To resolvedly become capable learners, children need to be able understand their own process of learning, and recognise how they can be improved (Donaldson, 2015). In order to make a child metacognitively aware, there needs to be an assurance they have learned how to learn (Garner, 1987). Collaborating alongside both practitioners and peers can aid children to develop their metacognitive skills as the collaboration provides an opportunity to discuss their thinking and cognitive processes and refine their skills (Donaldson, 2015). Hereby, aiding children to become active participants in their own learning process and developing an understanding of how to learn in the best conditions that suits them individually (Donaldson, 2015). Arguably the objective of the new Welsh Curriculum is to aid children become capable learners and encouraging them to become more metacognitive can arguably only be beneficial in achieving this objective.

Practitioners should devote time for students to reflect and are provided with the correct equipment to do so (Cambridge Assessment International Education, unknown date). It is arguably essential that children are provided with time for self-reflection. Self-regulation is a major component within metacognition, which includes having the capability to control one's own learning to plan, monitor, and correct where appropriate (National Research Council, 2000). Many have highlighted the importance of children reflecting upon their learning and applying the results of the reflection in order to extend their learning (Welsh Assembly Government, 2010). Moreover, metacognition also could refer to the ability to reflect upon one's own performance (National Research Council, 2000; Flavell, 1979). Some have suggested that metacognition could be perceived as a strong predictor of academic performance (Veenman et al., 2014). Arguably, this point was supported by some who

suggested that children are very aware of their personal academic performance when taught relevant metacognitive skills (Hattie, 2008).

Allowing children to think independently and develop understanding through reflective interaction is significant when raising standards (Black and Wiliam, 1998). Whether this be during the lesson or after the commencement of activities through an Assessment for Learning strategy. There has been suggestion that there is a positive relationship between children's exposure to Assessment for Learning strategies and the use of metacognitive strategies (Baas et al, 2015). Moreover, the effective use of metacognitive strategies supports and extends the effectiveness of Assessment for Learning, thus resulting in accelerated learning (Baas et al, 2015). It could be suggested that when pupils are successfully taught how to learn, through metacognition, in harmony with formative assessment, there is potential for greater academic success (Perry et al., 2019). Metacognition is a major element of both developing thinking and Assessment for Learning and can undoubtedly extend learning (Welsh Assembly Government, 2010). Many would suggest that a metacognitive approach undoubtedly supports self-assessment (Holt and Tarrant, 2016). Assessment for Learning aids children to understand where they are in their learning, where they are going and how they will get there (Black and Wiliam, 1998). Quintessentially, this process draws parallels with metacognitive development.

It is suggested that practitioners should regularly query the effectiveness of their approaches and question the efficacy of the approaches (Weimer, 2012). It has been suggested that to allow time just at the end of the lesson for children to reflect upon their learning is not sufficient as adequate time has not been allowed for reflection (Larkin, 2010). Mini-plenaries that help children assess and monitor their progress can help children gain a better understanding of their own thinking process (Cambridge Assessment International Education, unknown date). Hence, practitioners should endeavour to provide appropriate time throughout the lesson to allow children to reflect upon their thinking. If practitioners embed metacognition as a continuous element of learning then action upon feedback, a central component of metacognition, is more immediate (Welsh Assembly Government, 2010).

Furthermore, children need a range of strategies to utilise to help them develop their metacognitive approach (Cambridge Assessment International Education, unknown date). As learners become more masterful in using metacognitive strategies, they hereby gain self-belief and growing in confidence, thereby becoming more independent as learners. Moreover, clear learning objectives can aid children to plan strategies that help them achieve goals and monitor progress (Cambridge Assessment International Education, unknown date). It is suggested that learning objectives including the metacognitive element need to be clearly explained to children (Veenman and Beishuizen, 2004). Some suggest it is imperative that teachers understand what thinking programmes, activities and pedagogy can aid metacognition (McGregor, 2007). More so, what specific metacognition programmes, resources and pedagogical approaches would aid their children.

Metacognition is arguably not possible without subject knowledge (Stringer and Quigley, 2018). Moreover, metacognition is often specific to the activity that is undertaken and more effective when children possess a strong understanding and subject knowledge (Education Endowment Foundation, unknown date). Furthermore, it is difficult to possess knowledge about how competent one is in a specific subject domain, without possessing strong subject knowledge (Pressley et al., 2006). This suggestion potentially highlights however effective a child's metacognitive abilities are without solid subject knowledge they will not develop their metacognition fully.

Moreover, metacognition involves thinking and reflecting continuously before, during and after a learning activity (Morin, 2014). To elaborate, before beginning an activity, planning is important, whilst during the activity metacognitive skills such as monitoring are necessary skills, then after the commencement of an activity evaluation and reflection are vital (de Jager et al., 2015). Thus highlighting how metacognition is an ongoing process that takes place throughout the duration of teaching and learning experiences. Thus again potentially highlight the three core components of metacognition which are planning, monitoring and evaluating (Education Endowment Foundation, unknown date). In agreement, some suggest that metacognitive skills are numerous and can be applied and utilised before, during and after teaching and learning experiences (Bereiter & Scardamalia, 1989).

Furthermore, it has been suggested that successful metacognition may not occur unless it is planned for and evaluated (Burns, 2020). Some would suggest that on a very simplistic level, metacognition involves three steps which are planning, monitoring and evaluating (Fogarty, 1994; Schraw, 1998). Arguably, these three steps could be easily planned for by practitioners and embedded into everyday practice. Approaches that are utilised within the classroom setting such as 'Plan-Do-Review', arguably are constructed to encourage children to develop their metacognition skills (May, 2013). Whilst approaches such as these are beneficial and can be applied generically, they are most effective when given context and purpose (Education, Endowment Foundation, unknown date). Schraw (1998) also discussed three elements of metacognitive strategies which are planning, monitoring, and evaluation. Whereby planning requires the selection of relevant metacognitive strategies, monitoring refers to monitoring one's performance and evaluating delegates the judgement about the accuracy of one's learning (Schraw 1998).

Some may argue that it is difficult to measure progress in children's development of their metacognitive skills (Perry et al., 2019). Moreover, some suggest that questioning a child on metacognition may result in receiving opinions based upon their interpretation of metacognition as opposed to the actual use of their metacognition during teaching and learning experiences (de Jager et al., 2015). Further, some highlight that there is no obvious assessed outcome nor is it easy to monitor progress in regards to metacognition (Larkin, 2010). As there is no universal framework for measuring progress in metacognition, this again poses difficulty for practitioners. Some have even suggested that metacognition may occur on a subconscious level, hence then children cannot discuss about it, even though they have acquired it (de Jager et al., 2015). Hence, supporting the idea that metacognition is a cognitive process, and therefore arguably internal, developed within children and thus being difficult to measure its usefulness.

Moreover, some researchers have suggested how metacognition is an internal process and therefore difficult to observe (Audet et al., 1996; Wall, 2008). Some would suggest that children's feedback, potentially through formative assessment, may aid practitioners in gaining understanding of their metacognitive progress. Despite this suggestion, some could argue that children sometimes overestimate or even underestimate their actual performance (Callender et al., 2014). Thus, not providing the teacher with an accurate idea of how well

the children have developed or progressed with regards to their metacognition. Moreover, classroom observations and utilising think aloud protocols could also aid practitioners in understanding how their children are progressing metacognitively (Education Endowment Foundation, unknown date).

Conclusion

In conclusion, metacognition could be regarded as being multifaceted and holding various definitions with connections to various epistemologically linked concepts. However, it is the author's personal belief that metacognition is highly beneficial for children's development. Some indicate that is evident that metacognition is a consistent feature in raising achievement and improves approaches and attitudes to learning (Leat and Lin, 2003; McGuiness, 2005). Therefore, metacognition could be regarded as beneficial for raising achievement and helping children become autonomous learners.

It has been highlighted that effective metacognitive learners self-evaluate, monitor learning, and utilise relevant strategies that assist them (Clark & Dumas, 2016; Zimmerman, 2001). These points, the author feels have been highlighted and explored throughout this literature review. Further, to conclude, in regards to the overarching aim of the literature review, metacognition can be a highly effective component for developing thinking and foster independence within the primary school setting. Throughout this literature review, the author endeavoured to discover seminal research based upon the area of metacognition with the aim to help develop personal professional practice. The teaching and learning of metacognitive skills, strategies and knowledge can potentially increase value across the curriculum (Perry et al., 2019). Hence why the author is now even more driven to ensure that metacognition is successfully developed within their classroom. After extensive research, the author concludes that metacognition needs to be thoughtfully developed in pupils into order to help them reach their full potential.

Some research has highlighted how teachers should ensure that the metacognition process is made clear within the classroom, this could be done through ensuring that the language of metacognition explicit, by modelling or scaffolding, and modelling good metacognitive skills (Wall and Hall, 2016). Some suggest that teachers should gain the professional abilities and skills required to aid develop their pupil's metacognitive skills (Education

Endowment Foundation, unknown date). Often professional development would aid this suggestion, however, some would suggest practitioners should take ownership and research the area of metacognition themselves as one's beliefs in the importance of metacognition could impact their ability to facilitate it in others (Larkin, 2010). Therefore an active research project based upon the topic of metacognition could also have been beneficial. To have carried out first-hand research using a mixed-method approach through utilising various research instruments could have been most insightful. The findings of the research could have been utilised to inform practice.

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