



UNIVERSITY OF  
CAMBRIDGE

*Faculty of Education*

*ISSN 2043-8338*

## *Journal of Trainee Teacher Education Research*

### **Pupil perspectives on uses of imagery as a cross-curricular aid to learning: the experiences of Year 5 children in a village school.**

**Marcus Nisbet**

(General Primary PGCE, 2014-15)

email: [mnisbet@mayfield.cambs.sch.uk](mailto:mnisbet@mayfield.cambs.sch.uk)

#### **Abstract**

*This study examines views of Year 5 pupils on the helpfulness of imagery in their learning, with reference to format and curricular use. The children surveyed demonstrated critical insight into their own learning and an ability to make discerning judgements. While differing in their views on what was helpful, all felt that imagery was capable of supporting or enhancing their learning. Some said that imagery could be counterproductive. Children attached particular importance to image use in mathematics, English and science, although other subjects were mentioned. Most had clear views as to suitability of format to subject, for example video as a demonstration tool in PE or diagrams in mathematics. Analysis of responses suggests that children apply, and can articulate, certain criteria in judging image helpfulness. These appear to encompass four basic groups, pertaining to accessibility, relevance, stimulus and*

*utility. However, how these are applied, and with what priority, varies.*

© Marcus Nisbet, 2016

# **Pupil perspectives on uses of imagery as a cross-curricular aid to learning: the experiences of Year 5 children in a village school.**

**Marcus Nisbet**

“A picture can tell a thousand words [...] it can help me to understand.”

(Sonja, aged 10)

## **Introduction**

This small-scale study reports on the views of young pupils on uses of imagery to support their learning. Research on imagery in classrooms has tended to be specialised, addressing image-rich areas of the curriculum, conventional visual tools and formats, new technologies and efforts to overcome learning barriers with images. A further body of research concerns the cognitive dimension of visual learning. Relatively few studies address the perceived merits of different uses of imagery to support children’s learning in primary school. Fewer still seek the views of pupils on such matters.

There may be good reasons. Learning preferences, including in respect of visual aids, belong to the individual. How can one make sense of all vagaries? This study investigates two questions. The first concerns how pupils view different uses of imagery, with reference to both *format* and *curricular use*. In particular, what is the balance of opinion? The second question concerns how pupils reach judgements about the helpfulness of an image in their own learning. What considerations matter most? Do pupils share certain concerns or apply similar standards when they judge helpfulness? Identifying common threads in pupils’ explanations might make it possible to develop criteria to inform teacher decisions about imagery. Attempts to arrive at such criteria must however take account of the reliability of pupils’ insights. This is considered further below.

The practice of seeking children’s views on aspects of their learning is well established. Following the adoption of the UN Convention on the Rights of the Child (1989, Article 12), in particular its provision for the child’s right to express views freely and be heard “in all matters affecting the child”, there has been an increasing interest in promoting ‘pupil voice’ in schools.

Alexander (2010) highlights children's capacity to form meaningful opinions about matters affecting their lives and emphasises the personal and educational value of children's sense of agency. While these benefits are widely recognised, realising them depends upon how research is carried out. This is examined below.

The participants in this study belonged to a Year 5 class of 22 children in a Community Primary School in the East of England. Their teacher made a priority of deploying images to support learning. She used a wide variety of visual formats, deploying them flexibly across the curriculum. The extent to which they functioned as the main object of contemplation also varied. A characteristic of her approach was to change the visual environment regularly to reflect the progression of children's learning. Her pupils' comments suggest that they had a very broad idea of what constitutes an image, usually including (but not being confined to) non-textual visual information. This study does not seek an exhaustive definition but starts with the general principle that images in the classroom may encompass all displayed information available in the course of learning that is not exclusively textual.

The following provides an overview of literature on image use in classrooms and sets out the ethical and practical considerations that influenced this study's conduct and design. Findings drawn from qualitative and quantitative data are presented and interpreted, highlighting significant emerging themes, together with the factors limiting the scope for generalisable conclusions. The implications of this study for my own professional practice are also considered.

## **Existing research**

While the majority of classroom learning is mediated through spoken or written language, images have long been recognised as playing an important role in the development of understanding. A common thread running through research on visual learning is the principle that, in order to support cognitive development, images must also support the word.

Vygotsky, Piaget and Bruner all consider the relationship between image and language in cognitive development. Vygotsky (1978) sees the child's visual perception of the world as being mediated through language. He considers speech and visual information to be distinct yet interlinked, with objects and colour acquiring meaning as categorised perceptions. This is similar to Piaget's (1964) mental schemas in which perceptions gain meaning through assimilation into a conceptual

framework. Piaget also notes the complementary relationship between mental images and concepts, the former never replacing the latter but functioning in an auxiliary capacity to the concepts that language represents (1974). Like Bruner, Olver and Greenfield et al. (1966), who propose a visual or iconic phase in cognitive growth that precedes the use of symbolic systems, Piaget (1956) sees images as playing “an increasingly subordinate role” (p.456) as language-based thought systems become more organised.

For all the above thinkers, sensory perceptions are integral to a constructivist view of learning, providing information that supports the development of concepts in conjunction with symbolic systems such as language. As Nodelman (1998) notes, “all perception, [...] including the perception of pictures, might actually be an act of verbalisation” (p.8). Klausmeier and Allen (1978) report on the independent acquisition of verbal and nonverbal systems by the memory, arguing that this makes it possible to process images whilst listening to speech (as in film-viewing). Independence of, and qualitative differences between, the two systems enable the brain to process visual and verbal information efficiently.

Hattie and Yates (2014) identify vision as central to our learning: “we all learn well when the inputs we experience are multi-modal or conveyed through different media”. Moreover, “strong learning occurs when words or images are combined” (p.115). Recognising that efficiency is a factor, they set out principles concerning cognitive load. These highlight the educational value of images and words that are closely linked and that are unencumbered by extraneous information. Modality is also key, as combined auditory and visual learning is found to be superior to reading text while studying an image.

Research on image use in the general school environment has tended to approach the subject from specialised angles or else by examining it as a cultural phenomenon. Ethnographic research on displays (Thomson, Hall, & Russell, 2007) illustrates their celebratory, aesthetic and representational functions. Research that examines displays as instruments of learning shows that opportunities for cognitive development are not always exploited and identifies a mismatch between children’s and teachers’ views (Pointon & Kershner 2000; Pointon, 2000). Cooper, Hegarty, Hegarty and Simco (1996) also identify differences between pupil response and teacher intention. Critically assessing five common approaches to display, they advocate a constructivist

approach that makes display integral to classroom learning. Such explicit links between theory and practice are rare, however.

Posters are another traditional feature of the classroom. In a study of Turkish primary school children learning English, Cetin and Flamand (2013) found that posters containing visual prompts were effective in enhancing pupils' vocabulary compared with a control group. They theorise that matching pictures to words removes the cognitive burden associated with translating between texts. Interestingly, they conclude that the mere presence of posters has the effect of encouraging pupils to take an interest in their surroundings and, indirectly, of prompting self-directed learning. Hubenthal, O'Brien and Taber (2011) propose a model for science posters that foster cognition in the classroom. They set out criteria for engaging learners but present little supporting evidence.

The advent of the Interactive White Board (IWB) prompted a raft of research (in particular Wall, Higgins and Smith, (2005)), including of primary pupils' perceptions. The versatility and prominence of the IWB make it of particular interest. A notable, if unsurprising, conclusion is that pupils most commonly associate the IWB with visual learning. In particular, children identified a complementary relationship between this and the verbal elements of their learning that they found helpful. This supports Hattie and Yates's conclusion (above) on strong learning. A further finding is the improved visibility afforded by the IWB.

Subject-specific advantages were also noted, in particular in respect of spatial aspects of mathematics and the demonstration of processes in science. The study identifies a clear relationship between the IWB and pupils' views of learning, emphasising visual and verbal-social elements and the use of colour and movement.

Research on use of illustrated texts is extensive, although much is focused on older learners. Among children there is evidence that less successful learners access image content more frequently, although the relationship between this and text-reading ability appears to be complex (Reid & Beveridge, 1990). Video can have benefits for the acquisition of novel scientific vocabulary, perhaps in part because children find the format enjoyable (White, Easton, & Anderson, 2000). Images are also known to support young non-English-speaking children in learning English vocabulary with computers, especially dynamic and complex rather than static images (Chang, Lin, & Lee, 2005).

By early in primary school, children are able to identify and explain a causal link between their sensory experiences and knowledge they have acquired, beginning with visual experiences at around the age of 3 (O'Neill, Astington, & Flavell, 1992). This modality-related knowledge has become well-established by the age of 6, indicating the potential for accurate reflection on some aspects of knowledge acquisition, especially visual and tactile learning. By later in primary school, it would appear that the capacity for reflection on knowledge acquisition has reached a sophisticated level.

Cooper and McIntyre (1996a) find that Year 7 pupils reported use of pictures and other visual stimuli as leading to desired outcomes. They also explore pupil perspectives on their own “craft knowledge” (1996b, p.155). Their evidence suggests that pupils’ “metacognitive knowledge” (Flavell, 1979, p.906) is impressive and offers insights into visual learning. Of particular note is the role of visual stimuli in providing a framework in which children are able “imaginatively to reinstate information”. This involves an active process of transformation on the part of pupils. Cooper and McIntyre conclude that the value of visual representation in cognitive development is linked not only to stimuli material but also to what children consciously do with it to extend their learning. McCallum, Hargreaves and Gipps (2000) note the value to primary school children of visualising as a means of achieving understanding and of supporting recall. This study seeks to build upon the above findings by considering how children judge *different* uses of imagery in class.

## Methodology

A priority of this study was to obtain such views through a variety of routes, not only for triangulation purposes but also to limit distortions and drawbacks connected with single methodologies. MacBeath, Demetriou, Rudduck and Myers (2003) highlight the advantages of accuracy and systematic recording offered by written questionnaires. However they also recognise the tendency of children’s responses to lack depth and the difficulty of obtaining topic coverage. This study therefore combined semi-structured, recorded interviews based upon a schedule of open questions with a written questionnaire. A further priority concerned scope. Format and curricular use were selected as the dimensions that had the most relevance to primary classrooms. While image content might shed light on pupil responses, it represents a complex field that merits dedicated analysis.

In seeking pupil views one must consider children's limited capacity for self-expression and tendency to respond in ways intended to please the researcher, particularly in individual interviews (MacBeath et al. 2003). This study used group interviews to address this, providing for discussion in which children could interact using a language that they understood. The adult researcher had to prompt discussion and seek clarification whilst maintaining equity, order and focus. At the same time, the interviews had to be flexible, accommodating the children's wishes as far as possible. Participants chose for example to give their views in their agreed order for each question. This avoided pressurising one child to 'go first' and reduced the creeping fear associated with table-rounds. The approach perhaps reflects Davis's (1998) observation, that "throughout the research process the researcher's ethics, roles and tools will be put under strain, questioned and renegotiated" (p.329).

While noting the pitfalls of group formats, Thomas (2009, pp.164-8) highlights the value of combining structured coverage of issues with the freedom to explore through discussion. In this study children could listen to one another and were given as much time as they needed to consider their replies. They were encouraged to think freely, and non-responses were explicitly noted as valid. In order to help children prepare, they were invited to think firstly about an image or object at home that was significant or that they liked and then to do the same in respect of one that they had encountered in school. Occasionally, where necessary, the children were reminded of examples of image use that had featured in their learning. It was notable that quieter participants contributed significantly more as the interview progressed. The interviews, with four and then five children, lasted approximately forty-five and eighty minutes respectively. The different durations reflect not just participant numbers: they highlight a risk connected with discussion, which is that individuals can dominate (ibid; MacBeath et al., 2003). In the case of the second group I had to ensure that all children could have their say whilst enabling a highly vocal member to function as a catalyst.

The outputs of the interviews consisted of qualitative and quantitative data. Codes were used to record the frequency of positive, negative and neutral statements with reference to image format and curricular use. The results were aggregated and tabulated for analysis (Appendix 1). Assessing whether a statement was positive or otherwise required interpretation. Further results were obtained by recording the frequency of keywords, phrases or equivalents that captured reasons and justifications. These were selected on the grounds of frequency.



Testing these findings called for a methodological triangulation (Denzin, 1984). Twenty-one pupils, including those already interviewed, completed the questionnaire (the other being absent). All provided further opinions in response to a series of rating scales. Munn and Drever (1999) and MacBeath et al., (2003) emphasise the importance of making questions accessible. The questionnaire contained five items framed as open questions, allowing freedom to express information in ways that suited individuals.

The spread of academic ability among participants called for an easily comprehensible questionnaire with a manageable number of questions. All children responded, with some including “don’t know” responses and one requiring help to read and interpret the questions. The same children were asked to rate the uses of seven visual formats that appeared most frequently in their learning with the opportunity to add further information.

## **Ethics**

Davis (1998) suggests that the ethics of children’s research can be divided into three groups: informed consent, confidentiality and protection. The following summarises how I addressed these. The study was undertaken in compliance with the Ethical Guidelines for Research published by the British Educational Research Association (2011). It proceeded with the permission of the class teacher and the school’s head teacher, whose consent was sought in writing with a supporting letter outlining the scope and purpose of the research and the process of data-gathering. The head teacher gave permission to seek the consent of participants’ parents/carers to the audio recording of their children’s views. This request, made by letter, included an undertaking to destroy recorded material by the end of the 2014/15 academic year and to ensure that any views cited would be made anonymous. Nine families returned signed slips granting consent to record.

All nine children taking part in the interviews gave voluntary, informed consent to participate and be recorded. They had firstly been told of the purpose of the research and what their participation would involve. They were also reassured that their views would remain anonymous, that the audio recordings would be heard only by the researcher and that recordings and accompanying notes would be destroyed as set out above. It was emphasised to the children that there could be “no right or wrong answers” and that the value of the exercise lay in gathering opinions.

Kellett (2005) suggests that “informed consent which is ethically obtained does not involve any element of coercion on the part of the researcher” (p.33). This should mean attending to the risk of *unintended* coercion arising from the perceived authority of the researcher. Thomas (2009), Kellett (2005) and Morrow and Richards (1996) highlight the unequal relationship that exists between researcher and child. In the present study this inequality risked being exacerbated by the fact that the researcher also had responsibility for teaching the class (and was therefore in an existing position of authority). Inadvertently reinforcing perceptions of authority carried the risk of inhibiting participants. There was a further risk that children might feel pressurised to provide the answers that they believed the teacher-researcher wished to hear (although the reverse might be argued). These complexities raised design as well as ethical questions for this study. Making explicit to participants their right to withdraw consent was therefore essential on both counts, as was the process of making them feel at ease before the interviews. This influenced the design of the research questions, as noted above. Children were also invited to ask questions at any time.

## **Findings**

### **General findings**

In interview pupils expressed a wide range of views on the helpfulness or otherwise of image use in their learning (summarised in Appendix 1). These related to images in general, image formats and the curricular uses of images (specified as subjects). Statements were coded according to whether they reflected a positive, neutral or negative view and reasons were noted where available. Table 1 reflects a high frequency of positive statements (68.3%) concerning image use and significantly lower frequencies of negative and neutral statements (28.9% and 2.8% respectively). Pupils were generally more willing to offer reasons for their views in respect of negative statements than positive or neutral statements. The most significant item on which students stated a view was image format (52.1%), and the item attracting the least comment was curricular use (18.3%).

The reasons given for positive views fell broadly into two categories comprising general utility and personal impact (for example giving aesthetic pleasure). The first of these categories accounted for twice as many positive views as the second. As Evan remarks: “When you’ve got the picture it can help, because you’ve got something to use”.

	Positive statement	Negative statement	Neutral statement	Total
Images in general	21 (14.8%)	19 (13.4%)	2 (1.4%)	<b>42 (29.6%)</b>
Image formats	58 (40.8%)	14 (9.9%)	2 (1.4%)	<b>74 (52.1%)</b>
Curricular uses	18 (12.7%)	8 (5.6%)	0 (0%)	<b>26 (18.3%)</b>
<b>Total</b>	<b>97 (68.3%)</b>	<b>41 (28.9%)</b>	<b>4 (2.8%)</b>	<b>142 (100%)</b>

**Table 1: Frequency of statements made during interview**

The most frequently cited reasons for the utility of an image were that it helped with learning or understanding, that it assisted recall and that it provided context. Sally: “When someone says something to me I don’t really get it, but if it’s done as a picture I really understand it and it just makes so much more sense”. Anna agrees: “With an image you can get a proper sense of something”. Hattie, like a number of children, emphasised her need to understand the learning objective, and valued the contextual value of images: “You could see from the background what we were predicting about.”

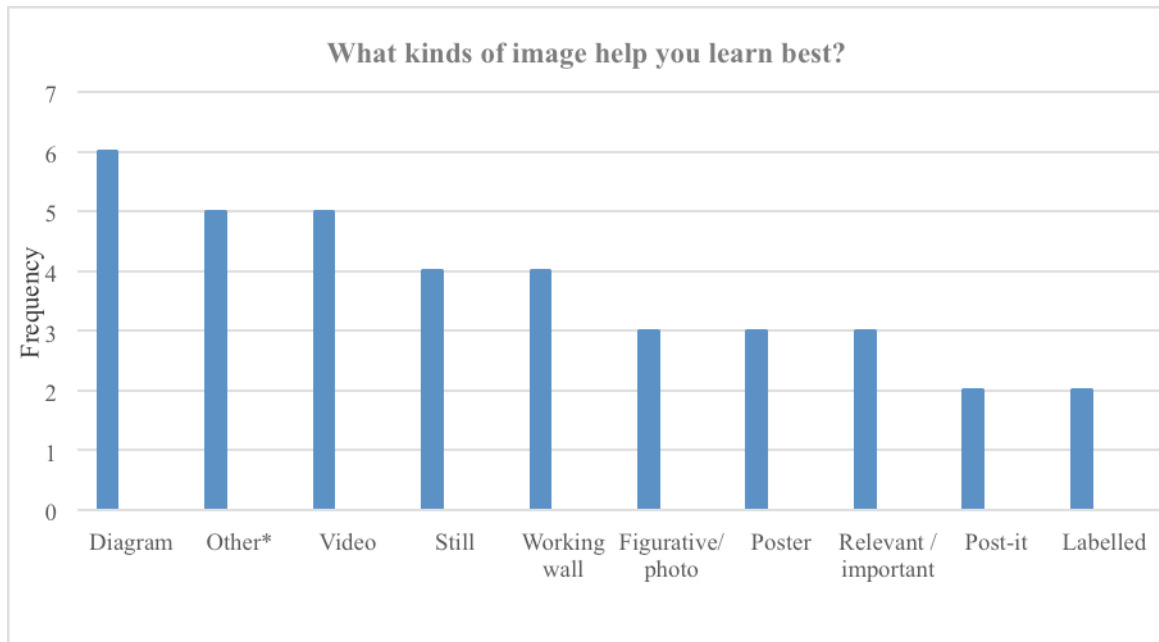
The most significant reason given for an image making a personal impact was that it was inspiring or stimulating. For the children this took various forms, but a common theme was the notion of forward-thinking.

Negative statements fell into three categories, namely distraction or disruption effects, confusion and no benefit. Of these, the first two were of roughly equal concern and the third much less significant. Children were highly aware of the potential of images to divert them from task. Kershner and Pointon (2000) find that, while many pupils find displays beneficial to learning, some find them distracting. Extraneous detail was agreed by respondents to be a common cause of distraction. The word “distract” was used very frequently, together with words such as “hypnotising”, “dazed”, “hungry”, “thirsty”, “inappropriate”, “weird” and “daydreaming”. Many of these expressions relate to extrinsic factors beyond teacher control. However, one child in this study argued that an image can be “a good distraction”. Children’s comments suggest that the timing of image use can affect pupil reaction and cause reinterpretation. This can be stimulating or in some cases disruptive, as Sally remarks: “Sometimes it can make you want to start again.”

In summary, the general view emerging from the evidence is that children consult images in their learning with two fundamental purposes: to help them understand and to find stimulus. In the case of the first, participants identified ancillary benefits. These included supporting memory, providing continuity, clarifying the learning objective and demonstrating an idea or process. In considering the value of visual stimuli, children were generally very aware of the impact that an image had upon themselves, be it cognitive or affective. Such impacts might be classified as inspiration and inquiry, social and emotional gratification and aesthetic pleasure. Only the first of these appeared to be closely tied to active learning. This is reflected in the much larger number of comments made about it and is consistent with children's ability to identify what they find helpful. The views for which pupils provided reasons related to standard categories of format and application. They do not necessarily illustrate how pupils form judgements in individual cases. The factors influencing how these are reached might well differ from those expressed in interview and are perhaps less apparent to pupils themselves. This is considered further below.

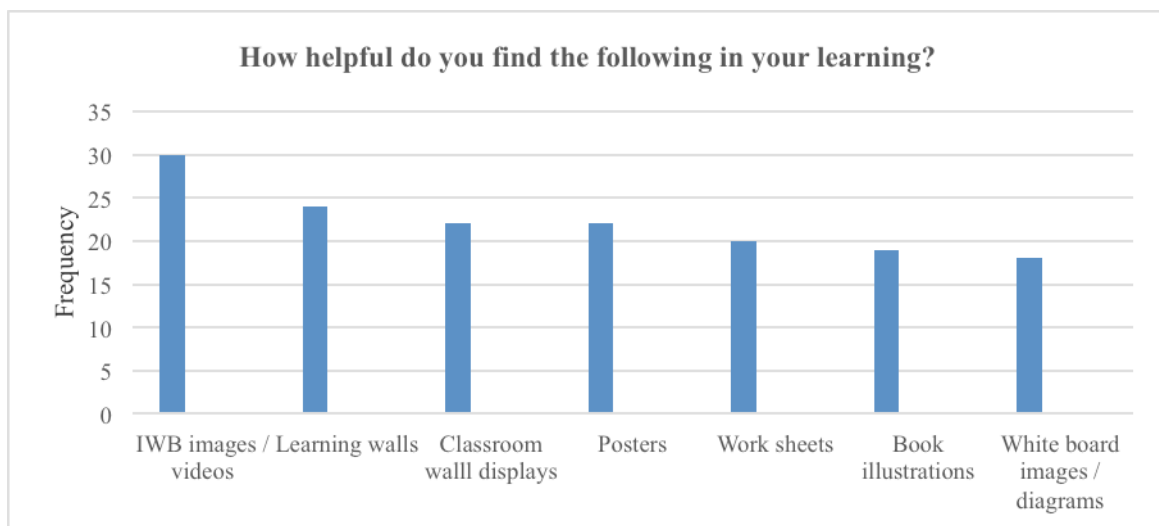
## **Format**

A further factor not reflected in the above data is the depth of feeling expressed by pupils on particular uses of imagery. This was sought through rating scales relating to format (the most significant item of interest) and its main manifestations in class. Pupils also provided views on format through the questionnaire. In interview the items that attracted the most comment were, in descending order of frequency, diagrams, the Interactive White Board (IWB), working walls (sections of wall used to record key elements of current learning, referred to as 'learning walls' in this class), displays and cartoons. Of these, the balance of positive statements was greatest for diagrams, learning walls and displays. This is broadly consistent with data obtained through the questionnaire on image format, where categories were supplied by pupils in response to the question: "what kinds of image help you learn best?" (Figure 1). Though limited, these responses give a relatively high value to video-based learning. Interview results for video use however were less clear-cut and revealed concerns about the difficulty of recording useful information during and after viewing time. Weighted rating scale values (Figure 2) place the IWB, learning walls, displays and posters ahead of other formats. A breakdown of the same results (Figure 3) suggests that opinion is least equivocal over IWB images (static and dynamic).

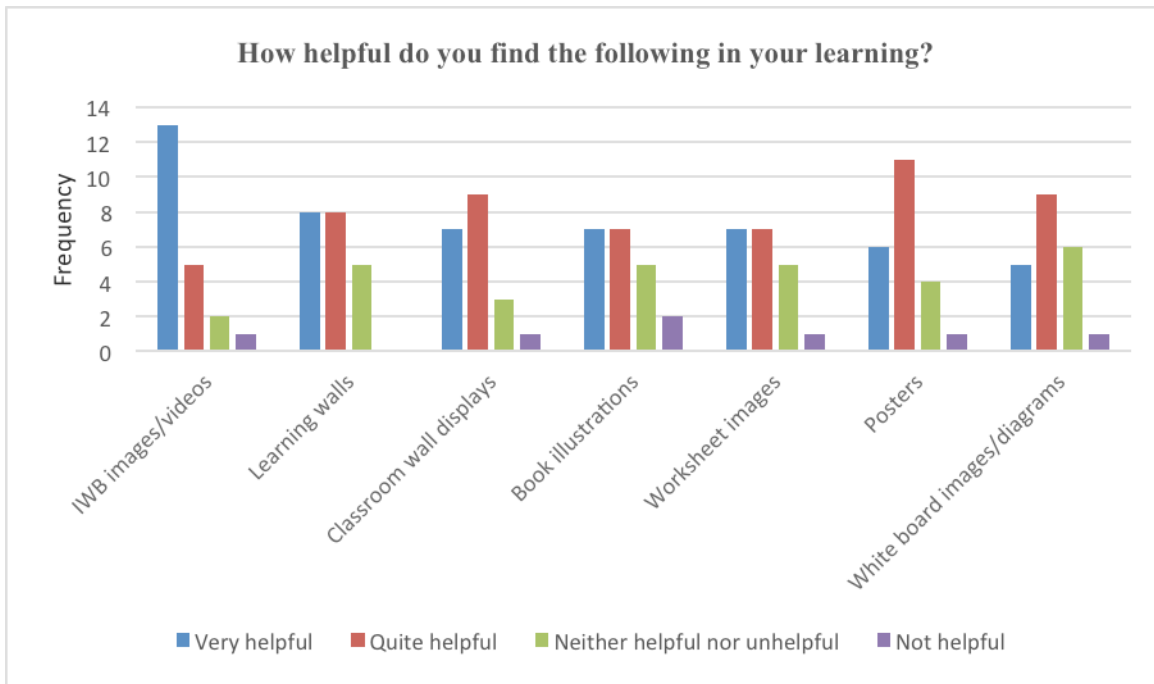


*\*Objects/3D; IWB still image; coloured image; visual instructions; number line*

**Figure 1: Image formats (pupils' descriptors)**



**Figure 2: Image formats (weighted scores)**



**Figure 3: Image formats**

All interviewees found diagrams helpful, particularly in certain curricular areas. Their virtues appear to include explanatory value (if labelled), simplicity and power to communicate ideas efficiently. Zara and Hattie spoke of using diagrams at home as well as in school (representing the human body and ox-bow lakes). Sally, a dyslexic child, mentioned the helpfulness of mind maps combining diagrammatic with pictorial elements. She uses her own images to do the work of language. “I use a mind map, and that really helps me, because I can actually see.”

Most children remarked on the power of diagrams to scaffold their understanding (perhaps on account of their analytical nature). This view of diagrams as cognitive tools does not sit readily with David and Tomaz’s (2012) conclusion that mathematical diagrams are not just objects of children’s learning but have the potential to redirect the process and become “subjects” of an activity.

The perceived effectiveness of diagrams appeared to depend on certain variables, such as clarity and simplicity. This highlights a further finding, namely the capacity of children to account for different factors in their judgements (both prospective judgements of likely helpfulness and retrospective judgements of learner experience). In interview the factors that emerged as being most important were task relevance, usefulness, personal impact and clarity, or ease of use.

Participants generally enjoyed videos and saw them as a useful instrument of learning, especially where dynamic imagery was directly relevant to an idea or procedure. In other areas of learning videos were seen as a potential obstacle, particularly where children were expected to take written notes while absorbing information derived from video. The difficulties they reported in juggling the two tasks (and desire to pause the video at critical moments) suggests that, while video can be an efficient and engaging form of visual learning, it can aggravate cognitive load if not managed carefully. In a reversal of the presumed relationship, some children judged video's effectiveness by how well the images were supported by words (spoken or written). In other words, in a predominantly visual medium, language played a subordinate but critical role. When comparing dynamic and static images generally, children stated a clear preference for the latter, irrespective of context.

There was no strong feeling about the value of illustrated books. This may be linked to issues of accessibility. Formats generally favoured by the children tended to be highly visible (IWB and learning walls) or easily read (such as mathematics diagrams) or a combination of the two. The class had good access to illustrated books, but these were rarely deployed as direct supports to classroom learning, being instead confined to library visits or book corner. While children evidently enjoyed these facilities and made frequent use of illustrated books, the desirability of images in their reading varied from individual to individual.

Interviews revealed strong agreement that images used in combination with words (Figure 4) helped children most in their learning, confirming the evidence from cognitive psychology outlined above. Millie observes: "you could be drawing something like ... squiggly and that no one knows about, but labels say what it is". Similarly, Anna: "I think that posters are very helpful, because, not only do they have writing, but they have images to go with the writing."

This was not without risks, however. The conceptual alignment of image and text, the clarity of the latter and task relevance were all felt to affect children's judgements about helpfulness. A further dimension of format warrants mention, namely legibility. The second interview group expressed strong views on the need for good print quality (black and white being judged less helpful), a clear font (Comic Sans and Arial being favoured) and careful use of colour for print and background (red print on white being judged the least helpful combination). Some commented that a light typeface on dark a background was more legible.



**Figure 4: A concept cartoon (author's own work) used by the class in a science lesson on changes of state, illustrating how words can be combined with simple images in an accessible format to stimulate dialogue.**

### **Curricular use**

In both interview and the written questionnaire (Figure 5), pupils considered images to be most helpful in the traditional core subjects of English, mathematics and science, with only the last of these three attracting no negative comments. Freddie identifies a motivational factor: "science [...] would be incredibly boring if we didn't have objects [...] because it would just be writing out predictions".

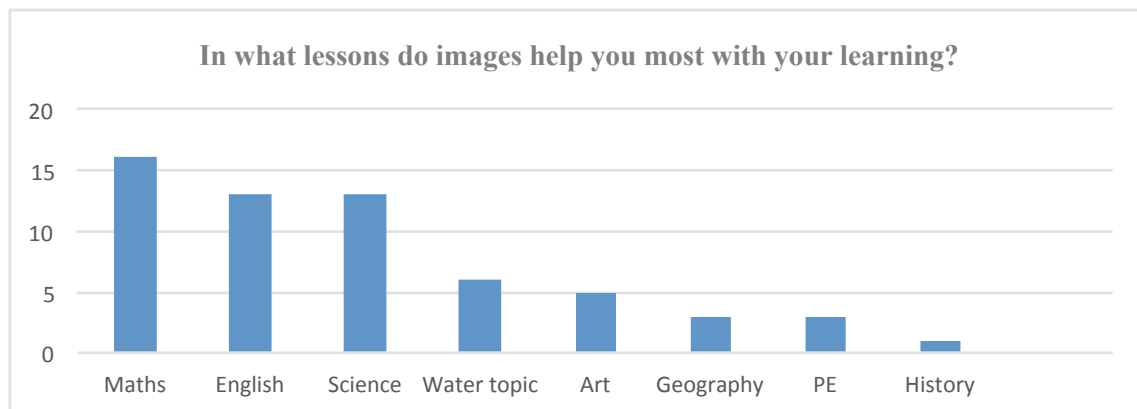
Mathematics attracted the strongest views. While there was a strong consensus on the value of diagrams in elucidating concepts (pie charts in particular), some pupils found real pictures less helpful. In particular, children reported that the use of familiar images such as cakes and pizzas to demonstrate mathematical concepts could engage their interest but end up distracting them with thoughts of food. Some image formats specific to mathematics, such as the empty number line (a form of model), were found to be useful and motivating: "It makes you want to think, "What could I do next?" (Evan)

Two children contrasted the use of diagrams in mathematics with studying pictures in English, as Sonja explains: "I find in mathematics ... I find diagrams more helpful than pictures (just pictures), so if they're marked out it's easier to see what you're looking at."



While in mathematics she sees diagrams as clarifying, in English they stimulate thinking: “We were writing stories about the monsoons, then we looked at a picture [...] and it kind of made me think a bit more, so that was quite helpful ... about the monsoons and what actually happens.” This is similar to Anna’s perception that: “Pictures can be helpful if you’re starting to write [...]. In mathematics it’s helpful if you have a diagram ... then you can see what’s going on instead of a load of numbers jumping up in your face.”

PE was held to be the most helpful application of video-based learning, for understandable reasons. Speaking of this subject, Evan remarks: “if we just see a picture, or ... explaining it ...you just can’t quite understand it properly, as you can in watching a video.” But these concerns overlook the value of image uses that are specific to the requirements of different disciplines. Probing of children’s views in interview helped to expose the subject-specific benefits described above.



**Figure 5: Curricular areas**

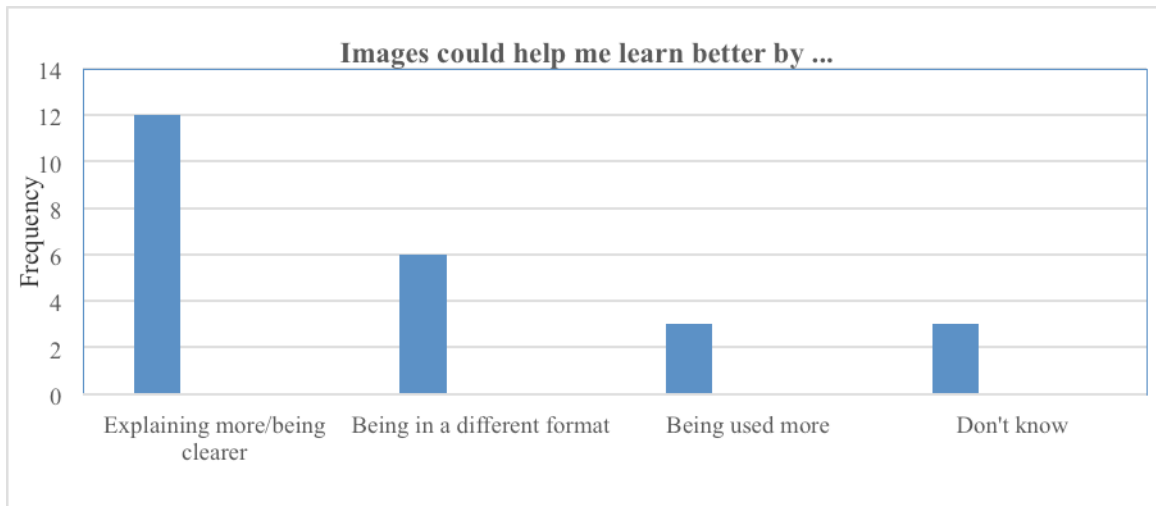
Children’s identification of mathematics, English and science as the most important areas in which image use helped their learning could simply be a measure of the number of hours spent on them in class. Children’s views may also be biased towards recent experiences, such as the current topic of water (Figure 6), contrasting with low ratings for history, which had been taught the previous term.



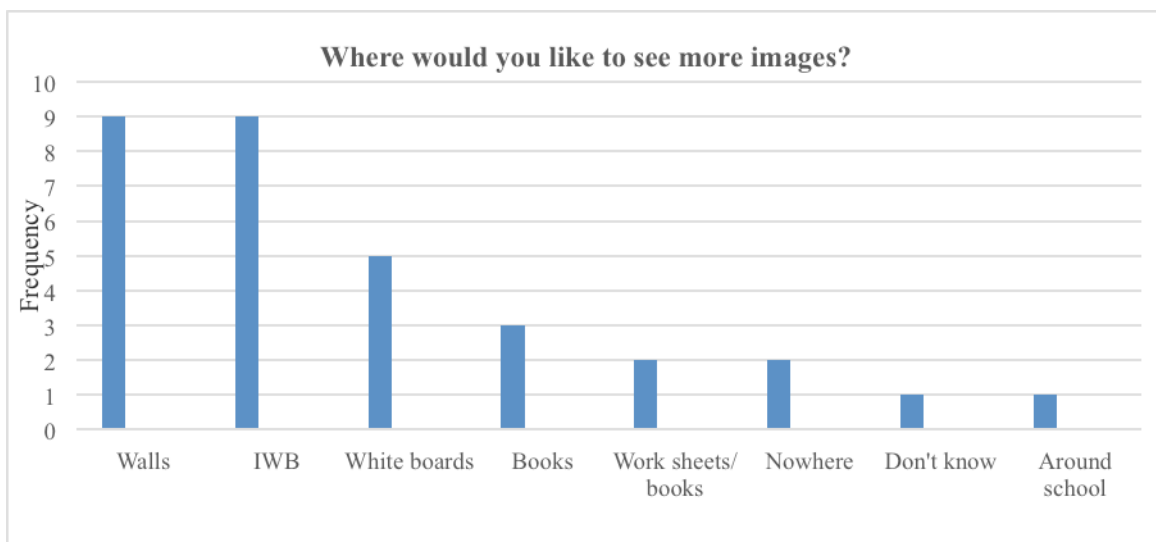
**Figure 6: A kinetic display in the reading corner on the topic of water (author's own work).**

## **Improvements**

How children felt that their learning could be improved by imagery was the subject of further questions in the written survey. The responses (Figure 7) suggest that prevalence was significantly less important to the children than utility and clarity. When asked where images should be used more, children identified the walls and IWB as the main areas, followed by the white boards (Figure 8). This supports the view advanced above that visibility and accessibility are of particular interest to the children. It might however be argued that these are the areas where children are most accustomed to looking for information, making convenience a possible reason. The most common argument for reducing image use (Figure 9) related to curriculum, although there were no clear trends.

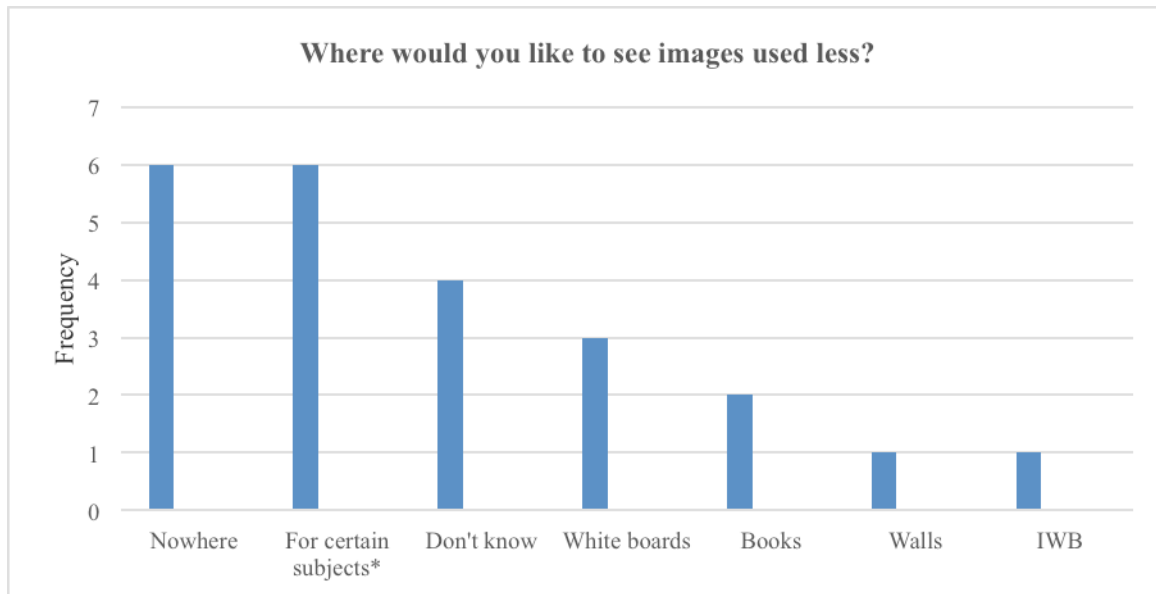


**Figure 7: How images could improve learning**



*\*subjects specified: English, mathematics, history, PSHE, RE*

**Figure 8: Locations (increased use)**



\*Subjects specified: English, mathematics, history, PSHE, RE

**Figure 9: Locations (reduced use)**

## Discussion

While the small number of participants may limit the scope for generalisable conclusions (Thomas, 2009), the study's concentrated focus provided for depth of discussion and the probing of ideas. The group discussions undertaken tended to have a selective focus and were influenced by a social dynamic. In particular, force of personality might have developed consensus where one-to-one interviews would not. On the other hand, some individuals generated momentum, enabling children to contribute freely with ideas that might otherwise have remained unexplored.

Clear themes emerged from the study that warrant closer analysis. Perhaps most conspicuous, if unsurprising, is the importance participants attached to visual learning. It is apparent in virtually any classroom that children observe as well as listen to their teacher. Young learners thus study images even when no formal image is present before them. Mehrabian's conclusion (1972) that, in communication, our intake of information is based upon 7% words, 38% voice and 55% body language raises the question of whether children's recourse to visual aids is instinctive rather than deliberate. What is perhaps more remarkable however is children's capacity by late primary to reflect on their use of images with insight. Kershner and Pointon (2000) observe children's ability to discriminate between displays, a finding consistent with the views children expressed in the

present study. These observations argue for further inquiry into children's strategies in image use at this stage in their education.

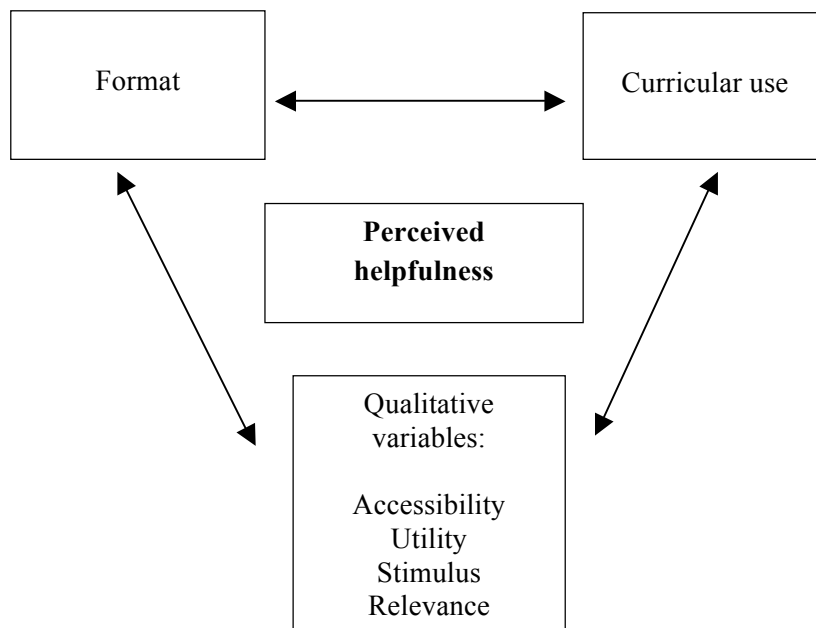
Children's apparent skill in judging the helpfulness of an image implies a desire to learn efficiently. As Nodelman (1988) observes, "we do not seem to have to learn how to understand at least some of the information conveyed by pictures as we do need to learn to interpret the verbal and visual signs of words" (p.6). Pictures can represent both a short-cut in children's learning and, potentially, a barrier. The views expressed by children reveal an acute sense of when an image represents one or the other. Such discernment implies that they make conscious or subconscious value judgements. This raises the question of what criteria children might use. In order to pursue this question, the reasons (positive or negative) that participants provided for finding an image helpful or unhelpful were recorded using codes. They were subsequently interpreted to identify common threads. As a first step, recurrent keywords and their variables were identified, such as "clear", "relevant", "inspiring", "interesting", "imagine", "helpful", "understand", "shows", "explains", "distracts", "confusing", "nice", "exciting", "remember" and "use". Phrases or sentences of similar meaning were also recorded and all were organised into the smallest possible number of semantic groups. Frequencies were recorded.

The results of this analysis (Table 2) suggest that there may be four fundamental areas of interest to the children when considering the helpfulness of images (the precise number of categories is debatable). These areas might be characterised as qualitative variables that children consider in conjunction with image format and curricular use. It should be emphasised that these variables represent subjective scales of value on which optima rather than maxima may be sought. They are: *utility* ('How can I use this image to further my learning, and how much is it helping me?'); *accessibility* ('How easy is it to see and to read this image and how much sense does it make?'); *stimulus* ('Do I find this image inspiring, exciting, fun, thought-provoking, confusing, off-putting, etc?'); and *relevance* ('How does this image align with my learning and support the objective I am pursuing?'). Figure 10 illustrates the relationship.

For reasons given above, it is unlikely that much weight can be attached to the relative scorings for the four variables identified. What is significant is the variables themselves, and further research might seek to establish whether similar variables emerge in studying a much larger group of children.

	Accessibility	Utility	Stimulus	Relevance
Interview 1	9	15	9	2
Interview 2	32	19	19	16
<b>Total</b>	<b>41</b>	<b>34</b>	<b>28</b>	<b>18</b>

**Table 2: Interpretative analysis of qualitative variables influencing pupil judgements**



**Figure 10: Analysis of pupils' critical framework in respect of variables considered during this study**

## Implications for future practice

Primary children's capacity to reflect constructively on their learning (McIntyre, Pedder, & Rudduck, 2005) makes them potential assets in planning an effective learning environment. This study has demonstrated the desirability of making pupil consultation a regular feature of my future practice. It has also highlighted some of the pitfalls connected with data gathering procedures, none of which can guarantee reliability. A policy of triangulation (where practicable in a busy environment) to maximise data quality must be weighed against the demands of a crowded timetable. Engaging children in discussion of what they find helpful or otherwise in their learning is

clearly feasible in later primary school. That said, children's evident ability to express their views and give reasons should not lead us to assume that we have been led to the truth. Children may be easily influenced by relationships, and their interpretation of what is helpful may signify no more than what is familiar. It should be noted that there has not been the opportunity during this project to check results with participants.

I propose to test various methodologies in researching pupil perspectives and, mindful of Pedder and McIntyre's finding (2006) that teachers differ in their responses to children's views, share findings with teaching professionals. It is clear that ethical considerations can be important determiners of research design. I would wish to explore the latter only in the light of a rigorous analysis of ethical issues. This, I believe, should be conducted afresh in for each new project whilst being well-informed. Ethical considerations should be "situational and context specific" (Morrow & Richards, 1996) and should benefit from the experiences of other researchers (Mahon & Glendinning, 1996).

As regards my use of images in future classroom practice, I will make routine observations of children's learning behaviours and exploit the immediacy of the moment to seek their views. Promoting the use of images that have cross-curricular applications would appear to encourage children to make their own connections. Difficulty in using imagery may be a learning opportunity as well as a challenge. I would therefore like to promote a culture of critical awareness of imagery in class whilst pursuing reflective learning more generally. In such an environment it would be desirable for children to take the lead, selecting their own images from a range of available sources and supporting one another in learning from them.

Features of this approach would include extending children's ability to interpret imagery through dialogue and debate, using images for problem-solving tasks and exposing pupils to diverse formats. Interviews revealed that the value of an image was as much a product of children's ability to make sense of it as of its intrinsic qualities: "Sometimes you can misinterpretate [sic] things in pictures and you can see things wrong or you just can't see things very well at all" (Zara). In all cases, however, I intend to have guiding principles in mind that reflect children's needs.

Cooper and McIntyre (1995) illustrate the value of fun in teacher-pupil transactions and power-sharing. Imagery can be powerful in securing engagement and should provide pleasure and excitement. However, children's recognition of the importance of their progress, reflected in this

study, indicates a readiness to be challenged rather than merely entertained. It must be a duty of teachers to respond creatively and reflectively, recognising that the value of images remains dependent on the quality of teachers' own pedagogy. As Bruner (1966) remarks: "It may be true that a picture is worth a thousand words, but [...] perhaps one word is worth a thousand pictures if it contains the conceptual key" (p.29).

## References

- Alexander, R. (Ed.) (2010) *Children, Their World, Their Education: Final Report and Recommendations of the Cambridge Primary Review*. Abingdon and New York: Routledge
- BERA (2011) *Ethical Guidelines for Educational Research*. Available online at: <https://www.bera.ac.uk/researchers-resources/publications/ethical-guidelines-for-educational-research-2011>
- Bruner, J.S., Olver, R. R., Greenfield, P. M., et al. (1966) *Studies in Cognitive Growth*. Oxford: Wiley
- Cetin, Y. and Flamand, L. (2013) Posters, self-directed learning, and L2 vocabulary acquisition. *ELT Journal*, 67:1, pp.52-61
- Chang, Y., Lin, C. and Lee, Y. (2005), The preferences of young children for images used in dynamic graphical interfaces in computer-assisted English vocabulary learning. Available online at [www.sciencedirect.com](http://www.sciencedirect.com)
- Cooper, H., Hegarty, P., Hegarty, P. and Simco, N. (1996) *Display in the Classroom: Principles, Practice and Learning Theory*. London: David Fulton Publishers Ltd
- Cooper, P. and McIntyre, D (1995) The crafts of the classroom: teachers' and students' accounts of the knowledge underpinning effective teaching and learning in classrooms *Research Papers in Education*, 10:2, 181-216
- Cooper, P. and McIntyre, D (1996a) The classroom expertise of Year 7 teachers and pupils. *Education 3-13: International Journal of Primary, Elementary and Early Years Education*, 24:1, pp.59-66



- Cooper, P. and McIntyre, D. (1996b) *Effective Teaching and Learning: Teachers' and Students' Perspectives*. Buckingham: Open University Press
- David, M. M. and Tomaz, V. S. (2012) The role of visual representations for structuring classroom mathematical activity, *Educational Studies in Mathematics*, 80, pp.413-431
- Davis, J. (1998) Understanding the meanings of children: a reflexive process, *Children & Society*, 12, pp.325-335
- Denzin, N. (1984) *The Research Act*. Englewood Cliffs, NJ: Prentice Hall
- Flavell, J.H. (1979) Metacognition and Cognitive Monitoring. *American Psychologist*, 34:10, pp.906-911
- Hattie, J. and Yates, G. (2014) *Visible Learning and the Science of How We Learn*. Abingdon: Routledge
- Hubenthal, M., O'Brien, T. and Taber, J. (2011) Posters that foster cognition in the classroom: multimedia theory applied to educational posters. *Educational Media International*, 48:3, pp.193-207
- Kellett, M. (2005) *How to Develop Children as Researchers: a Step-by-Step Guide to Teaching the Research Process*. London: Sage
- Kershner, R. and Pointon, P. (2000) Children's views of the primary classroom as an environment for working and learning. *Research in Education (Manchester)*, 64, pp.64-77
- Klausmeier, M. J. and Allen, P.S. (1978) *Cognitive Development of Children and Youth: A Longitudinal Study* London: Academic Press
- MacBeath, J., Demetriou, H., Rudduck, J. and Myers, K. (2003) *Consulting Pupils: A Toolkit for Teachers*. Cambridge: Pearson Publishing
- Mahon, A. and Glendinning, C. (1996) Researching children: methods and ethics. *Children & Society*, 10, pp.145-154
- McCallum, B., Hargreaves, E., and Gipps, C. (2000) Learning: the pupil's voice. *Cambridge Journal of Education*, 30:2, pp.275-289
- McIntyre, D., Pedder, D. & Rudduck, J. (2005) Pupil voice: comfortable and uncomfortable learnings for teachers. *Research Papers in Education*, 20:2, pp.149-168

- Mehrabian, A. (1972) *Nonverbal communication* Chicago: Aldine
- Morrow, V. and Richards, M. (1996) The ethics of social research with children: an overview, *Children & Society*, 10, pp.90-105
- Munn, P. and Drever, E. (1999) *Using Questionnaires in Small-Scale Research: A Teacher's Guide*. Edinburgh: SCRE
- Nodelman, P (1988) *Words about Pictures: the Narrative Art of Children's Picture Books*. Athens, GA, University of Georgia Press
- O'Neill, D. K., Astington, J. W. and Flavell, J. (1992) Young children's understanding of the role that sensory experiences play in knowledge acquisition, *Child Development*, 63:2, pp.474-490
- Pedder, D. and McIntyre, D. (2006) Pupil consultation: the importance of social capital, *Educational Review*, 58:2, pp.145-157
- Piaget, J. (1956) *The Child's Conception of Space*, pp. 447-457. London: Routledge
- Piaget, J. (1964) Development and learning, in R. E. Ripple & V. N. Rockcastle (Eds.), *Piaget rediscovered: Selected Papers From a Report of the Conference of Cognitive Studies and Curriculum Development*. Ithaca, NY: Cornell University Press
- Piaget, J (1974) *The Child and Reality* (English Translation), pp.93-107. London: Frederick Muller Ltd.
- Pointon, P. (2000) Students' views of environments for learning from the primary to the secondary school, *International Journal of Educational research*, 33, pp.375-382
- Pointon, R. and Kershner, P. (2000) Making decisions about organising the primary classroom environment as a context for learning: the views of three experienced teachers and their pupils, *Teaching and Teacher Education*, 16, pp.117-127
- Reid, D. J. and Beveridge, M. (1990) Reading illustrated science texts: a micro-computer-based investigation of children's strategies, *British Journal of Educational Psychology*, 60, pp.76-87
- Thomas, G. *How To Do Your Research Project*, London: Sage

- Thomson, P., Hall, C. and Russell, L. (2007) If these walls could speak: reading displays of primary children's work, *Ethnography and Education*, 2:3, pp.381-400
- UN Convention on the Rights of the Child (1989 - adopted) <http://www.unicef.org.uk/UNICEFs-Work/UN-Convention/>
- Vygotsky, L.S. (1978) *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press
- Wall, K., Higgins, S. and Smith, H. (2005) 'The visual helps me understand the complicated things': pupil views of teaching and learning with interactive whiteboards. *British Journal of Educational Technology*, 36:5, pp.851-867
- White, C., Easton, P. and Anderson, C. (2000) Students' perceived value of video in a multimedia language course. *Educational Media International*, 37:3, pp.167-175

**Appendix 1: Codes: aggregated frequency scores for interview statements concerning image use**

	<b>neutral statement</b>	<b>negative statement</b>	distracts/ disrupts	confuses	no benefit	<b>positive statement</b>	learn/ understand	continuity/ recall	provides context	models/ demo's	provides reference	inspires/ stimulates	social/ emotional	aesthetic/ pleasure	no reason given
gen imgs	2	19	10	8	1	21	6	1	4	2		7		1	
lrng wall	1	1	1			9	2	4			3				
IWB pics		1	1			4	1	1	1		1				
IWB vids	1	5		4	1	8	1	1							6
WB						3		1							2
poster						1							1		
displays						7	1	1				2	1	2	
mind map						1									1
diagram		2				11	3								8
cartoons		2				6			1						5
photos						2						2			
3D obj'ts						4				1					3
book ill's		2													
w'rksheet		1				2									2
English		2	1	1		5	2		1	1					1
Maths		5	2	3		8	3	1				1			3
Science						3	2								1
PE		1				1				1					
Geog						1				1					