# Drawing as a Unique Mental Development Tool for Young Children: Interpersonal and Intrapersonal Dialogues

**Article** *in* Contemporary Issues in Early Childhood · March 2005

DOI: 10.2304/ciec.2005.6.1.11

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# Drawing as a Unique Mental Development Tool for Young Children: interpersonal and intrapersonal dialogues

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ABSTRACT Using examples from children drawing in a year one classroom, this article examines firstly, how drawing operates as a unique mental tool, and secondly, the role of drawing in the construction and development of knowledge. Young children utilize prior knowledge and experience to negotiate and construct meaning through their interactions with people and artifacts in the learning community. Using a Vygotskian, social constructionist framework, a detailed analysis of interpersonal drawing dialogues is extended to include children's intrapersonal dialogic engagement with their drawing. When these children were encouraged to revisit, revise and dialogue through and with their drawing, they were able to explore and represent increasingly complex ideas.

## Introduction

In this article I propose that drawing can operate as a unique mental tool. Using a Vygotskian, social constructionist framework, I make a detailed analysis of young children's engagement with their drawing on both an interpersonal and intrapersonal level. I suggest that the ability of children to interact with drawing on both of these levels makes it a powerful meaning-making tool and that the social, cultural and historical aspects of drawing as a meaning-making process demand careful consideration.

In any learning context the relationships between the social, the cultural and the historical aspects inherent in the various forms of communication utilized combine to influence not just what is learned but also how it is learned (Vygotsky, 1962, 1978; Wink & Putney, 2002; Moll, 2002). In a social constructionist learning context, expertise is shared in order to negotiate and construct meaning. The learner brings prior knowledge and combines it with new knowledge through his or her interaction with others (Rogoff, 1990; Duran & Syzmanski, 1995).

This article examines the role of drawing in the construction and co-construction of knowledge. Co-construction has typically been understood as the interaction between adult and child, and child and child. However, I extend the notion of co-construction to also include children's engagement with others' as well as their own drawings. When children draw I am interested in what they bring to the task, their interactions with their environment and how they work to solve the problems or questions they encounter. I am also interested in the visual thinking processes that occur and how drawing operates as a tool for learning. My focus is the process by which meaning is made and how children come to a greater understanding of the world in which they live through drawing. Focusing on children's drawing processes and applying an explicitly Vygotskian analysis is a departure from traditional analyses, where drawings have often been viewed in a decontextualized and developmental manner (Kellogg, 1969; Lowenfeld, 1975; Smith, 1999).

Vygotsky (1978) viewed learning and development as dialectical in nature. He saw learning and development working together as a dynamic process in a socio/cultural/historical context. I see drawing as also being dialectical in nature and in this article I pay particular attention to the

immediate interactive relationship between interpersonal and intrapersonal drawing dialogues. I use examples from a study I undertook with children aged five and six years working on projects in their year one classroom.

**Drawing and Visual Thought**

Before I discuss children's interpersonal and intrapersonal interactions with drawing, I briefly review what I mean by visual thought. Traditionally, interpersonal and intrapersonal interactions have been understood as primarily verbal. Vygotsky (1962) suggests that the 'rational, intentional conveying of experience and thought to others requires a mediating system, the prototype of which is human speech born of the need of intercourse during work' (p. 6). Figure 1 illustrates Vygotsky's theory of the connection between thought and speech and the development of verbal thought.

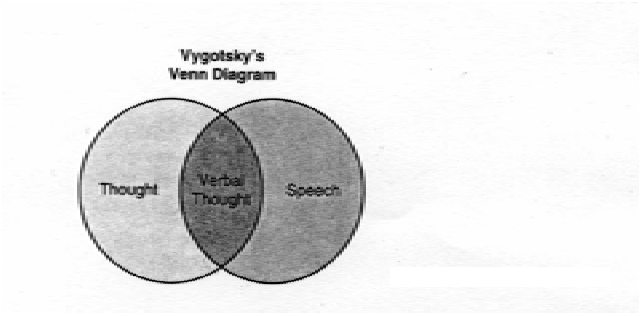


Figure 1. Verbal thought (Bodrova & Leong, 1996, p. 97).

However, while oral language was the primary mediation tool on which he focused his studies, Vygotsky (1962) also listed other mediation tools such as symbols, algebraic systems, art, *drawing*, writing, and diagrams.

If drawing is considered a language of sorts, then it is possible to consider how drawing might contribute to the formulation of thinking and meaning. Figure 2 borrows from Vygotsky's theory and illustrates a possible connection between thought, drawing and the development of visual thought (Brooks, 2003a, b).

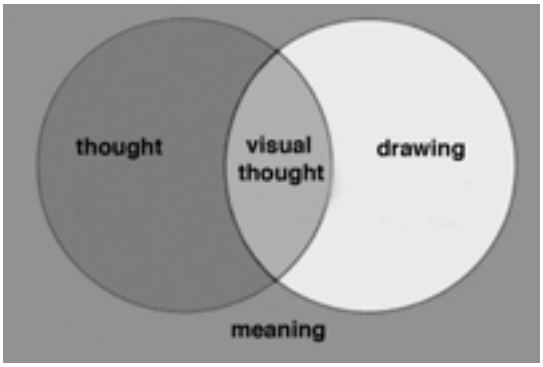


Figure 2. Visual thought.

Vygotsky (1962) described thought as being both whole and simultaneous. It is not always connected to speech. There is simultaneity in a completed drawing that parallels his description of thought. An image is seen as a whole and simultaneously, whereas speech has a more linear and temporal order. Perhaps the power of drawing for children (and adults) is that it more closely represents thought. Extending Vygotsky's principle of verbal thought playing a central role in mental development to include the notion that drawing and visual thought might also play a role

in mental development adds a new and different dimension to the analysis of children's drawings and practices of supporting drawing.

The permanency of a drawing offers possibilities for an extended dialogic engagement that speech does not (Brooks, 2003a, b). When young children do not yet have fluency with text, or perhaps language, then drawing offers a viable mediating role for communication, meaning making and problem solving (Brooks, 2003a, b).

### Interpersonal and Intrapersonal

In the social context of the classroom, drawing serves a useful function in supporting learning in many ways. I focus on the interpersonal and intrapersonal dialogues in relation to drawing and the relationship between the two dialogues. At an immediate and interactive level, drawing and learning dialogues operate in two different ways. Vygotsky (1978) suggests that the *inter*personal is where new mental processes exist first in shared contexts before they are internalized and that learners are active and interactive agents in their learning. The *intra*personal, or internal, is where new knowledge is internalized, absorbed and the dialogue continues at a metacognitive level. Vygotsky proposed that even when we are carrying out a mental action in isolation, we are not really participating in an individual mental process but are, rather, still operating in a social context. For example, we are using the social and cultural tools of language when reading a book, even when doing so alone. Books are themselves social, cultural, and historical artifacts. When reading a book we are constructing our interpretation of the text from our own experiential base that is itself determined by the cultural, social and historical context (Wink & Putney, 2002). I consider drawings to be artifacts that represent holistic reflections of experiential and cognitive knowledge grounded in a sociocultural, historical, and political context. The process of drawing reflects the context in which drawing takes place.

Vygotsky (1978) recognized the school as an important site for promoting the shift from personal experiences and interpersonal dialogues to more complex thinking. When children are exposed to ideas through their interactions with others in their community, they are able to grow into the intellectual life of those around them. Although it is important to recognize the interpersonal and intrapersonal relationships with drawing as two distinct processes, it is also important to remember that they work together in a continuous interactive spiral. I consider the role that drawing plays in the interplay between the two and demonstrate how drawing can mediate and support dialogic learning processes and children's thinking. While some work that researches the social contexts for drawing has been carried out (Kindler, 1996; Kindler & Darras, 1997; Edwards et al, 1998), little research has been undertaken that investigates the relationship between the interpersonal and intrapersonal drawing dialogues, based on a Vygotskian perspective. I address this gap.

### The Context for the Study

This article presents a small part of a larger study that was undertaken for my doctoral studies (Brooks, 2002). The research was a visual ethnographic study (Goldman-Segall, 1998; Pink, 2002) that examined the drawing processes of 22 five and six year-old children in an urban, year one classroom in Alberta, Canada. I was both teacher and researcher. A research assistant and a teaching assistant assisted with data gathering. Over a period of three months most of the drawing events that occurred during the course of the children's everyday project work were recorded on videotape. The children's drawings from these events were dated, scanned and saved. Research journals were kept by the researchers and selections of video reviewed and discussed with the children and families. A comprehensive collection of the video clips, children's conversations and drawings can be viewed, along with further analysis, at http://www.une.edu.au/Drawing/main.html

### The Context for Drawing

One topic under investigation during the children's project work time was 'light'. The children noticed as the days grew longer and the clocks changed. Investigating light in the context of the classroom brought each child's personal experiences with light and dark into an arena where spontaneous concepts were extended to include scientific concepts (for example, the notion of candlepower and the reasons for clock and time changes). Most children have used a flashlight but few would have taken the time to examine it closely. The children had many different ideas about how flashlights work and why there was a range in the quality of light produced. The children's cause and effect ideas tended to have a more spontaneous logical base. Bringing the many different ideas into the context of the classroom discussion and activities meant that the children were able to hear that others had different or conflicting ideas. Differing ideas helped to raise the questions that provided the impetus for further investigation by individuals and small groups of children. Compiling and comparing observational drawings gave the children a reference upon which to build and elaborate their ideas. Through shared reviewing, as well as discussions, the drawings prompted a deeper understanding of the concept in question. For example, the differences amongst flashlights became evident through drawing and through comparison of the different drawings. Comparing flashlights against different criteria helped the children to group and categorize in more complex ways; ways that acknowledged the scope of the technology of the culture in which they lived. The children in this class were encouraged to formulate thoughtful questions and to investigate these questions either in small groups or independently. Drawing was supported, encouraged as a meaning-making tool. This topic was extended to include investigations of shadows, cameras and photography.

### Interpersonal

When the children brought different light sources from home to share and discuss with their peers, a social context was established for the examination and exploration of the flashlights that provided opportunities for interpersonal exchanges and the creation of new knowledge. Interpersonal dialogues often began with exploratory behaviour that was accompanied by verbal dialogues of shared observations and prior experiences amongst small groups of children. Physical handling of, and experimentation with, objects seems to be an essential precursor to any in-depth investigation or abstraction. During the phase of interpersonal sharing of knowledge, children built an understanding of an object that did not depend solely on sight. The physical handling of objects brought a spatial as well as textural awareness. This physical knowledge seems to be an important factor in children's later ability to represent objects (Brooks, 1996).

A flashlight that had a three-way switch (Figure 3) to produce three levels of light fascinated Ed in particular and challenged his notion of the concept of 'on' and 'off'. Ed began his investigation of this flashlight by doing a detailed observational drawing of it. Ed's ability to represent the flashlight from a different perspective to the one in which he saw it (Figure 4) was contingent upon the physical explorations he had made before drawing. His initial drawing was a fairly detailed representational drawing (Figure 4) that brought the flashlight into the realm of symbolic. This drawing represents his immediate encounter with the flashlight.

At an interpersonal level, one of the functions of drawing is to provide a referent to the object, thus drawing the experienced object into the symbolic realm. When Ed was drawing the flashlight he was taking his accumulated experiences of this flashlight along with his observations and compiling the information into an immediate and holistic representation of the salient features of the flashlight. His drawing became a symbolic representation of some of the ideas he had about the flashlight. While he was drawing the flashlight, he was also talking with his peers about it. He was looking at other drawings children had done of the flashlight as well as receiving responses from his peers about his drawing. The drawings provided a common point of reference that was shared amongst the children, and were examples of new knowledge existing in a shared context.

Figure 3. The three way switch on the flashlight.

Figure 4. Ed drawing the flashlight.

Drawing the flashlight:

Ed seemed intrigued by the switch of the large flashlight. He discovered that this flashlight had three levels of light. He told me that he thought the light changes had something to do with the switches. His friend Blair told me that he thought the changes had more to do with some mechanism around the bulb. Ed began to explore his theory by making a drawing of the flashlight with a plan view (a plan view is an overhead view). Congruent with this perspective he used the cultural convention of occlusion to represent the stand the flashlight rests on. It was drawn as if it went under the flashlight. He drew the flashlight with the light on and brought his recent experience of observing it in the dark space (behind the black plastic, Figure 4) into his drawing by colouring black, to represent darkness, all around the flashlight. I noticed that the manner in which he had represented the light was similar to the girl next to him. He had perhaps thought of her as expert and borrowed an idea from her.

Figure 5. Ed explaining the 'on/off' flap.

Figure 6. Ed's final drawing of the flashlight.

I noticed that Ed drew the light from the bulb in a rectangular enclosed and uncoloured space. He drew the convex dome of the light bulb with a line to represent the transparency of the glass. He made a cover for this rectangular space with a piece of paper cut and coloured to match the surrounding area (Figures 5 and 6). He talked to me about the light looking as if it is off when the paper covers it and on when the paper is not covering it. This was Ed's way of representing the contrast between light and dark and the corresponding notion of on and off. Linking these two concepts through his drawing process moved him beyond a more immediate referent/object response to an intrapersonal level.

Ed then attached two pipe cleaners and another coloured piece of paper to represent the switch on the flashlight. The two pipe cleaners held the switch in place while also allowing it to move back and forth like the switch on the flashlight did. Now he could synchronize the moving of the switch with the opening of the flap (Figure 6).

This is a good example of drawing functioning as an activity that was leading Ed's development. He extended his notion of on and off to include the notion of three levels of 'on/off'. His drawing was more than a replica of what he saw. The process of drawing his ideas and observations moved him to higher levels of thinking. The focus in these drawings has consistently been the meaning the drawing holds in the construction of new knowledge. Any attempts Ed made at likeness or verisimilitude seem to have been to better understand the functioning of the flashlight, rather than to create a more realistic drawing.

Another example of an interpersonal dialogue can be found when Mark and Gordon worked together through their drawn plans. Each had drawn a plan for trapping the light from the light table. The drawings acted as a direct referent to the planned construction of a light-trap that was under negotiation. In this instance, the drawings allowed Mark and Gordon to see what each other meant. As they discussed their building plans and ideas, the drawings acted as a common point of reference, allowing new knowledge from each child to exist in a shared state before being combined to form new perspectives about how the light trap might be built.

Together they made a combined drawing that incorporated both their ideas. In this context, drawing was not only acting as a mediator between new and existing ideas, it was also acting as a social mediator that facilitated a common understanding and an agreement on how to work together on one plan.

An interpersonal drawing dialogue can also happen in a more formal context. For example, Gordon was invited to share his experience of a visit to a photography studio with the class by drawing on the whiteboard at a class meeting. As he drew the large lights of the photography studio, others were able to see what he was talking about and enter into a dialogue with him.

Gordon's drawing on the whiteboard allowed the teacher and peers to see the new knowledge that was being presented and make direct reference to it. This new knowledge existed at an interpersonal level through his drawing. His drawing was the mediator for an interpersonal

dialogic exchange, the foci of which were emergent ideas and theories about the functioning of the light. These ideas contained much physical and spatial information that may well have been lost in a verbal exchange or would have put too much demand on the child to explain.

Figure 7. Discussing the construction.

Mark examined Gordon's drawing of the construction he planned to build on the light table and felt that it would be too high and therefore not stable enough. He counted the blocks that Gordon drew and made a guess as to how high they will be. Gordon looked at his drawing and recounted his blocks. Mark was also concerned that the structure would not hold together in the way it has been drawn. Together they re-examined the blocks and redrew the plans so that there was some agreement about the structure on which they would work together.

Figure 8. Drawing for class discussion.

Gordon used his drawing to help explain his visit to the photography studio. He told us that the studio was very dark and that there are many big lights that are quite bright when they flash. He told us that the photographer put a black cloth over his head to take the picture. Because the photographer could not see Gordon while he was taking the picture, Gordon concluded that the flashlight must have a heat detector on it so that it would know where the person sat and when and where to flash.

Many children had also been to a photography studio and they had ideas that were both similar and different from Gordon's.

The interpersonal level could be viewed as the foundation from which the intrapersonal level grows. I suggest that it is important to pay close attention to the kinds of activities, opportunities, and discussions that accompany the interpersonal level. It is at this time that children's ideas, questions, and misconceptions are most visible. The implication for teaching is that children should be presented with opportunities to review and discuss important initial ideas.

**Intrapersonal**

Intrapersonal, or internal dialogues are necessarily harder to see and provide examples of, as we cannot see what is happening inside another person's head. When Ed made his first observational drawing of the red flashlight he had been concerned with the concept of 'on/off'. His initial referential drawing did not satisfy him. In order to better represent his idea of 'on/off' he devised a flap that, when lifted, revealed the light (Figure 6) and when closed represented the dark (Figure 9). The concept of 'on/off' and Ed's corresponding idea of a movable flap to represent 'on/off' was worked out through another intermediary drawing (Figures 9 and 10). His plan (Figure 10) shows a series of actions with arrows that link the images from left to right. The drawing indicates that first he had to colour another square of paper black to represent the dark. Then he had to staple the dark paper to cover the white space in the original drawing. He circled this series of drawings as if to signify that they are one significant idea. This drawing acted as a mediator between Ed's initial observational drawing and his more elaborate drawing that included the flap. Ed's drawings reveal his intrapersonal dialogue. These drawings are about the concepts Ed was working on. In them we can see something of Ed's intrapersonal thinking processes and problem solving.

Figure 9. Ed drawing his plan for a flap.

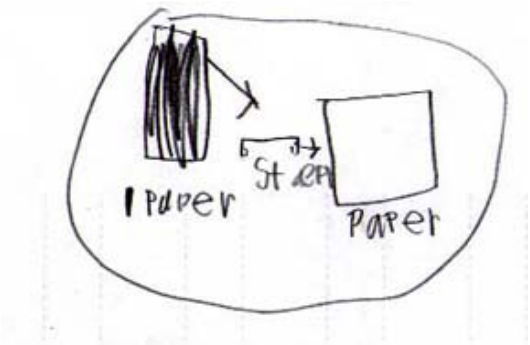


Figure 10. Plan for how to make a flap.

When Ed shared his drawing and the 'on/off' flap with his peers, they pointed out that his drawn switch did not adequately show the three levels of 'on/off'. Again, Ed had to revise his drawing. He added two pipe cleaners that held a small square of coloured paper that represented the switch. This new representation allowed the switch to move through several positions in a manner similar to the original flashlight switch (Figure 9). He coordinated the lifting of the flap to synchronize with the moving of the switch. Ed used his drawing and his intrapersonal dialogue with his drawing to develop a representation that more clearly described the three different levels of 'on/off.' When Ed made these additions to his drawing, he already had a good foundation in his original observational drawing from which to work. No doubt, his evaluation of the information missing from his original

drawing helped to move him to a more complex level of representation as well as an elaboration of his thinking about the three levels of switch. This expanded and elaborated drawing is representative of an intrapersonal dialogue made visible to us through a drawing. However, it was also the challenge from peers to his initial representation that provided the stimulus for Ed to move to this higher level of thinking and elaboration. The challenge was not for Ed to produce a more realistic drawing but rather to more clearly represent the ideas with which he was working. A social constructionist perspective contends that reality is a construction that is influenced by social, cultural, and historical factors: 'The nature of human visual perception is not one of recording the objective reality that exists independently of observation but rather of actively constructing an image of the world that is only partly based on retinal stimulation' (Ruby, 2000, p. 216). The eye as it is attached to the brain registers only part of the data (Arnheim, 1974). The brain forms rapid hypotheses that complement the retinal image and constructs an interpretation of what is seen (Arnheim, 1974). Ed and his peers seemed to respond to and benefit from the discussions and critiques that focused on the message or idea that the representation had the potential to convey. It was a discussion that centred on the construction of the representation and ideas rather than on a verisimilitude to some unattainable reality.

After the class discussion around his drawing on the whiteboard, Gordon made a second drawing of the lights in the studio (Figure 11). This drawing built on his experiences at the studio and his dialogue with peers around the whiteboard drawing. He was cognizant of all the comments, ideas and information he had received from peers and the teacher in the large group meeting. His second drawing was an extension and elaboration of his first drawing on the whiteboard. The discussion and thoughts generated from his first drawing caused him to revisit his ideas. Through the process of redrawing, his thinking about the function of the lights in the studio changed.

Figure 11. Gordon's second studio drawing.

This drawing shows the rethinking of Gordon's original idea. He shows how when the photographer (the man in red trousers) pressed the shutter on the camera this also activated the flash. He has drawn a cable between the camera the photographer is holding and the light that is flashing (grey circle with yellow radiating lines). Previously Gordon had thought that the light itself had a heat detector on it that would detect where the person sat and when to flash, independently of the photographer.

The drawing also shows Gordon posed for his photograph. He particularly remembers the pose he was asked to take, sitting sideways on a chair, turning his head towards the camera and smiling. He has drawn most of the room dark but has left a square of brighter, light red around himself to indicate the area that lit up when the flash went. He told me that he had expected the whole room to be bright but it was only part of the backdrop just next to him and himself that lit up. Gordon had also seen Ed's drawings and discussed the use of black to represent dark and the less coloured to represent light.

While this drawing was done independently without immediate interactions with those around him, it was nevertheless influenced by all of his previous experiences. Drawing helped Gordon integrate his new knowledge with his previous experiences and ideas.

In his second drawing, there is evidence of both his previous and new thinking. The drawing reveals a transformation of thinking that is indicative of an intrapersonal dialogue or internal revisualization. I found this drawing remarkable in its complexity. It contained a quantity and quality of information and ideas that would be difficult to convey or access in a written text.

One of the great strengths of drawing is its ability to reflect immediately the ideas of the person drawing. Gordon's drawing enabled me to see and imagine the dialogue that might have occurred between him, his drawing, and his ideas. This is perhaps why young children find drawing such a powerful tool. It is immediately holistic and interactive in ways that writing is not.

These examples show that while interpersonal drawing dialogues are important, it is worthwhile pursuing the cognitive complexity and abstraction that drawing seems to support at an intrapersonal level. This means asking more from children in their drawing, creating interpersonal and intrapersonal drawing dialogues that operate in an integrated, recursive and ongoing cycle, which builds more complex concepts and representational repertoires. Each successive drawing relates to and builds upon the previous drawings. If we think of drawing involving many steps and perhaps many drawings in the pursuit of an idea, possibilities are opened for children to use drawing over again in many different ways and contexts.

One of the qualities of drawing is the generative and divergent possibilities it offers. However, I caution against developing a series of steps that all children should follow in order to take the drawing process to higher levels of thinking. Tracing the qualitative changes in behaviour was important for Vygotsky's understanding of learning as a process of motion and change (Vygotsky 1978). The changes take place within the social and cultural context of the classroom and as such are influenced by this. In a similar way observations of these qualitative changes made visible through drawing are important for our ongoing understanding of how children are learning.

When drawing is viewed as a tool that is part of a meaning-making repertoire it helps teachers to see drawing as part of a learning process, rather than as a product that is indicative of a more rigid stage of development. When the drawing skills become part of the struggle to articulate meaning, teachers can work with children to clarify meaning with the assumption that it may take several drawings to reach a desired level of understanding.

**Conclusions and Recommendations**

In school settings, ideas and ways of processing information are shared amongst teachers and children so that 'a child does not just become a thinker or a problem solver: she becomes a special kind of thinker, rememberer, listener, and communicator that is a reflection of the social context' (Bodrova & Leong, 1996, p. 10). The materials, spaces, time, and the social contexts that are offered and constructed in the classroom have direct implications for, and influences on the learning that occurs (Wertsch, 1985; Wells, 2000). In this study, the presentation of easily accessible high quality drawing materials and spaces set aside for their use promoted drawing elaborations in a social context over time. Children were able to exchange ideas about the topic they were studying as well as support each other in different ways of using the materials. When the children work together with drawing, the conversation often includes commentary on the use of drawing materials as well as the representation processes and ideas being explored. Likewise, when collaborative work is valued, the classroom space and materials are presented in ways that support this position and much of the burden for learning is shifted from the teacher and shared among the whole class group. When all decisions about what and how to learn rest with the teacher, children seem to be deterred from becoming co-constructors of their own learning.

When the interactions between teacher and child, and child and child, encourage discussions about ideas, meaning, and learning, children hear that this is something their learning community values. These children brought flashlights from home believing that they would contribute to the ongoing explorations of the whole class. When Ed observed his peers drawing flashlights he was inspired to do the same. He borrowed from their ideas and processes. In this context Ed knew that observing, borrowing, and co-constructing his understanding were learning strategies that were

valued and supported. When Gordon shared his experiences about having his photograph taken and his theories about how the lights worked he did so believing that his peers would be interested and that this information was relevant to our ongoing investigations. Strategies for learning, thinking, and using drawing as a meaning-making tool have to be modelled and talked about individually, in small groups, as well as in large group situations. This approach to learning recognizes the particular skills and experience each child brings and involves each child in a continuous interactive spiral where the collective understanding and discussion works to support individual constructions. The children and I found that drawing functioned well as part of this interactive dialogic model.

Drawing can help children make their ideas visible. When drawing is one of the modes of classroom exchange, drawings can be preserved as a record of children's current thinking that can be reviewed and revisited by both teacher and children. They can also serve as a vehicle of exchange within the wider learning community. Children are able to represent complex ideas in their drawings, extract information from the contexts in which they work, and transform these new ideas through their drawings. However, the support, time and opportunity for children to pursue complexity in their drawing have to be part of the teaching and learning environment. Time and encouragement to revisit drawings and to redraw ideas supports the shift from the immediate encounter to more complex symbolic representations. The focus of discussions about the drawing should be the meaning and information it contains rather than drawing skills and aesthetic qualities. This shifts the focus from a performance criterion to one that is concerned with the meaning that the children are trying to make of certain phenomena through their drawing. Such an approach opens a dialogue that involves children actively at a cognitive level. Drawings like those presented provide valuable insights into children's thinking and records of their growth and development. I suggest that when our focus is primarily on the meanings represented through drawing we begin to see drawing as an invaluable teaching and learning tool.

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