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The Postcards Approach – young children sharing drawings and stories about their environments

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Introduction

The term, 'Nature Deficit Disorder', coined by Louv in 2005, refers to an ever-growing disconnect between children and their natural environments. This is concerning, as researchers believe that if an ethic of caring towards the environment is not established in the first few years of life, then these attitudes may never be developed (White 2004). It is doubtful that a generation of persons with neither interest in, nor knowledge of the environment would make responsible decisions in regards to environmental sustainability (Dighe 1993).

Based on this concern, many scientists and educators are now considering how children could best be stimulated and encouraged to reconnect with local, natural environments. With the notion that environmental education would be more effective if educators/ researchers better understood how children see and conceive nature, so that learning can be more grounded in the child's conceptual framework (Martin 2007), this research sought to unveil and even extend these understandings by focusing on children's perceptions of their own and others' environments.

Following initial research into the use of the arts to elicit children's understandings about environment (Sorin and Gordon 2013; Brooks and Sorin 2012), the researchers chose the arts-based methods of drawing and storytelling for data collection. Huss and Cwikel (2005) note that arts-based research can utilise the arts for data collection and/or analysis. Further, Barazza (1999) states, "drawings are useful tools in providing valuable information for the assessment of children's environmental perceptions" (49). Drawings, accompanied by stories, were deemed suitable because young children do not always have the words to describe what they see, think or feel (Sorin 2004). The various forms of arts expression – visual art (drawing, painting, sculpture), dance, music, media, creative writing, etc. – offer many avenues through which children can communicate their thoughts and feelings.

The arts, then, become “givers of diverse perspectives and values and remarkable tools to make meaning” (Cornett 2007, 2). Hurwitz and Day (2001) also suggest that, “Many art educators today advocate a teaching philosophy that encourages students to think about the relationship of art, ecology and community (19).

The purpose of this research was to stimulate and encourage children in kindergarten/ pre-Preparatory (ages 4 – 5 years) classrooms in Australia (Cairns), and Canada (Toronto) to construct and share their environmental understandings, concerns and perceptions with their peers across the globe through pictures and stories. Over ten weeks, children constructed postcards and shared and responded to them in a secure, online environment with their peers in the other country. The research was framed by the question, *“How can we use arts-based, multimodal methods in a cross-country online learning environment to determine and enhance young children’s understanding about their and others’ environments and environmental sustainability?”*

Conceptual Framework

With the notion of the child as agentic, this research took a sociocultural approach to learning. Further, it implemented a multimodal framework, using the arts and storytelling to support children’s expression of their ideas and as data collection tools. This provided a holistic way of approaching the problem, while including children as active participants in a community of learners, with multiple pathways for participation.

As researchers we view children as capable and competent learners, actively participating in their learning and decision-making alongside peers and adults, who guide, co-construct, negotiate and challenge children’s learning (Corsaro 1995; Sorin 2005; Sorin and Galloway 2005). Research is conducted with children, rather than about them, as they have a place in data collection and interpretation (Sorin and Galloway, 2005). As James, Jenks and Prout (1998) note, within this view, childhood has a status of its own and children are social actors with needs and rights.

The sociocultural approach to learning in this research emphasised the socially negotiated and embedded nature of meaning-making (Murphy and Hall, 2008). Central to this perspective is the belief that knowledge exists between and among individuals in social settings and learning occurs through interactions that are influenced by different cultural and multimodal representations (language, pictures, etc) within and beyond the classroom. Children learn with understanding when they bring their diverse experiences, perspectives, expectations, knowledge and skills to their learning and are supported by peers and more knowledgeable others (Vygotsky 1978; Goos 2004).

The multimodal framework, incorporating multi-literacies, acknowledges diverse ways of expressing thoughts and ideas. They include image, story, text, gesture, sound, etc. (Larson 2006). In the Reggio Emilia movement, young children are encouraged to use “graphic languages and other media to record and represent their memories, ideas, predictions, hypotheses, observations, feelings” as ways to learn and demonstrate learning (Katz in Edwards, Gandini and Forman 1998).

Utilising multiple ways of expressing extends children’s abilities to learn and to express that learning (Binder 2011; Sorin and Gordon 2010); offering them narrative tools to help them to order and understand their worlds (Blizard and Schuster, 2007). Storytelling accompanying drawings, the method chosen for this research, could be deemed necessary to represent the child’s rather than the researcher’s intended meaning and interpretation (Benson 2009).

Children & their understandings of environment

Australia holds some of the most unique, diverse and valuable ecosystems in the world. This is particularly true in Far North Queensland, where ecosystems range from the Great Barrier Reef to tropical rainforests and naturally air conditioned tablelands (Westoby 1993). These ecosystems are sources of clean air, water and primary production, so their maintenance is essential to our survival.

Today’s children are the future caretakers of this valuable, but fragile environment. Therefore it is essential that they have an understanding of, and

appreciation for, the role, value and function of the environment. Sobel (1996 in Miles 2008) stated that the protection of nature is dependant upon not only environmental organisations but also quality relationships and attachments between children and nature. Nurturing a positive environmental ethic at an early age can serve as a critical step in developing an environmentally literate and concerned citizen.

But children today, rather than being active in and appreciative of the environment, have at best a reduced understanding of the environment and the role it plays in the wellbeing of society. This has been called “nature deficit disorder”, a term coined by Richard in his 2005 book, *Last Child in the Woods*. ‘Nature deficit disorder’, refers to an ever-widening disconnect between children and their natural environments. As White (2004) notes, “Children of today have few opportunities for outdoor free play and regular contact with the natural world.”

Based on this concern, many scientists and educators are now considering how children can best be stimulated and encouraged to reconnect with local, natural environments. With the notion that environmental education would be more effective if educators/ researchers better understood how children see and conceive nature, so that learning can be more grounded in the child’s conceptual framework (Martin 2007), this research sought to unveil and even extend these understandings by focusing on children’s ‘place consciousness’, or consciousness of one’s immediate environment and an awareness of other places beyond one’s own locality (Gruenewald 2005).

The Arts and Environmental Understanding

While sustainability concerns increase (Miller 2007; Oxford and Lin 2012), what children understand about the environment and sustainability is unclear.

Researchers have limited knowledge about how environmental attitudes and behaviours develop during childhood (Evans, Juen, Corral-Verdugo, Corralize and Kaiser 2007). Further, although there have been studies about children’s environmental awareness, understandings and perceptions (e.g. Barazza 1999; Bowker 2007), researchers to date, while collecting data from various locations, have not yet considered nor applied open communication between research

participants at various locations. In addition, much of the research to date has focused on analyzing data findings on a quantitative basis only, measuring attitudes, perceptions and understandings using scales, rather than describing unique and common categories.

Barazza (1999) states that “drawings are useful tools in providing valuable information for the assessment of children’s environmental perceptions” (49). Further, Huss and Cwikel (2005) note that arts-based research can utilise the arts for data collection and/or analysis. In this research, drawings accompanied by stories were deemed suitable because young children do not always have the words to describe what they see, think or feel (Sorin 2004). The arts, then, become “givers of diverse perspectives and values and remarkable tools to make meaning” (Cornett 2007, 2). Hurwitz and Day (2001) also suggest that, “Many art educators today advocate a teaching philosophy that encourages students to think about the relationship of art, ecology and community (19).

Arts-based methods evident in the qualitative literature include dance, implemented by Torzillo (2009) to express her data findings; photo elicitation used as a tool in several studies to evoke children’s and adult’s memories and experiences of place/s (Benson 2009; Kyle and Chick 2007); and combinative methods, such as Somerville’s (2008) methodology, which used the visual arts (paintings, photographs), storytelling (oral and written) and ICT’s (dvds, audio) to represent people’s place relationships and stories. However, of all the artistic mediums, it appears as though drawings are those most commonly used in research with children about their environments.

Drawings, or visual narratives, are recognised as tools for exploring ‘big ideas’. Barazza (1999), notes that “the content of children’s drawings may provide insight into their thoughts and feelings about the world” (49). Barazza (1999) used drawings as a research tool on several occasions to determine Mexican and English children’s environmental understandings and awareness; Alerby (2000) asked children to complete drawings representing what they thought of when they heard the word ‘environment’; and Bowker (2007) had children complete drawings both prior to and after completing a unit of work on tropical rainforests, as measures their environmental learning.

Anning & Ring (2004) note that children's creativity is 'syncretistic'; individual arts have yet to be separated and specialised. Therefore, children are likely to draw pictures and tell a story at the same time. They suggest that young children's narratives offer tools for them to organise and explain their complex worlds. Drawings, combined with storytelling, enrich and inform each other (Wright 2008). By sharing stories about their environments, children give order, significance and meaning to the chaos of their experiences (Blizard and Schuster 2007). Drawing and story-telling combined, then, appear to provide a holistic, art-based research tool that allows children to represent their multiple meanings in verbal and non-verbal ways.

Visual images are a good way to introduce concepts to children. Orlich and colleagues (2013) suggest showing young children different pictures of environments and asking children to describe what they see in the pictures and the patterns they observe. They say that each child will respond to specific aspects of the environment and attempt to structure a meaningful pattern based on his or her observations and those of others in the group. More knowledgeable others (teachers, researchers and other students) can then support children to distinguish clearly between statements based on observations and those based on inference.

Unfortunately arts-based methodologies are often overlooked/ undermined due to a Western bias towards linguistic intelligences (Knight 2008), with the general assumption being that anything we think, feel, sense, can be said (or written) in language (Kendrick and McKay 2004). The significance and innovation of this research is that it implements emergent, qualitative, arts-based research methods to ascertain (cross-culturally) children's understandings of their local and global environments. These methods are described below.

Research Methods

The purpose of this arts-based research was to generate rich, cross-cultural data about Kindergarten (4-5 year olds) children's understandings, concerns and perceptions of their local and global environments. The research was emergent qualitative and included children's drawings and stories, other work

artefacts such as group stories and murals, observations, semi-structured interviews, and researchers' and teachers' journals (Bamford 2003; Rose 2007). Data were collected from 22 kindergarten children and their teachers in one classroom in Australia (Cairns), and 19 kindergarten children and their teachers in Canada (Toronto) over a 10-week period. Researchers attended the centres for 10 sessions of approximately 2 to 2 ½ hours each.

Akin to action research cycles, children created three visual and verbal texts in the form of large postcards and accompanying narratives that depicted their understandings, concerns and perceptions in relation to their local, natural environments and in response to environments described by children in the other country. Researchers and teachers trialled various arts-based pedagogies during this process (such as postcards, stories, group drawings and murals). Artefacts produced by the children were also collected, along with observations by researchers and teachers made in class, and notes recorded in researchers' journals.

In the first weeks, the researchers conducted interviews with children and teachers about their environmental understandings. These pre-program interviews asked children what they know about their own and other environments, including any benefits or concerns about the environments. Teachers were asked what children knew about their environment, what they need to know and what curricula or actions were being taken to teach children about environmental sustainability. At the end of the 10 weeks, children and teachers were re-interviewed, again asking them similar questions.

Between the two interview sessions, children utilised arts-based methods (drawing and storytelling) to create three postcards to share with the children overseas. Postcards were shared via a secure online blog, allowing children to respond and seek additional information from their peers. At times, children also created stories, word lists and murals (painting, collage and drawing) to demonstrate their knowledge of the environments.

The nature of using visual texts requires an innovative and contemporary approach for research design, where the images children create are also recognized as valuable data to be interpreted and used to inform practitioner

understanding (Rose 2007). A multimodal approach provides the spaces for visualizing voice (Soto 2005), and reveals the complexity of meaning-making, incorporating a more holistic and synergistic way of looking at the issues (Leavy 2012).

Textual data were analysed for emerging themes, while visual data (postcard drawings and stories) were analysed using the Content, Interpretive, Developmental System (CIDS) (Haring 2012). This approach begins with Content Analysis, where data are examined for the presence or absence of features of the environment, and also the number of times each feature is represented. Merriman and Guerin (2006) affirm that “content analysis has an important contribution to make to the analysis of drawings [because] it allows both a qualitative exploration of what is drawn, as well as the potential for quantitatively considering how often particular themes or categories appear” (50).

Interpretive Analysis involved looking at the ways elements of design were presented, the mood of the picture, and the messages conveyed by the drawings and stories. This form of analysis is based on the assumption that the child’s drawings are displays of emotions, opening a window to the child’s ‘soul’, similar to an ‘open diary’ (Krenz 2004). Despite being based on careful observations and ‘reflective thought’ (Hansen-Ketchum 2004), interpretive analysis has been criticized with Vandergrift, Platzner, Hannigan, Dresang, Lewis, Brizendine and Satchell (2000) stating that analyzing a drawing opens “multiple possibilities of interpretation”, as many different elements in a drawing could influence the researcher’s perception (e.g. Western held colour symbolism).

Finally, Developmental Analysis looked at the data in terms of what it stated about the child’s drawing development. Various names have been given to the theories of developmental stages; most researchers agree that the innate curiosity of the young child starts with scribbling marks on paper and ends with achieving pictorial realism in adolescence (Day and Hurwitz 2012). Although, the developmental approach has been criticized, the researchers believed

taking into account the age and drawing abilities/ stages of the child participants was a necessary consideration when interpreting the visual data.

This paper focuses on the postcards themselves, and what they, as visual narratives, revealed about children's environmental understanding. Discussion will focus on the Australian children as they undertook a series of three postcards to their Canadian counterparts.

Findings

Creating and sharing postcards with an authentic audience encouraged children to share their understandings in a confident, engaged and deep manner with their peers, and generated rich, cross-cultural representations, understandings, concerns and perceptions of their local, natural environments from two different locations. More specifically, we found that:

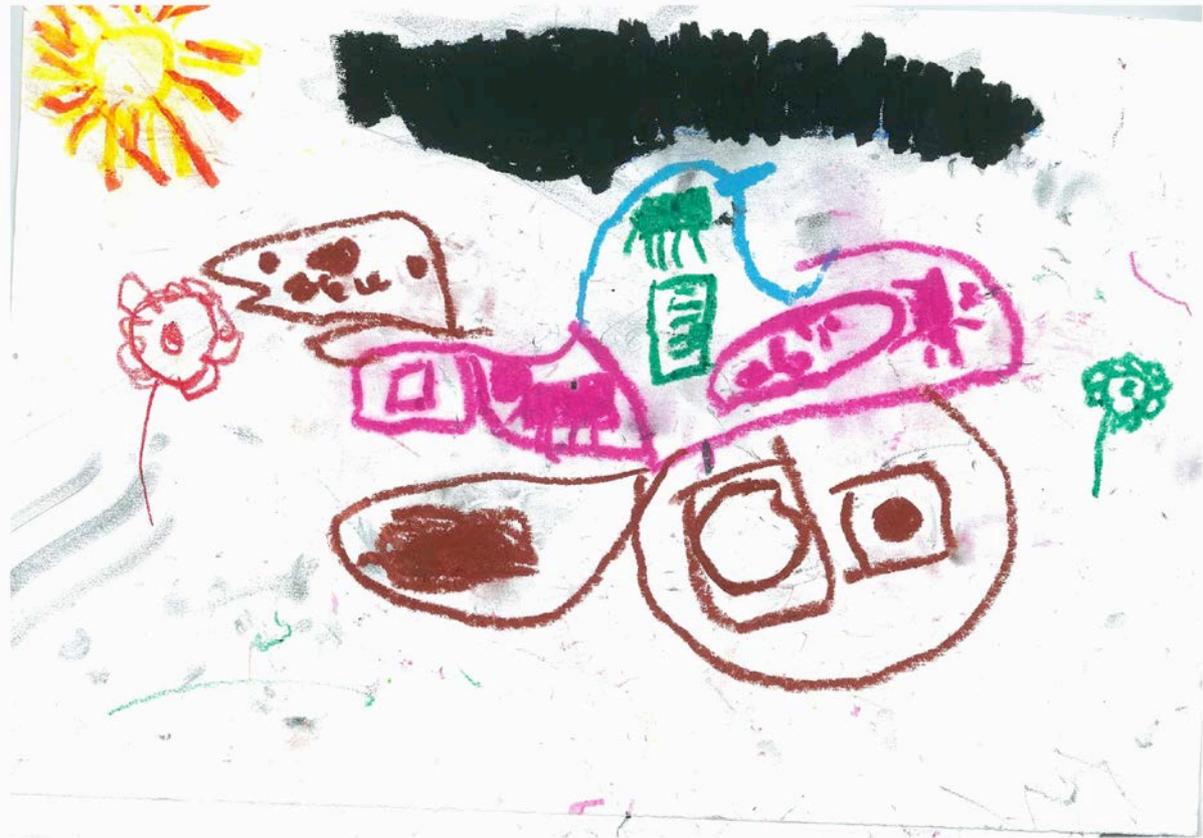
- From the first postcards created, it was clear that most of the children had a fairly good understanding of their local environments. This was evident in both the visual images and the stories that accompanied them.
- The multimodal framework, incorporating multi- literacies (images and stories), offered children multiple ways to communicate their understandings.
- Having a specific audience seemed to motivate children to enhance their visual narratives.
- Visual narratives seemed to progress from the general to the more specific; and from the immediate environment of the home to the larger regional and global environments.

Each of these findings is elaborated below.

Good initial understandings

Even from the first postcards produced by the Cairns children, many demonstrated a good, basic understanding of their immediate environment. For example, in K's first postcard she used strong colours and well defined shapes in what appears to be an aerial view of her house. There is a sun in the black sky (See Figure 1).

Figure 1. K's first postcard



While introducing herself, K. recounted an incident where she went to the park with her mother. This is followed by a description of her drawing. She said,

It is dark. The sun went down. I said to Mum, "Can we go to the park soon?" There were flowers and sunflowers [in the park]. It was very, very dark and I could see the stars and the moon.

Mum said, "Dinner is ready." We had fish and chips.

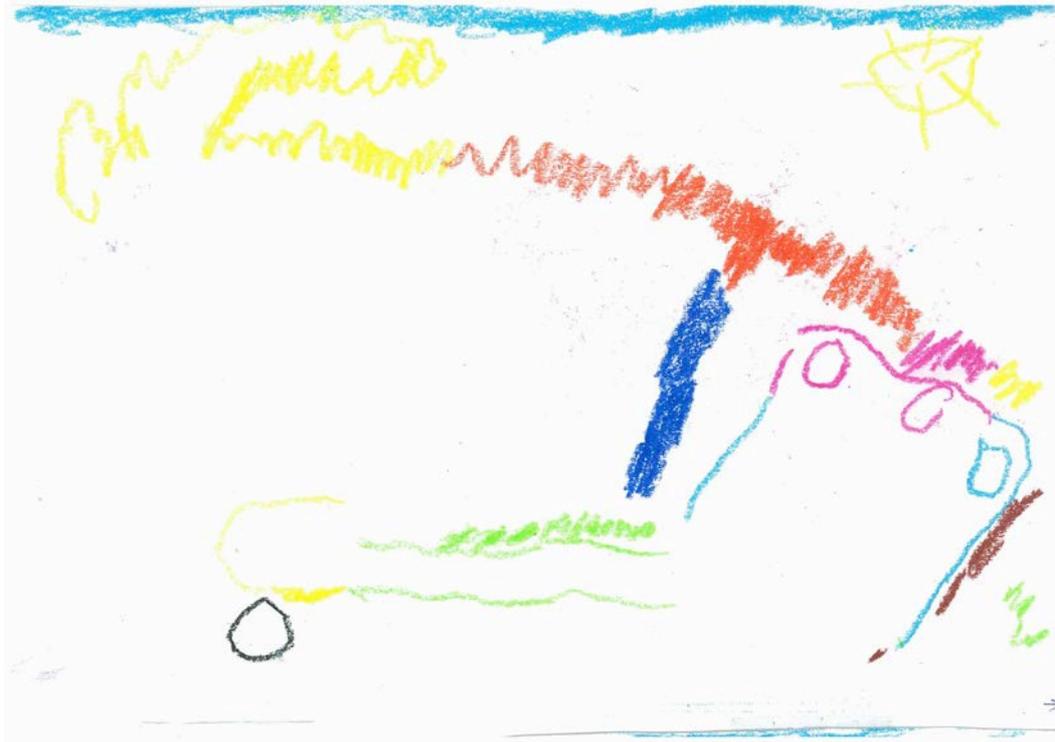
In the middle is my house. The brown part is the lounge room.

Down below is the shed and the play room.

S's first postcard utilises bright shades of blue, yellow, red, pink, brown and green with organic lines and circles (See Figure 2 below) A house-like shape appears on the right; the sky is coloured blue; and grass and possibly a tree appear near the bottom of the image.

But it is the accompanying story that demonstrates S's understanding of his immediate environment. It is: "The blue sky and the sun is hotter than fire. Nobody can go outside because it is too hot. My house has upstairs and that area is downstairs. We have grass and rocks where our car park is. The house is on a long road. You need a four wheel drive on some roads."

Figure 2 – S's first postcard



In the first postcards, a number of children represented features of their homes, either inside, outside, or both. The indoor environment included: features such as wooden floors; rooms in the house (eg. loungeroom, kitchen, bedrooms – "My new room is blue. We have beds with pink sheets" and garages – "This is where my car lives"); people in the house (eg. Mum, Dad, siblings and pets "This is my pet guinea pig, Bubbles"); and indoor activities such as toys ("I have 10 Barbie dolls") and television.

Depictions of the outdoor environment were even more elaborate, from grass and gardens (bamboo, lychee and pineapple, sunflowers, swimming pools, palm trees); weather features ("Sometimes I see lightning and I hear thunder", "There is a wind storm, but the sun is shining and there is a blue sky."); streets and neighbourhoods ("I live in Brinsmead in Cairns"); features in the local

environment (“We have a creek in a park down the road from our house”, “When we play tennis we go down the street”). Friends, pets and activities are also featured in outdoor environments (“I play poison ball. I have two dogs who are called Cooper and Bundy. I play with Cameron and Jess”, “My back yard has a hoola hoop”. “I play football. I play Hot Potato”).

In a very few cases, initial drawings also made some mention of the regional environment (a drawing of a large rubber boot statue which is featured in a local town is accompanied by the story, “This is the big gumboot that is in Tully. It rains a lot in Tully”). See Figure 3.

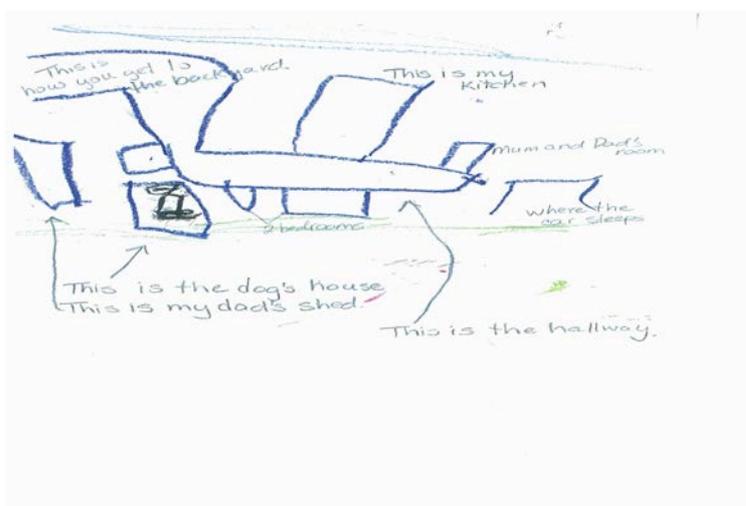
Figure 3 – The large gumboot in Tully (a town in far north Queensland)



Further, one child mentioned a place beyond Cairns, stating, “I went to Japan.”

A few children's postcards appear as 'maps' that give direction to both the indoor and outdoor environments (See Figure 4 below).

Figure 4 – 'Map'



Multi-literacies (images and stories), gave children multiple ways to communicate their understandings

As stated earlier, young children do not always have the words to communicate what they see, think and feel (Sorin 2004). By providing children with alternative ways to communicate their understandings, such as through the arts, children were better able to express their thoughts and feelings about the environment. In Figure 4 (above) the child's actual story was, "We live in Cairns." However it was through his very intricate map that he demonstrated his knowledge of his home environment and, in this case, was also happy to label it (kitchen, hallway, Mum and Dad's room, where the car goes, dog's house, dad's shed, and route to back yard) with the help of a researcher.

For other children, having the opportunity to draw their understandings in the first instance supported them to verbalise their ideas. One of the children, C., rarely spoke or participated in class; it was unclear what she knew or learned. She had initially refused to create a postcard and did not participate in the first round of postcard-making. However, after viewing the Toronto children's postcards, listening to class discussions and working one to one with a researcher, C began creating colourful, detailed drawings and elaborate narratives that clearly demonstrated her understanding of the environment. Figure 5 (below) is C's first postcard.

Figure 5 – C's first postcard



Being allowed to express herself in the first instance through visual images, offered C a voice that she may not have always had within the class. She chose bright, strong colours and worked diligently on her drawing. When she had completed the drawing, she dictated the following story to the researcher:

We go camping. That's our tent and a table outside. We go bushwalking. There's a frog on the rocks. At night the possums come out. Daddy is in the tent and Mummy. That's me here and M [sister]. She is two. There is a creek – cannot be cold water. They are trees and there is a dog. Snow doesn't come to our house.

Following the success she felt with her first postcard, C continued to make other colourful postcards (Figures 6 and 7 below) and to elaborately describe her illustrations.

Figure 6 – C's second postcard



Figure 7 – C's third postcard



In these two postcards, C continued to describe her family, pets and environment. By the third postcard, addressed to “Dear Friends”, C told a story of an experience with a Cassowary and a Dingo, rare Australian animals:

We saw a cassowary on the beach. He came close to us. It is a big bird. It is much bigger than me. It got a comb on its head. This big bird is black and red and white. We ate lollies on the beach. We had a bag with red lollies. I was not afraid of the bird. I did not go close. I listened to my mum. There were dingoes too. There was a lot of sun and mountains in the back.

Authentic audiences motivated children to enhance their visual narratives

Overall, the Cairns children demonstrated a good understanding of their immediate environments, even from the first postcards. However, that understanding seemed to be enhanced by having a specific audience for their postcards. An example of this is L’s work. L’s original drawing (Figure 8 below) is a few lines and circles, in orange and red. In his narrative he explained, “There is a stick falling out of a big tree.” He did not seem to engage with the activity, and his drawing had very little to do with his immediate environment.

Figure 8 – L’s first drawing



However, L became more attentive following receipt of postcards from the children in Toronto. He was particularly impressed by one by A - a series of red circles, some forming figures, lines and letters. The narrative accompanying the postcard said "I like to play with dinosaurs. I like to skateboard and I like scooters." Based on this postcard, L. responded in with three illustrations of items from a local park (Figures, 9, 10 and 11 below) and a direct communication with A in Toronto; demonstrating quite an awareness of the local environment. He said, "Dear A., How did you draw that? In Cairns we have a Pirate Ship park. I play with my little brother, Z here. I like the green and black dinosaur [shown in Figure 9]. Which do you like?"

Figure 9 – L's Big and Little Dinosaur



Figure 10 – The pirate ship and water park

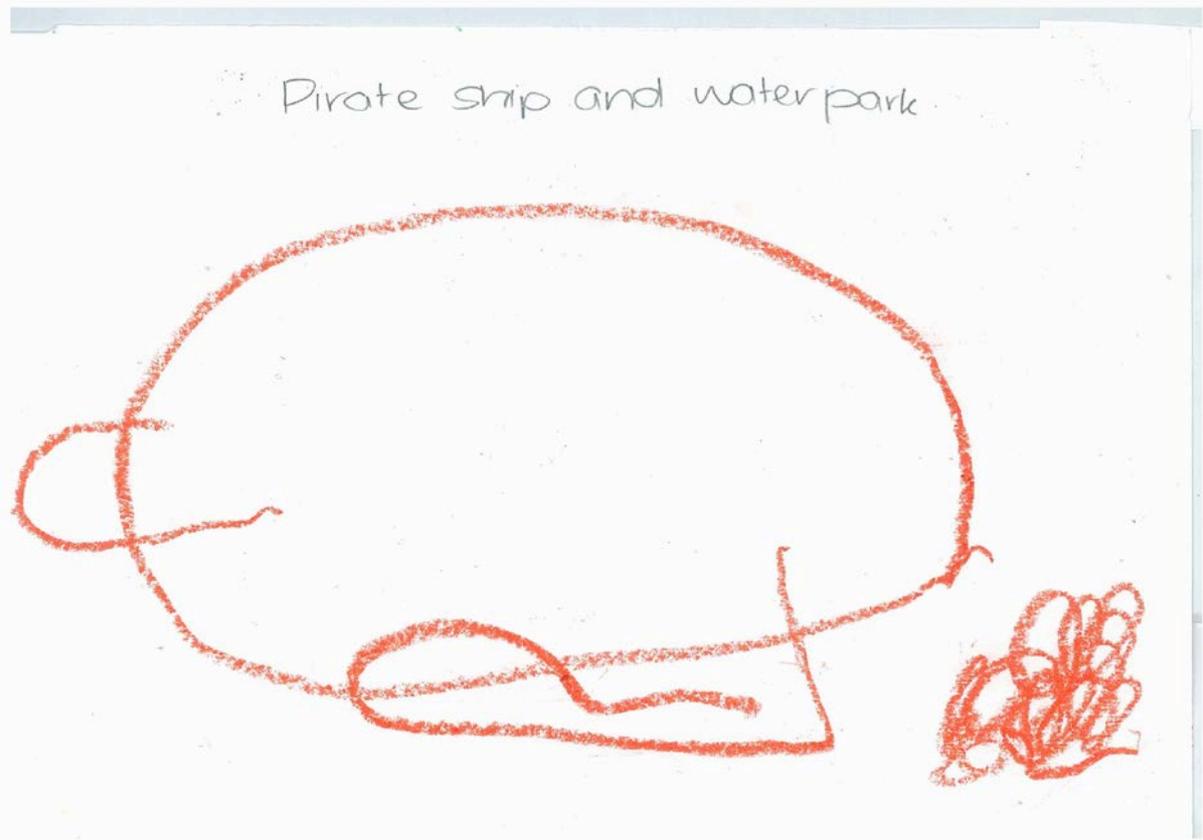
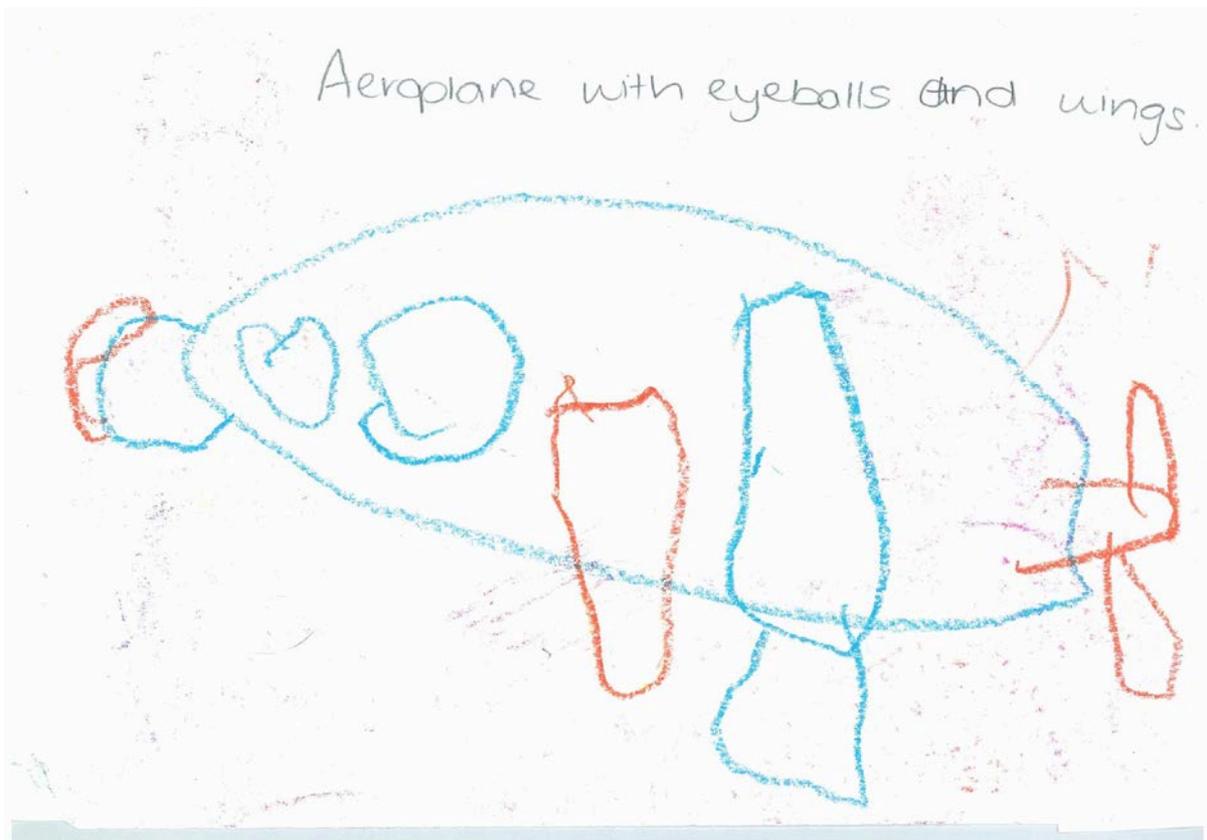
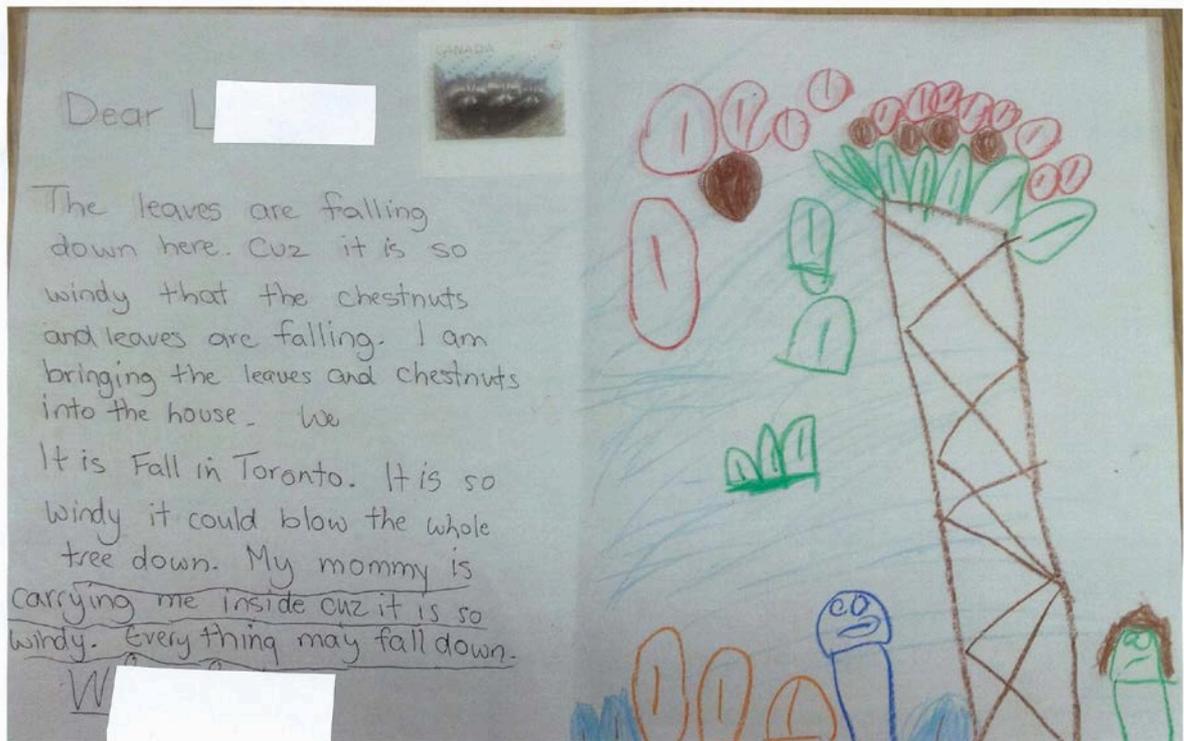


Figure 11 – Aeroplane with eyeballs and wings



Even though L's first postcard, of a stick falling from a tree, was quite limited, another child in Toronto, A, responded with quite an elaborate postcard about leaves falling from the trees in Toronto (Figure 12 below). A said, "Dear L., The leaves are falling down here, cuz it is so windy that the chestnuts and leaves are falling. I am bringing the leaves and chestnuts into the house. It is Fall in Toronto. It is so windy it could blow the whole tree down. My mommy is carrying me inside cuz it is so windy. Everything may fall down. W." This response also motivated L. He chose blue and green crayons, pressing hard on the paper to achieve what he described as "water." His story was "The leaves fall down sometimes but mostly they stay on the trees. It rains sometimes into my house. It is hot in Cairns." L went on to another postcard, drawing a green circle and recounting, "I went in a pretend car with my brother A. Have you been on an aeroplane? I've been on an aeroplane to Cairns a long time ago. You wrote me a very long postcard. The trees don't nearly blow down here." Again this demonstrated L's knowledge of his environment, including being able to compare Cairns to Toronto in regards to leaves falling from trees. He said that the leaves in Cairns "mostly... stay on the trees."

Figure 12 – A's response to L's first postcard



Without L's specific audience (W and A) his engagement was minimal and it would have appeared that he had very limited understanding of his environment. However, from A's initial postcard, where the dinosaur toy seemed to catch his eye, to his response to W's postcard to him, where not only did he demonstrate an awareness of his own environment, but was able to compare his environment to that of the child in Canada, the content of L's postcards increased and a deeper understanding became apparent.

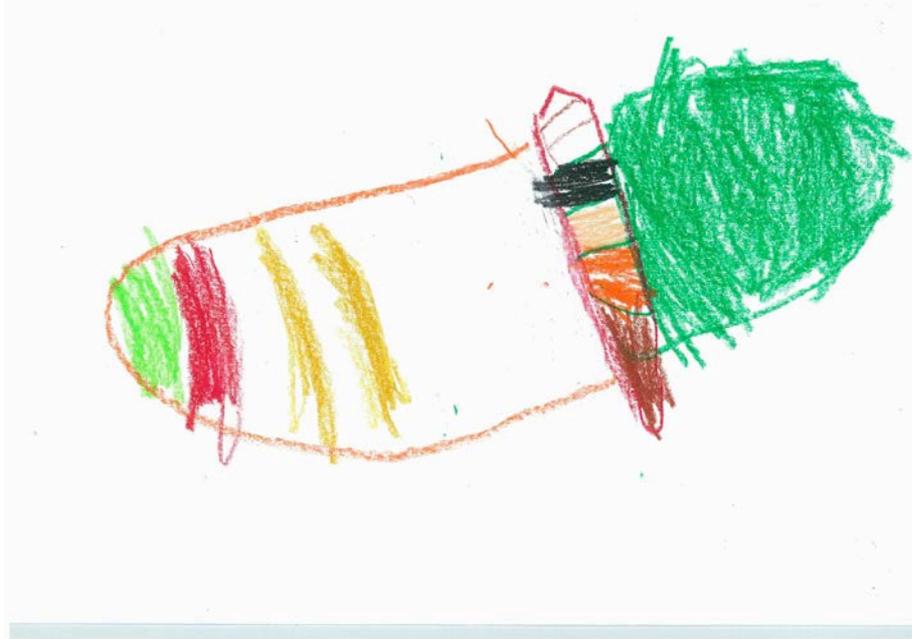
Progression of Visual Narratives

Through the three exchanges of postcards between the children in Cairns and in Toronto, their visual narratives seemed to progress from the general to the more specific; and from depicting the immediate environment of their homes and classrooms, to drawing and describing regional and even global environments.

The initial postcards centred largely around home and family, as described above. For example, Y (Figure 13 below) drew what appears to be an aerial view of her house, and the green grass in the accompanying yard. There is a

strong use of colour, but quite a basic drawing, with very few details. She described her red brick house, particularly the room she shares with her two sisters. She also mentioned playing outside with a friend.

Figure 13 – Y's first postcard



By her second postcard, Y had chosen to respond to a Toronto child's postcard, in which she drew herself with her parents, returning home to their apartment from a shop in which she had bought an ice cream cone. Y's response detailed going to the park to play on the slide and going to a shop to buy a toy. Further, she mentioned going on holidays to the snowfields [in southern Australia] and that she can brush and tie her own hair. The visual image was a lightly-drawn slide and two swings.

By Y's third postcard (Figure 14 below) the visual image was colourful and very detailed, and her story a strong description of the region and the nation. Her story began in response to a question from a Toronto child about sun in Australia, and read:

Yes there is sun in Australia. There is rain and storms and cyclones. Some trees grow flowers. We grow vegetables at my place. Do you have pumpkins? Birds eat worms there. He picks cherries in our garden and we eat them. We grow seeds for

trees. Trees can be big and have nuts. We have coconuts, mango trees and pawpaw trees.

What started out for Y as quite a general description of her immediate home environment, with a very basic illustration, progressed to more specific and detailed depictions of the home, but also the regional/national environments. Her third postcard is much more detailed and depicts a garden with different kinds of trees and fruit trees, birds, a worm on the ground, and a sun shining in the sky. While this may be due, at least in part, to responding to postcards from Toronto, it seems to also demonstrate a progression in her learning and what she was able to express through creating the postcards by drawing and storytelling.

Figure 14 – Y's third postcard



For most children, the third and last postcards were more detailed and specific, and had moved beyond the immediate environment of the house to local, regional and even national environments. For example, E. started off with a tree with leaves, a pool and a big pink ball. By the third postcard she had an

elaborate image of her family and flowers, and wrote, “I have a bicycle and I ride very fast, 100 speed. I can spell my name. I ride the bicycle down the creek and climb high trees with my brother. I have tall trees in the back yard. I have a real pony I ride. Do you have puppies? I have two puppies.”

Final postcards mentioned the environment features around Cairns, such as: the black, cold ocean, the Great Barrier Reef, Mission Beach, mountains, local streets, stables and parks. Other mentioned flora and fauna native to the area, such as coconuts, mangoes, pumpkins, cherries, pawpaws (papayas), kangaroos, snakes, dingoes and sharks; climate features such as storms, cyclones and intense heat; and activities such as boating, snorkelling, cycling and camping. A few children included other geographical areas to which they had travelled or heard about, such as the Dominican Republic, Japan and Fiji.

Discussion

This research demonstrated the effectiveness of a multimodal, arts-based approach and an authentic audience to generating rich data about young children’s understandings about their environment and environments globally. Particularly, as Barazza (1999) noted, it found drawing to be a useful tool for gaining insight into children’s perceptions of the environment. However, we felt that drawings alone may not necessarily give us as rich data, so, similar to Anning and Ring (2004), we included the stories children told about their drawings.

Using this multimodal approach, we found that even at the start of the research, the children, most of who were four years old, had quite a good understanding of their immediate, local environment. This was evident through examination of the visual images they produced and the stories accompanying the images.

However, for some children, having a multimodal, arts-based approach seemed to give them a voice that was otherwise not apparent within the classroom context. The ‘graphic language’ (Edwards, Gandini and Forman 1998) of drawing and accompanying stories seemed to assist some children to participate in ways that were meaningful to them, and from this participation they were able to communicate their wealth of knowledge.

Beyond a multimodal approach, we found that having the authentic audience of similar-aged children in another country worked well. Damoenese (2003) advocates authentic learning in collaborative communities as a vehicle for learner engagement. Most children in this research were very motivated by receiving and reading postcards from the Toronto children. One teacher reported that children looked forward to receiving postcards and many wanted copies postcards addressed to them so that they could share them with their families.

Through the three exchanges of postcards, many children's visual narratives became increasingly seemed to progress as they became more detailed and began to include more than just their immediate home environments; often depicting region, national and even global environments. This acknowledgement and awareness of their own and other environments is an important step towards environmental stewardship (Redman and Wiek in Johnston 2013). One teacher summed this up as follows:

I think they've learned to look a little bit further outside their home environment and to get excited about the broader environment outside of Cairns. I think that's one of things they have started to do. They were focusing just on their home and their backyard and now their conversations are much broader – they're talking about their camping trips, some of them are talking about the parks and rivers and freshwater – they're definitely broadening out.

Conclusion

The study concluded that arts-based methods for teaching and data collection were not only engaging, but also provided rich qualitative understandings of children's perceptions of their own and others' natural environments. While children came with some understanding of their local environment, sharing postcards deepened their knowledge of the local and regional environments and broadened their knowledge to national and international environments.

Further, a multimodal framework that incorporated multi- literacies (visual images and stories), offered children multiple ways to communicate their

understandings. For some children it even made communication possible, where they had been uncommunicative in other classroom activities.

Communication was also enhanced by having an authentic audience for whom the postcards were written. A number of children developed penpal-style relationships with their friends in Toronto, looked forward to hearing from them, and put a great deal of effort into creating postcards to send to them. As relationships and correspondence progressed, the visual narratives demonstrated a progression from the general to the more specific; and from the immediate environment of the home to the larger regional and global environments, as children become aware of “the challenges facing society and the interconnectedness of the world” (Redman and Wiek in Johnston 201, 217).

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