Unpacking a research activity: what was hidden in the panda’s suitcase?

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Metadata Record: https://dspace.lboro.ac.uk/2134/3310

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Unpacking a Research Activity: What was hidden in the panda’s suitcase?

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Context
The research activity on which this paper reports has played a pivotal role in my developing understanding of young children’s design capability over the past nine years, not just in terms of the how but also the why. Although I have referred to this activity in previous writings over the past six years, in focusing on it in this paper I seek to unpick the task as a ‘design experiment’ as defined by Gorand, Roberts & Taylor (2004), in that through experimenting with the design of a research activity, I was making discoveries about the subject of the study that I would not have done otherwise. The terms that I applied to the work during the course of the research were ‘hands-on’ or ‘plan ahead’ as ways of tackling design tasks, or ‘design-as-you-go’ vs. ‘design-before-you-start’ and these were not just labels I attached to children’s working methods but also to my own fumblings through learning to do research (Hope, 2001).

I frequently conducted a pilot study with the children in my own class, since an early lesson that I learnt about combining teaching and research was that the first time I presented a design activity, I was learning how to teach it. In order to have reliable data on variations in children’s learning, I had to develop activities that I knew well and presented consistently. This paper is, therefore, the life story of one of those tasks.

My first whole school research activity into the development of children’s design drawing was to design and make a puppet based on the story of ‘Flat Stanley’ by Jeff Brown yielded a lot of data (300+ design drawings from children aged 5-9 years) but being a human figure meant that the children were frequently drawing their current style of person representation, rather than exploring form and function. Since it was made for their own pleasure, it was unsuitable for assessing their ability to take on the needs, wants and perspectives of another person (Bailey, 2003).

A suitcase or travel bag for a toy seemed to provide a better context for design learning on a range of fronts (Hope 2006:23-4) and the class mascot (‘Pandy’) was conveniently to hand and the children were easily convinced that he needed a suitcase to go on holiday. The design activity involved asking children to draw it, make a paper prototype and a final version from coloured card. The handle of the suitcase must fit over his arm; it must not drag on the floor when he walks; his plastic mac must fit inside.

Drawing what they were going to make
The first trial of this Pandy’s Suitcase activity was with a Year 1 class in 1998. One child, who appeared to have had experience of how-to-make-books, produced an impressive drawing of all the parts he would need, with arrows indicating where they would join, and even fold lines. However, when he started making the suitcase, he ignored this drawing completely and made something similar to his friend’s far less sophisticated solution.

Me: “Chris, what happened to that wonderful drawing I was so excited about? I thought that’s what you were making. I was looking forward to seeing it.”
Chris: “Oh I forgot.”

This phenomenon is well documented (for example, Outterside, 1993; Egan, 1999; Hope 2000) and it seems strange that teachers are still expecting such young children to be able to do this (cf. Deeley, 2003). For 5-6 year olds a drawing is a completed activity. Once the pencil is put down, the emotional satisfaction can be seen on the children’s faces. It is one of completion, not of anticipation of using this drawing to go and make what they have drawn. They do not sit with it in their hand waiting to go and make the thing. New materials (card) equals new task.

Reality vs fantasy
Many first attempts, declared “Finished”, were cut-out drawings of suitcases, showing little regard to the size of the panda, even after other children who had a better idea of what to do had made considerable progress towards success. What really seemed to be stumping them was the idea that I wanted a real suitcase that Pandy could put things in, not a picture of a suitcase. “That’s the suitcase” they kept saying, showing me their cut-out drawing. “How do you get the clothes in?” I kept asking. “In there” they replied, pointing at the suitcase. I sent them to look at real bags. The most common solution to the problem of satisfying teacher was to cut out two suitcase shaped pieces and staple them together. Those who still did not understand what they were doing put the staples through the middle rather than round the sides. One girl, April, cut out two suitcase shapes, complete with handles, stapled them together and cut large holes in the body of the suitcase “So he can hold it” (see Hope, 2005).
I was fascinated. What on earth was going on in their heads?

“Through reflection and evaluation an effective teacher can consider the impact of his or her own different thinking or learning styles… before blaming the child for not learning.”

(Barnes, 2007: 139)

The results of the activity started a whole trail of reflection and evaluation. My thinking style was obviously different to theirs and I was making assumptions about what they would do and learn and what theirs would show to me about their learning that did not tie up with their understanding of the activity at all:

- The concept of making a prototype appeared to have been even harder for Year 1 children to understand than “draw what you want to make”. This was ‘making it twice’.
- They had not thought in terms of making a real thing that worked or could have real things inside. They were making things that could be pretended to be the real thing. They spontaneously drew and cut out pictures of holiday things (e.g. sun glasses) that were minuscule compared to the size of the panda.
- They were obviously happy and willing to pretend that the panda could wear them and were as confused by my puzzlement as I was by theirs.

At what age, I wondered, do children start to make real things for their dolls and action figures, and why do they not do it earlier? It did not seem to be dependent on motor skills. The reason appeared to be to do with their pre-occupation with play and fantasy. Their imagination would make up the shortfall on reality of the items they used or made to support their play. They seem to have made symbolic suitcases (Baynes, 1992:22), models of suitcases, rather than real suitcases – but then, what exactly was I asking them to make? It was not, after all, a real suitcase, but a model on my terms, not theirs.

**A working model**

Not easily put off, I tried the activity with a Year 4 class in 2000. They had little difficulty with understanding what I wanted them to do. Making suitcase fit the panda was solved by measuring. No one cut out pictures as final products and many used drawing effectively to clarify their ideas about how it would look. They were engaged in the reality of solving the task. They showed much greater flexibility in choice of technique, looked at and assessed each others’ progress and made subsequent adjustments to their own. They asked for more paper as and when they needed it. They were less inhibited about starting again if it went wrong.

I wanted to discover why Year 4 children could play the game on my terms and Year 1 could not. I wanted to find out what happened in the years between ages 5 and 9.

I decided (2001) that when I conducted the activity with Years 2 and 3 (ages 6-8 years) I would resist directly telling any child that the suitcase needed two sides but that I would prompt them to think about it by questioning: “How will he put the mac inside?” I would positively intervene in this way only if a child told me they had finished when they had only cut out a picture of a suitcase. If my questioning made no sense to them I would leave it. I decided not to record who I had such conversations with, as I thought this would be unfair because I would not know if they had been sent to ask by friends or if others gleaned the information from overhearing or by observing successful peers.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>Yr 4</th>
<th>Yr 3</th>
<th>Yr2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-sided</td>
<td>1</td>
<td>8</td>
<td>34</td>
</tr>
<tr>
<td>Flat-bag</td>
<td>50</td>
<td>59</td>
<td>53</td>
</tr>
<tr>
<td>Box-bag</td>
<td>38</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>True box</td>
<td>5</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Suitcase</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>n</td>
<td>62</td>
<td>87</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 1

As Table 1 shows, the break point between can do / can’t do appeared in Year 2. A third of the children produced a single-sided cut-out, even though other children around them were producing bags that could actually hold the mac. This was clearly what they believed they were meant to do. By Year 3 the confusion has gone. However, the tendency to produce two identical pieces and tape them together (FLAT-BAG) persists even into Year 4, showing that many children are not making allowances for the fact that the plastic mac was a bulky item and needed three-dimensional space. They relied on distorting the bag.

**Made to measure**

Measuring with rulers appeared spontaneously in Year 3 (Table 2) which also indicates a greater engagement with a real-life problem rather than one of the imagination. However, only 20% of the Year 4 children used their measuring to inform their making. This is counter-intuitive from an adult perspective. If they had measured the panda and drawn their design to accurate measurements, why did the product not measure the
lengths indicated? Did they find out in practice that their measuring was too inaccurate and would not have produced a large enough bag? No, because some were different proportions altogether and some were much smaller.

<table>
<thead>
<tr>
<th>MADE TO MEASURE</th>
<th>Yr 4</th>
<th>Yr 3</th>
<th>Yr 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured panda</td>
<td>36%</td>
<td>28%</td>
<td>3%</td>
</tr>
<tr>
<td>Used measurements</td>
<td>20%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>n =</td>
<td>62</td>
<td>87</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 2

What this indicates is that growing awareness of the reality of the problem does not happen all at once and that different skills cascade into that reality at different times in the child’s development.

Instructions for others

Those who finished in time to do so were asked to produce instructions for another child to make their suitcase (Table 3; about three quarters of each age group). Many children simply paraphrased my original instructions, presumably thinking that if that level of instruction was sufficient for them, it would be sufficient for someone else. As expected, Year 4 have greatest understanding of what was required but Year 2 appear to do better than Year 3. This indicates their lack of comprehension rather than the reverse. Year 3 could accurately repeat back the instructions. Year 2 wrote what they did, not what I thought they were going to do. Hence the higher level of ‘accuracy’ in the Year 2 descriptions. The majority did not use drawings to support their instructions.

<table>
<thead>
<tr>
<th>INSTRUCTIONS FOR MAKING</th>
<th>Yr 4</th>
<th>Yr 3</th>
<th>Yr 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions</td>
<td>75%</td>
<td>72%</td>
<td>73%</td>
</tr>
<tr>
<td>How to do it</td>
<td>53%</td>
<td>30%</td>
<td>43%</td>
</tr>
<tr>
<td>Accurate</td>
<td>43%</td>
<td>22%</td>
<td>27%</td>
</tr>
<tr>
<td>Words</td>
<td>39%</td>
<td>49%</td>
<td>25%</td>
</tr>
<tr>
<td>Picture</td>
<td>5%</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>Diagram</td>
<td>15%</td>
<td>13%</td>
<td>15%</td>
</tr>
<tr>
<td>Measurements</td>
<td>14%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>n =</td>
<td>62</td>
<td>87</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 3

Reflection (2005-7): The big idea inside Pandy’s Suitcase

Despite all its teething troubles, this activity was to become one of the assessment activities within a 15-month comparative study involving two Year 2 classes. I could use the suitcase activity with relative confidence because, I felt, I knew its pitfalls and I knew what to expect the Year 2 children to do.

The problem for the younger children in my sample was that I was unwittingly playing with the grey area between fantasy and reality.

Among other fantasies, I was asking children to
1. pretend that the class mascot was going on holiday;
2. design a pretending-to-be-real suitcase to fit a real toy panda and pretend that Pandy would put a real plastic mac in it;
3. and finally, to pretend that suitcases are made from card and held together with sticky tape and glue.

(cf. Hope 2006: 23-4)

No wonder I confused the children.

Part of the problem was that what I was asking the children to make as ‘final product’ was not a real product at all but a model of a suitcase as part of a game of make-believe about the toy going on holiday in which I arbitrarily decided which parts of the activity were ‘real’ and which were ‘pretend’.

However, I did not confuse Year 3 or 4 and half of Year 2, because they had learned to play the game and they could think within alternative paracosms. Greater experience of multiple realities, more interactively social play, understanding jokes, knowing how football and other team games work, and of teachers requiring them to criss-cross the reality/fantasy divide, enables children to think within and manipulate systems in a way that younger children cannot. The Year 1 children happily embraced the fantasy of the situation (Stables, 1992, 1997). They had no problem entering into the spirit of the enterprise. Pandy is going on holiday; he needs a suitcase. The problem came when the adult expected a ‘real’ suitcase made from ‘pretend’ materials. The rules of the game changed from the make-believe world of toys and story-land into something else that was strange and confusing.

Adult designers can, of course, leap between paracosms. They can construct a whole fantasy world around a need, a niche and a product. They know instinctively which game they are playing, what needs to work in the real world and what rules can be bent, stretched and broken. This is the stuff of good
design. It may look as if the adult designer is doing what young children do: play with ideas, have fluidity of thought, cross-boundaries, and so on. However, they are not, because young children have yet to understand the rules of the games or come to terms with the restrictions of the systems that designers and other creative people have so completely internalised that they can combine systems within paracosms and produce something new and original. This interaction between inner fantasy and outer reality, of playing the game whilst bending the rules, of being able to construct and manipulate models (whether in the head or on paper or with substitute materials) may lie somewhere near to the heart of creativity as well as of design.

Enacting designing

The enaction of design (whether modelling through drawing or mock-up) is an enaction of an analogy/metaphor/metonym of an inner image/future product; Wittgenstein’s (1969) “seeing as”. It is the manipulation of this interface that allows design ideas to develop. The designer is seeing the drawing or mock-up as if it were the real thing. It is an externalization of inner reality that acts as a tool for thought by supporting thinking through providing an external model to support the inner model.

Khatchatourov, Lenay & Stewart (2004) assert that human “sensory-motor coupling [to the environment] is always fashioned, at least virtually, by technical artifacts” which, unlike most other species, “are not irremediably fixed to the body. More precisely, technical artifacts exist in two “modes”: “in hand” and “put down”. …The back-and-forth movement between these two modes explains the radical innovative potential of technical artifacts.” (see Figure 1, adapted from Khatchatourov, Lenay & Stewart).

When the ‘technical artefact’ is a model rather than a tool, that can be ‘in hand’ or ‘put down’ (with all the metaphors that can be entailed in those two terms) a third dimension comes into play and Khatchatourov, Lenay & Stewart’s analysis is even more pertinent:

“It is not the interface that is (or is not) “enactive”: it is the human subject, using an... interface who enacts a world.

Thus, although an interface in itself never enacts anything, the role of interfaces is absolutely crucial: interfaces can permit (or not) humans to enact the world.”

Their idea of enacting a world through the mediation of a technical artifact (or a symbolic construct, a drawing or a flimsy mock-up held together with treasury tags) seems to be what is happening within an activity such as Pandy’s Suitcase. It also seems to relate quite strongly to themes raised by Bailey’s (2003) Learning to be Human in which he relates the ability to teach to the ability to see the world through another’s eyes, and also to Doyle’s (2005) thesis that learning to manipulate external memory was a significant driver in human evolutionary development.

Although this research activity was conducted some time ago, there is, for me, still quite a lot of unpacking to do from one small, imaginary suitcase for a really rather battered toy panda virtually going on holiday. I shall continue to play with the questions and issues that it has revealed.

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