What do primary children say about plants as exhibits?

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Introduction

Plants are an important part of the scenery of children's' lives. Children notice these botanical organisms in their everyday lives. Children recognise plants and name them with an everyday name or a descriptive name if they have not the 'correct' vocabulary. Failing to recall the name or to invent a satisfactory descriptive name, children refer to an unfamiliar specimen as 'plant', although the term 'plant' is used to refer most often to the flowering plants in a manner similar to the usage of 'animal' to mean 'mammal' (Bell 1981). School is not a place identified as a source of their information and pupils admit to learning little from books or the media but a lot from their own everyday observations and talking with family members (Tunnicliffe and Reiss 2000).

Children have a mental model of items, which they express through their conversations and drawings and writing. This expressed model is what we teachers have to base our assessment of that student's knowledge and understanding. Thus, the comments of pupils are important but the spontaneous comments of primary children at plant exhibits were unknown. It is important for botanical garden educators to know what pupils are likely to notice and comment about when they visit plants as exhibits so that meaningful learning interactions can be planned based on the spontaneous interest revealed in the comments of what the children comment on.

Method

The study was undertaken in a botanic garden in the south of England. Four hundred and twelve conversations were recorded from children ranging from five years to eleven year. The children came from nine different schools ranging from a private school nearby to a state school in a deprived area of north London. Many of the schools were in large year groups but they were all split by the teacher-in-charge into smaller groups of usually 6 children to go round the exhibits with an adult, the exception of one school who with three adults kept the class together. Thus, whilst occasionally one group of children was recorded for a few conversations there were many children and a wide sample of comments was gathered. Some of the conversations were including an adult, teachers or chaperone, whilst some were adult-free. The age of the children was either 6 years (year 2) eight years (year 4) or eleven years (year 6).

A conversation was taken as the utterances which started as the children came to an exhibit and close when there conversations came to an end and there was a gap before anything further was said which was about another plant. Permission for me to accompany the schools had been given in to the Education officer before the visit.

Conversations were analysed according to a categorisation scheme technically referred to as a systemic network (Tunnicliffe 1995). Essentially, a systemic network is a means of grouping or categorising things, in this case conversations, to be a parsimonious representation of the data, while preserving the relationships between categories in such a way that comparisons can be

made between groups. The network can be regarded analogously as the sets of nested boxes into which the researcher puts each part of the conversation and sections.

The main categories of the network were similar to that used for the analysis of the conversations at animals. The major categories of the network were, 'management and social comments' orders such as 'Come here', or social ones such as 'Sam.....' 'Ostensive comments' such as 'Look!' ' Where is it?' 'There!' 'Affective attitudes'; 'interpretative comments'; 'exhibit access' or 'orientation comments' in which visitors searched for or located the plants. And 'exhibit focused were another super-ordinate category comments.

Exhibit focused comments divided into 2 subordinate categories. Namely, other exhibits comments'-those about other aspects of the exhibit, such as a pond or the label and photograph, and plant-focused comments. The plant-focused category was subcategorised into six subordinate groups:

1. Interpretative comments, which included knowledge source comments such as questions and references to a source of the information proffered (called knowledge source comments);
2. Affective comments, which included emotive responses such as 'Ah!' or 'Ugh';
3. Environmental comments referring to the natural habitat or endangered status or conservation issues of the species;
4. Comments about the plants' structure;
5. Comments about the plants' physiology (equivalent to animal behaviour);
6. Comments about the plants' names. These included the everyday names, e.g. pineapple; category names such as 'plant', carnivores plant, Alpine plant, cactus; common names, for example Living Stone Plants, Giant Amazon Ian Water Lilly and occasionally the botanical name for example *Lithops* species.

Each category of comment had a number allocated to it. The numbers of the coding system are written over the relevant words. Not all the word have been categorised here for ease of reading.

39 2/4 21 29 /32

Year 2 boy: 'Oh look at these enormous lilies.

'Oh' is an emotive response, categorised as 39 and in the super ordinate category of affective comments. 'Look' is both a management command (2) as well as an ostensive comment (4) which is part of the category of Exhibit access comments showing other visitors where to look at an exhibit. The size of the plant, its dimension, is 21, part of the super ordinate category anatomy whilst lilies is a naming comment in the super ordinate category names (28) but is an everyday name (32).

Results

Most students talked about the exhibit and all but 7% of the conversations mentioned the plants. Two thirds named the plant in some way. Over half of the groups talked about an anatomical feature of which dimensions was the largest category,

A year 2 boy 'Oh look at these enormous lilies- are those enormous Lilly pads?'

Adult 'Yes'.

The results for the frequency of occurrence of main categories of conversational topics at least once in an exchange are shown in Table 1.

Table 1 Main categories of conversation

Topic	number	percentage
Management/social comments	213	52
Exhibit access	200	49
Exhibit focused	388	94
Ostensive	127	31

Exhibit focused comments embrace comments about other aspects such as labels and those elicited by the plants themselves.

Table 2 Exhibit Focused topics

Exhibit focused Topic	Number n=412	Per cent
Other exhibit	164	40
Affective	116	28
Interpretative	275	67
Environment	33	8
Plant focused	358	87
Anatomical	232	56
Functions	80	19
Naming	277	67

The anatomical features about which the students commented were leaves, 12%, flowers and fruits 13%, stems 3%, form of growth 23%, dimensions 23% and other 22%.

Function comments about the physiology of the plants were 19% with 3% about growth, 6% about food/photosynthesis and 'other 'were 11%. Naming comments were heard in two thirds of the conversations. Everyday comments were heard in 44% of conversations with 10% for common or scientific names. Categorisation of names accounted for 10% and only 2% of conversations mistakenly identified a plant. This was followed by 'Other' at 22% which covered topic such as spines, hairs. Only 19% of conversations were about functions and e were mostly comments about growing or making food, often associated with discussion at the carnivorous plants.

A Year 2 boy said, 'They eat flies, it’s meat'.

There were relatively few affective comments (which includes emotive ones of 'Ugh' and 'Ah' Such comments were generally ones of pleasure at 'pretty' flowers or disgust at a smell.

Only 8% of conversations referred to the plant's environment of the plant and its endangered status indicating that discussion of the rarity and conservation is infrequent. Plants as exhibits are far more easily seen so only half of conversations had an 'exhibit access' type of comments (e.g. Where?) and were often related to pointing something out to a peer or looking for something in particular. 'Other exhibit comments were heard at least once in 40% of conversations and the largest category was that of setting (22%) when the groups referred to an aspects of this such as the heat in the tropical house, the humidity elsewhere.

Touching plants was mentioned in 8% of conversations and the action occurred quite often. Labels were referred to by direct mention in only 5% of conversations.

What are the implications for botanical gardens and their educators?

These are several.

First of all pupils recognise and discuss salient features of plants at a relatively basic level. Eye-catching anatomical parts such as large leaves, enormous flowers or familiar items such as bananas or pineapples but in an unfamiliar context catch the attention of these visitors. The study has given an indication of what the groups spontaneously talk about even when they have a simple task. Some tasks set by teachers such as, 'Look for drip points', did provide a focus for the observations of the student so that they observed rather than looked at leaves to find this characteristic. Secondly, the study reveals that conservation of plants is not a topic spontaneously high on the agendas of these primary school groups. Thirdly organisers of visits to botanical gardens should a plan in an orientation time in the gardens when the pupils first arrive at a new site. Take them through the gallery or greenhouse twice, once for the 'look' and secondly for focused observations. All too frequently tutors, and the teachers who a brought the groups, who are familiar with the location, begin their teaching at once whilst the pupils are taking in the new sights and sounds.

Fourthly, be alert to the social dynamics of groups. Have the pupils chosen their own groups or have the visiting staff allocated them? Find out what is the situation and then build in time in your teaching for the interpersonal interactions between the group members to occur. Be alert to the stages in a field visit and plan the work accordingly with a concentrated focus near the beginning. Be alert too to the time when concentration has lapsed and other issues, such as lunch, become uppermost in the minds of the pupils.

Fifthly, plan opportunities for the discussion of moral, social, spiritual or aesthetic and cultural issues whenever possible and discuss attitudes towards the environment or pertinent local issues. Encourage too discussion about the use plants by animals including humans. Try to reinforce the idea that without plants there would be no animals as we know them. Encourage the pupils to interpret what they see from their own experiences before teaching them the science. By acknowledging and valuing their ideas and real experiences you involve students (and the adult accompanying them) in their learning. Acknowledge too that their interpretations may be of an everyday nature but value them as you discuss the accepted academic interpretation. Plan the co-operation of practical work so that tasks are shared and equipment looked after so that pupils realise this is an important part of field work.

Finally, talk about the feelings engendered during the visit and the role of plants in their own lives. What people feel about an occasion lasts a long time in their memories and can be the key to their remembering the facts.

References

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Biography

Dr. Sue Dale Tunnicliffe (BSc Zoology with botany subsiduray) PGCE and PhD (Science education) taught for many years at all levels, is a research associate at the Institute of Education London