

DEVELOPING FIELD VISITS FOR FACTS AND FEELINGS

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ABSTRACT

This paper is concerned with the analysis of spontaneous conversations between Key Stage 2 boys whilst they were observing freshwater invertebrate animals during a residential field course. The three behavioural phases, previously established for other groups in relation to zoo and museum visits, were apparent in the field situation. On arrival at the river, conversations were dominated by statements. They moved to predominantly questions in the middle of the visit and ended with more statements, as the group began to lose interest in the animals and started to think about other things. In addition to academic achievements, the conversations show evidence of personal and social skills - such as collaborating with and respecting the opinions of other people - together with spiritual and moral aspects - especially relating to death (of specimens!). The importance of tutors and accompanying teachers recognising and exploiting these phenomena is emphasised.

INTRODUCTION

THIS PAPER is concerned with biological field trips arranged for pupils to make observations on animals in the field where specimens are living in their natural surroundings and are not exhibited. It is concerned particularly with experiences of Key Stage 2 pupils observing animals in a freshwater river which was visited as part of their studies during a residential field course. There are two main aspects to the work, that of the observations made and commented on by pupils in terms of interest and the academic curriculum, and personal aspects which emerge in parallel to the academic focus.

The popularity of school trips in out-of-school settings has resulted in a growing literature concerned with research on the effect of such field trips on pupils in terms of their learning and in what they remember. Out of school visits can be highlights of the school experience for many pupils and one of the memories of school which stay with pupils well into adulthood. Falk & Dierking (1997) showed that almost all interviewees who were fourth graders (9 years), eighth graders (13 years) or adults, could recall a school trip. The vast majority of those interviewed recalled where they went, when and with whom, as well as three or more aspects of what they did.

Trips to museums have distinct stages which have been identified by Falk & Dierking (1992). Essentially they begin with an orientation phase which lasts up to ten minutes. This is followed by an intensive looking phase of about twenty minutes which runs into an exhibit cruising phase of between twenty and forty minutes. The visit ends with a leave-taking phase of about ten minutes. The emphasis may vary according to the nature of the visitor. Frequent visitors for example do not experience the orientation phase and may not have an exhibit cruising phase if they have visited to focus on a specific exhibit. It is likely that field trips have similar phases.

There are social influences on the construction of pupils' understanding of science and these influences permeate both the learning of science and its applications (Solomon,

1987). Furthermore, it is now recognised that when children are working with curriculum based activities they also display personal attitudes and behaviours and that there are also spiritual, moral, social and cultural dimensions to their work (OFSTED, 1995). Pupils must be given provision to develop their knowledge and insight into values and beliefs, so they can reflect on experiences of their own in a such a way that it develops spiritual awareness and self knowledge. Schools are expected to teach pupils the principles of right and wrong, to encourage pupils to react positively to others taking responsibility and participating in the community, and to develop an understanding of citizenship.

Lastly, pupils are to be taught to appreciate their own cultural traditions as well as the diversity and richness of other cultures. Within the aspect of school life referred to as Behaviour, attitudes and personal development (OFSTED, 1995), pupils' attitudes to learning behaviour, the quality of their relationships, including racial harmony, with peers, teachers and other adults are inspected, as well as other aspects of personal development. These two areas; spiritual, moral, social and cultural aspects, and behaviour attitudes and personal development, could be important in field trips because affective attitudes are very important in visits to animals as exhibits (Tunncliffe, 1995).

There are a number of other issues which affect the field trip experience, and hence what is said. These issues include the novelty of the location, location of the visit, the peers with whom pupils work, the curriculum objectives of the visit and both facts and feelings engendered through the experience.

The location where observations are made by pupils varies from the natural to the constructed environment, to observations in buildings created by people such as cathedrals and historic houses, museums and animal houses or greenhouses, and observations out of doors (Lock, 1998). In biological work, such studies could be made on organisms shown as exhibits in zoos and botanical gardens or on organisms in situ, on what is a true field trip, in their natural habitats - as in work at field centres where the organisms are not presented to pupils or other learners as exhibits. If the site is novel to the pupils it affects their approach to the tasks and what they learn (Falk, Martin & Balling, 1978).

The second important factor is the peers with whom pupils work. Those with whom an individual works are important to pupils. They seek either partners whom they consider can make a positive contribution to fulfilling the learning task required during the work or they opt for friendship groups (Kempa & Orion, 1996). Kempa & Orion also found that pupils did not regard themselves as beneficiaries of the geological field work which they observed but rather as contributors.

Thirdly, the rationale for the visit must be considered. Is the visit organised for an academic purpose, fulfilling a requirement of the curriculum, or is it arranged for social purposes? The educational rationale embraces the opportunity not only to observe particular specimens and their habitats, in the case of work in the field, rather than exhibits, but also to provide pupils with first-hand experience of a holistic environment. But field visits can also provide experience of social phenomena in a safe environment if they are at a zoo or a museum (Tunncliffe, 1994) or develop safety awareness and social skills in the field. The reasons teachers have for arranging to take pupils on such visits tend to focus on providing an opportunity for the pupils to have first-hand observational experience of physical phenomena such as types of landscape or flora and fauna. The educational rationale also embraces the opportunity to practice particular techniques and skills, as well as providing pupils with first-hand experience of the phenomena presented at the site which

can develop the concepts relevant to these topics which pupils are expected to learn to meet the requirements of the curriculum which they are following.

Lastly, school visits are not only concerned with facts but also with feelings. They are not only situated within the cognitive domain but also in the affective. Indeed, visits to zoos and museums have been shown (Tunnicliffe, 1995) to be strongly affective in terms of what the pupils comment about and that this category of comments, the 'affective comments' is the only category which increases significantly with the age of the pupils. It is likely that a similar situation is found in field trips. Thus, field visits are a social experience and may be important in developing attitudes towards the environment in general and the focus of the visit in particular.

Through listening and observing our pupils carefully, there are a number of aspects about them and their studies which we can learn. First of all, there is the overall content of comments made by visitors during particular types of field work. This we can ascertain from listening to what the pupils say during their work and to a lesser extent by questioning them and reviewing their work. Secondly, the comments made can be analysed according to the origins of the groups making them - school or leisure visitors for example, general studies students or biology specialists. Thirdly, the responses of different subgroups within a group can be found. Perhaps boys, or girls, or different aged groups respond with different comments which suggest a distinct focus for a particular group. Lastly, through reading the transcripts for meaning, attitudes, behaviours and social interactions, the personal interests and preferences of pupils are revealed.

METHOD

Spontaneous conversations were recorded, with the permission of the teacher in charge, and transcribed. The conversational units were then coded according to a systemic network which had been developed for a project exploring the content of children's conversations at animal exhibits and read for meaning and to identify other aspects of qualitative nature.

A systemic network is a type of analysis that changes qualitative into quantifiable data and each topic of conversation was coded according to the network developed from the work of Bliss, Monk & Ogborn (1983). A unit of conversation was defined as the 'group conversation in front of any one exhibit from the beginning of the conversation until it ceased'. There were 74 categories in this network. The conversations were from a group of boys within a mixed class.

The animal-focused category of the network had been divided into six subordinate groups which were: interpretative comments; affective comments, which included emotive responses such as "Ah!" or "Ugh" as well as comments about other attitudes - human-animal interactions (and vice versa) and welfare comments; environmental comments referring to the natural habitat or endangered status of the species; comments about the animals' structure; comments about the animals' behaviours; comments about the animals' names. Table 1 illustrates the fine-grained coding for animal observations commented upon by the groups and which is one of the most important in terms of taxonomy. After initial analysis it was apparent that the comments were grouped within four superordinate categories, the front end of the animal; the dimensions (size, colour etc.); features which were unfamiliar to the viewers and included structures such as penises, nipples, horns and claws; and disrupters, the legs and tails of animals which disrupt the outline of the animals' shape (Tunnicliffe, 1995).

Each conversation unit was categorised with the appropriate number from the networks. An example is provided below. The conversation occurred in the Reptile House at London Zoo.

71/ 20/ 71/ 20/ 71/ 20/

Boy 1: "There's one and there's one and there's one."

50/ 74/ 55/ 40/ 20/ 16/ 71/ 17

Boy 2: "See that buffalo skull over there? That's from America and there's a light bulb too".

The data were entered into a Minitab statistics package, with a 1 scored in each category of topic which was observed in a conversation unit. In order to assess the reliability of the network, when it was first used in a previous project, a second person independently categorised 20 conversational units which provided 434 instances of a category. The re-marker disagreed with 5 instances of coding but also omitted 29 possibilities in the categories of structures, behaviour and exhibit comments.

There are a great many ways of analysing conversations (Cortazzi, 1993). Here, after the conversations had been transcribed, they were also read through repeatedly and then classified into categories according to the content of the comments made by the participating children. On reading through the transcripts, however, it became clear that firstly, many of the children's conversations showed the potential that biological work has for enabling children to talk about such personal issues as welfare of organisms, relationships and death. Furthermore, it became apparent that the topics mentioned by OFSTED in the areas of behaviour, attitudes and personal development as well as some aspects of spiritual, moral, social and cultural development were present within the transcripts. Secondly, it was apparent that the content of the conversations changed in focus as the visit progressed through the stages of orientation, focus and general attention.

RESULTS

The results of studying the transcript are divided into the quantifiable data obtained from using the systemic network analysis. This provided information about the number of facts commented upon, the number of questions asked and the percentage of conversations which contained an affective comment.

The conversations reported were all amongst boys within a mixed class. However, similar patterns and content are held with mixed and all female groups. The group of upper juniors, from a day state school in Surrey, were at Juniper Hall Field Centre, Dorking as part of 5 day residential trip, arriving on a Monday and leaving on Friday. The pupils had had experience of pond dipping at school. Table 2 shows the proportions of topics which were talked about in the conversations by the river.

Facts in the conversations

Twenty-four conversations were recorded. The topics heard in most of these (88%) were concerned with interpreting what the boys saw or did. The comments were either questions or statements; queries about the living state of the animal, such as "Is it alive?" and comments about the human / animal interaction and other statements - such as "They're very difficult to get hold of aren't they?".

TABLE 1. *Part of the systemic network*

BODY PARTS	Front end	head	mention	43
			not mention	
		senses	mention	45
		not mention		
		torso	mention	44
		not mention		
	Dimensions	size etc.	mention	50
			not mention	
		coverings etc.	mention	52
		not mention		
		life stages	mention	53
		not mention		
	Unfamiliar	reproductive organs	mention	46
			not mention	
		excretory organs	mention	47
	not mention			
	other	mention	51	
	not mention			
Disrupters	locomotory organs	mention	48	
		not mention		
	tail	mention	49	
	not mention			
	Name	popular name	mention	56
			not mention	
		common name	mention	57
			not mention	
		phylum/class	mention	58
			not mention	

IDENTIFY ?	Category				
			mention	not mention	
	Category	order/family/genus	mention	59	
			not mention		
		recognise	mention	57	
			not mention		
	Compare with	human	mention	60	
			not mention		
		inanimate	mention	61	
			not mention		
		extinct animal	mention	62	
			not mention		
named animal	mention	63			
	not mention				
Mistake	other	mention	65		
		not mention			
	Mistake	misclassify	mention	64	
			not mention		

TABLE 2. *Topics mentioned whilst working in the river.*

	No (n=24)	%
Management	11	46
Social	19	79
Management/Social	20	83
Access	10	42
Interpretative	21	86
Knowledge source	16	67
Real/live	6	25
Will it hurt ?	10	42
Affective	14	58
Emotive	10	42
Environment	0	0
other e.g. equipment	10	42
Anatomy	18	75
Behaviour	12	50
Naming	19	79

Slightly fewer conversations (83%) contained either management comments - "Careful!" or "Look!" or a social comment such as "Andrew!", "Yeah?". The boys named the specimens in 79% of conversations and it is interesting to me that they used common names (not colloquial or everyday names), more than I have heard used for other live or preserved animal specimens. Presumably this was because, for example, a rat tailed maggot does not have an everyday name.

Comments referring to anatomical aspects of the specimens occurred at least once in 75% of conversations and most of these were about the size or the colour of the animal. Affective comments concerned with expressing likes and dislikes, explained in human terms or welfare concerns, occurred in 58% of conversational exchanges, and comments about behaviour, position / movement, for example, were heard in 50% of exchanges. The boys referred to other aspects such as their equipment, pebbles and weed in 42% of exchanges, and generated 'access' comments in 42% when they commented on finding a specimen, *e.g.* "There's one!", "Where are they?". No comments were made about conservation or the natural habitat.

Stages of the visit

The visit begins with the conversations starting with statements, moves to predominantly questions in the middle of the visit and ends with more statements as the group starts thinking about other things, losing interest in the animals and being concerned about different issues.

The 'novel setting' experience and associated behaviour may be reflected in the content and form of the conversations of groups. Both pupils and adults are likely to alter their behaviour as they become tired which will be reflected in the content of their conversations. Thus, there are definite phases of different activities within a whole visit, and, whilst there is an absence of data on the phases of a school visit, it is important to be aware that these phases may be present, because the nature and content of the conversations of the groups may vary according to the activities in which they are involved and the phase of the visit at which they occur. Since few studies examine the content of a whole visit, 'phase differences' may be important in explaining apparent discrepancies between studies and heterogeneity within studies.

The differences in conversation engendered as the visit proceeds are shown in the following extracts from the dialogue of three boys collecting water animals at a Field Centre. The three conversations illustrate the changes in focus of the boys as their field experience developed. The first one is in their orientation phase when they are keen and excited and getting the measure of what was required of them.

BEGINNING PHASE : Conversation 2

- teacher: "Oh what's that, in this corner here? It's swimming."
boy: "Oh yes, I don't know. Some kind of maggot thing."
teacher: "Some kind of maggot thing?"
boy: "Don't know. It looks like it's got thousands and thousands of legs."
boy 2: "It's got loads of legs."
boy: "And about 4 feelers."
teacher: "There are lots of red thingies there."
boy: "Oh yes- look Dan! Take some, here take some, there's some. Look here!"

- Quick there's one." (transferring to pot).
- teacher: "They are very difficult to get hold of aren't they?"
- boy: "Got it!"
- teacher: "You got one!"
- boy: "Yep!"
- teacher: "What's that?"
- boy: "It's another maggot. It's red."
- teacher: "Another maggot, a swimming maggot?"
- boy: "Yes."

MIDDLE PHASE: Conversation 10, in the middle of the work, reveals that the boys are focusing on their task, looking at specimens.

- boy: "What's that?"
- boy 3: "What is it?"
- boy: "Yeah, it is alive."
- boy 3: "It is a water scorpion."
- boy: "There. Got it."
- boy: "I think it's a water scorpion."
- boy 2: "Could be. Think it's a bit big."
- boy 3: "8 legs."

END PHASE: Conversation 24. One of the last conversations which shows that their attention was wandering off task and on to events happening amongst other groups of pupils.

- boy 1: "Ah, God, Katie, her boots are like filled to the top with water."
- boy 2: "Hang on. What's that?"
- boy 1: "I think it's a dead caterpillar or something."
- boy 2: "Thought it was something important."
- boy 1: "Ah! Oh no! I've lost it. It's too dark down there. Ah! no, there's something."

The overall content of the comments of these three boys was very similar to that of school groups throughout the primary age range at London Zoo, and adds confirmation to my thought that there is a pattern of comments that non-biologists make when looking at live animals with which they are not familiar.

Feelings and Attitudes within the conversations

Through reading the conversations a number of times and noting key words, as well as considering the minitab analysis, I realised that there was also a personal and social aspect to the conversations which ran alongside the factual observations and interpretations.

Examples of the topics identified are given with the following conversations.

PSE (Personal Social Education) Topic 1: Comparative observations - sharing thoughts and observations. The first part of conversation 2 provides an example.

teacher: "Oh what's that, in this corner here? It's swimming."
boy: "Oh yes, I don't know. Some kind of maggot thing."
teacher: "Some kind of maggot thing?"
boy: "Don't know. It looks like it's got thousands and thousands of legs."
boy 2: "It's got loads of legs."
boy: "And about 4 feelers."

PSE Topic 2: Co operation with others to achieve a corporate goal - working in groups - social skills. The rest of Conversation 2 illustrates co-operation.

PSE Topic 3: Pupils use their own experience to interpret what they see.

boy 3: "I saw a black thing fighting with a red thing."
boy 1: "It was a stick or something."
boy 3: "No it wasn't."
boy 3: "There are loads of those red things."

PSE Topic 4: Death.

boy 3: "There that thing was dying because it was on the rock." (puts it in water)
boy: "What thing?"
boy 3: "That thing."
boy: "No it hasn't died. I saw it move!"
boy: "There's one that one's alive!"
boy 2: "Yeah but we've got one of them, now we'll have two."

These latter two conversations provide an opportunity to discuss behaviour - fighting and dying - the characteristics of living and dead and how we recognise an organism as dead. The boys are focusing on their task looking at specimens and listening to each other's observations and opinions.

PSE Topic 5: Issues of spirituality and morality.

These topics may be discussed by the pupils and may reveal their attitudes to catching and caring for organisms as well as wider environmental issues and link with Topic 7. See Conversation 10 again for students discussing issues of spirituality.

PSE Topic 6: Tolerance of others whose actions have an effect on you.

boy: "There's something."
boy 2: "Where?"
boy: "There - it's a tiny something."
boy 2: "Ah ! God! lost it!"

boy: "There it is. There!"
 boy: "Lost it!"

PSE Topic 7: Consideration for other living things.

boy: "There are so many red things."
 boy 2: "There."
 boy: "Oh yes! That. There got it!"
 boy 2: "No you haven't. There it is. Get it back into the water!"

PSE Topic 8: Sharing task and feeling included.

boy: "Look down there. See that down there!"
 boy: "O!"
 boy 3: "These gloves aren't good."
 boy: "Oh do you want me to do some?"
 boy 3: "I ain't done any."
 boy 1: "I need to stand up somehow."
 boy 2: "Stand down here."

PSE Topic 9: Consideration for others - peers, adults, unknown people who visit the environment.

boy: "What's wrong Donna?"
 girl: "My legs."
 boy: "She's cold."
 boy: "We must be careful not to make the bank too muddy. It will spoil it for other people."

DISCUSSION

The conversations of the pupils not only contain their observations about the organisms and the environment but also their interpretations of what they see and their social communications which enable them to work together as a functioning group, sharing items and actions and listening to the opinions and observations of each other. Fieldwork does not have to involve a trip away from school; it can be done in the school grounds or yard. Moreover, if we listen to the pupils, we can find out not only what physical, behavioural and environmental aspects of the specimens and the site they attend to, but also the way their focus varies as the visit progresses and their attitudes towards the organisms and the environment. There are also distinct phases of visits to museums and zoos which have been identified and these are recognisable within field trip data.

Furthermore, the conversations reveal attitudes of the pupils which an alert teacher can develop as she or he deems appropriate. Fieldwork provides opportunities for a wider educational experience. Fieldwork provides opportunities for personal and social development (Table 3) and can extend from the school situation where more and more pupils are exploring their feelings and the rules for corporate living through 'circle time'.

TABLE 3. *Attitudes, behaviour and personal development. During school inspections the inspectors have to evaluate and report on the response of pupils to teaching and other provision made by the school in the areas of attitudes, behaviour and personal development.*

Topics reported	Potential in fieldwork
Attitudes to learning	Pupils are enthusiastic about looking at organisms; they settle to task; sustain concentration; show capacity for independent learning; persevere at task; solve problems which emerge in study; select and use relevant resources; take pride in their work; want to improve it. They have pride in the outcome; express surprise and wonder as appropriate; develop work further according to their interests.
Behaviour	Pupil behaviour in the field does not obstruct their learning. Pupils do not mistreat animals and show respect for living things and for property <i>e.g.</i> equipment; behave well in group in field; focus on task. No 'other' talking and activities (but bear in mind stages of field trip).
Quality of relationships, including racial harmony	Pupils share equipment and views; take turns; respect viewpoint of others; work in multi race and mixed sex groups. Display a positive relationship with teachers and other adults; understand rules of social discourse; respect conventions from other cultures; recognise those of their own. Are able to reflect and discuss behaviour, feelings and experiences about the task.
Other aspects of personal development	Pupils show initiative; take responsibility for animals and equipment and for the task they are assigned. Call upon other aspects of their lives to interpret what they observe.

Science work in class provides opportunities for co-operative learning, for development of independent learning, self-reliance and respect for the views, competencies and feelings of peers and other people working with the pupils. Working outside provides an extension of the groups' work in the classroom but is enhanced by the added responsibilities of being outside and the aesthetic awareness, often revealed in the field, which may develop spiritual and moral aspects within children.

Personal and social skills, such as collaborating, respecting the opinion of others and having regard for the feelings of other people, are apparent in field work but fall within the auspices of the formal education system. Indeed, they are present in informal educational work and with lifelong learning receiving a far greater emphasis in British society, fieldwork for those not in the formal school realm will develop as a very important area.

Spiritual and moral aspects are evident within the conversations of pupils. Table 4 summarises opportunities for spiritual, moral, social and cultural development within a field trip.

Field visits are an essential component of learning. They help pupils develop their knowledge and understanding of the subject together with developing their competence/expertise in the process of science. Furthermore, they provide an opportunity in which pupils can explore and develop aspects of personal and social education in a meaningful way whilst also providing a context for exploring different aspects of personal and social education or spiritual and moral education back in the classroom. Field visits are an integral part of learning biology, ecology, geography and environmental education. We, as educators, should do all we can to develop them within the school curriculum for pupils of all ages.

TABLE 4. *Spiritual, moral, social and cultural development. The provision of this through the curriculum and other aspects of school life is an important area of school provision.*

Topic reported	Potential in class
<p>Provision of knowledge and insight into values and beliefs so they can reflect on experiences of their own in a such a way that it develops spiritual awareness and self-knowledge.</p> <p>Pupils are taught principles of right and wrong.</p> <p>Pupils are encouraged to react positively to others taking responsibility and participating in the community, and to develop an understanding of citizenship.</p> <p>Pupils appreciate their own cultural traditions as well as the diversity and richness of other cultures.</p>	<p>Discussions of death and treatment of dead animals; signs of death; rituals about death; wonder at what is seen.</p> <p>No killing or mistreating of animals.</p> <p>Working with different people (not just friends); discussions of public health issues (water-borne diseases, pollution, hygiene rules to be observed).</p> <p>The role of rivers in food chains for humans and other animals; response to 'creepy-crawlies' in various communities. Touching animals. Collecting animals.</p>

Implications for fieldwork tutors

First of all, they should plan an orientation time in the field when the pupils first arrive at a new site. All too frequently, tutors, who are familiar with the location, begin their teaching at once whilst the pupils are taking in the new sights and sounds.

Secondly, they should be alert to the social dynamics of groups. Have the pupils chosen their own groups or have the visiting staff allocated them? They should find out what is the situation and then build in time in their teaching for the interpersonal interactions between the group members to occur. They should be alert to the stages in a field visit and plan the work accordingly with a concentrated focus near the beginning. They should be alert, too, to the time when concentration has lapsed and other issues, such as lunch, become uppermost in the minds of the pupils. They should plan opportunities for the discussion of moral, social, spiritual and cultural issues whenever possible and discuss attitudes towards the environment or pertinent local issues. They should encourage the pupils to interpret what they see from their own experiences before teaching them the biology or geography.

By acknowledging and valuing their ideas and real experiences, tutors involve them in their learning. Tutors should acknowledge, too, that the pupils' interpretations may be of an everyday nature but should value them when discussing the accepted academic interpretation. It is important to 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, tutors should talk about the feelings engendered during the field work. What people feel about an occasion lasts a long time in their memories and can be the key to their remembering the facts.

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