Perceptions of the Environment while Exploring the Outdoors: a case study in Belize

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SUMMARY  In Belize, Central America, environmental education efforts are gaining ground and increasing numbers of young people are participating in them both inside and outside school. This particular study explored how a non-formal field experience might contribute to the formation of environmental sensitivity, attitudes and concerns in a small group of Belizean students. Too often, studies of environmental attitudes and sensitivity employ methods (such as surveys) that fail to reveal how students react to and interact with the natural environment at the same time that they are exposed to that environment. Thus, an understanding of the formative process remains elusive. In this study the qualitative data were analysed for their relationship with three overlapping themes: (a) sensitivity to the natural environment in general; (b) attitudes toward specific animals; (c) concern and empathy. In several cases a positive change in students' perceptions could be linked to their participation in certain activities and events in the environmental education programme.

Introduction
Environmental education programmes are often multi-faceted endeavours that include efforts to develop in participants senses of appreciation and respect for the natural world. According to Fien (1992) ‘education for the environment’ includes the development of attitudes, sensitivity and concerns for the improvement and maintenance of environmental quality. Such development is ideally incorporated into larger efforts to ‘promote lifestyles that are compatible with the sustainable and equitable use of resources’ (Fien, 1992, p. 16). Iozzi (1989a, 1989b) suggested that environmental education that focused on affective learning should be incorporated into the curricula at all educational levels. He further suggested that outdoor environmental education experiences were beneficial for students in many ways, including the development of environmental attitudes.
and values. This study investigated the participation of a group of high school students in Belize, Central America, in an environmental education programme that challenged some of their perceptions about the natural environment of their country. It was an exploratory study that was part of a larger research effort to examine a range of issues in environmental education (see Emmons, 1994).

This project was based on the conviction that a local study with Belizean youth might help inform the creation of environmental education programmes based on local realities, without an over-reliance on research that focuses on student groups elsewhere. Environmental education efforts in ‘developing’ countries like Belize are often confronted with challenges different than those faced by ‘developed’ countries. Ham & Castillo (1990) point out that environmental education programmes which have been hastily transferred from industrialised countries to developing countries are often ineffective, in part due to quite different environmental, cultural, economic, political and educational realities. In many instances locally developed non-formal environmental education has made a significant contribution. Non-formal programmes are extremely important in general, particularly because the majority of the world’s population, both children and adults, remain outside the formal school systems (UNESCO, 1991). Non-formal programmes can also effectively complement classroom learning by providing students with first-hand experiences that are not as easily obtained through formal schooling.

A study of the perceptions that some Belizean youth hold about the natural environment can be illuminating. Moreover, studying students’ ideas and perceptions of the natural environment at the same time that they are exposed to that environment can reveal important aspects of the formative processes (Chawla, 1988). If affective development is considered to be important for environmental education, then a better understanding of how certain events can lead to such development is crucial. However, there are few qualitative studies of children’s perceptions of natural environments while they are in these environments. A recent work by Bixler et al. (1994) is a welcome exception, even though the data did not originate directly from the students, but from adults who were working with them.

In Belize important first steps in environmental education have already been made, both in formal and non-formal arenas. Many of these efforts have been developed locally and are not direct importations from other countries. At the same time, there is much room for improvement and expansion. Perhaps, partly as a result of these educational efforts, many young people in Belize appear to have generally positive attitudes about the steps taken toward environmental protection (see Emmons, 1994). Yet ideas persist within some segments of the population that some natural environments, the forest in particular, have little value. Most of Belize’s population is situated in the coastal areas and although these coastal towns are the centres of Belize’s growing environmental movement, many people there have little incentive or means to visit the forested interior. Rural forested areas are sometimes regarded simply as ‘bush’ and are avoided. Some people are unsure about their personal safety when visiting forested areas. For example, one family of visitors that arrived at a protected area inquired nervously about the possibility of jaguar attacks and could not be persuaded to walk on the nature trails. Ironically, many of these attitudes may not have originated in Belize, but result in part from colonial and other outside influences.

The Programme

Two small, Cockcomb female study groups were chosen education efforts formally. But groups were recruited from 40-50 miles outside the santuary, and spent the h

A variety of positive experiences were explored. The

(1) Trail hike
(2) Night vision tour
(3) Group discussions
(4) Guest speaker

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influences in earlier years. For example, mainstream publications such as *National Geographic* were at one time more likely to report negative aspects of tropical forests than positive aspects: 'The outstanding impression of Belize from the air is one of emptiness—a land untended, overgrown, unutterably lonely' (De La Haba, 1972). In the last 20 years the sentiments of the international community toward tropical forests have changed direction and many local people are left wondering why their views and actions have suddenly fallen out of favour.

This report describes one aspect of a larger study in which a 5 day educational programme at a wildlife sanctuary in Belize was developed, implemented and evaluated. The area of environmental sensitivity and attitudes, the focus of this specific report, was regarded in this study as an important learning area in the processes and outcomes of environmental action. A report on the entire study can be found in Emmons (1994).

**The Programme**

Two small groups of high school students (a total of 10) were invited to the Cockscomb Basin Wildlife Sanctuary in Southern Belize for 5 days each. All were female students in the second or third form in school and ranged in age from 15 to 20. An additional pilot group of four fourth form female students spent 2 days at the sanctuary and also provided some data for the study. Female students were chosen for the study because: (a) they are often left out of environmental education efforts and evidence pinpointed the need for them to be included both formally and non-formally (Emmons, 1994); (b) accommodating mixed-sex groups was impossible due to limited facilities. The students were openly recruited from the high schools located closest to the sanctuary, approximately 40–50 miles away. Interested students then signed up to participate. All participants understood that the programme was part of a study. The students did not necessarily express any specific interest in nature or the environment, but participated in the programme because they thought it would be a fun way to spend the holidays at minimal personal expense.

A variety of educational activities were designed to provide students with positive experiences and many opportunities were planned for students to explore the rainforest environment.

1. Trail hikes and 'river floats' to provide students with opportunities to explore and observe, as well as learn about nature.
2. Night walks to help familiarise students with an otherwise unfamiliar night-time environment. Flashlights were used to encourage focused observation of objects easily overlooked during the day, such as spiders, moths and small blossoms. The night walk was also designed to directly confront student’s fears of the forest and its real or perceived hazards.
3. Group discussions to allow students to voice their feelings about the environment and examine their attitudes toward nature. Also included during this time was the introduction of a variety of environmental concepts.
4. Guest speakers were invited to provide students with the perspective of those working closely with environmental matters, including the role of
Cockscomb in conserving the natural resources of Belize, and the importance of becoming involved.

(5) Books and other materials were made available to provide students with alternate sources of information. This included field guides and binoculars to observe and identify birds and other animals.

(6) An ‘Action Project’ was an optional activity, designed to allow students to combine their knowledge, feelings and creative abilities to teach others about Cockscomb (due to limited time, this activity was not planned for the pilot group).

The Study: background and methods

This was primarily a qualitative case study. It sought to reveal the details of teaching and learning within small social groups from the perspective of the participants themselves (see Erickson, 1986; Cantrell, 1993). Models of ‘teacher research’ (see Cochran-Smith & Lytle, 1993) were useful here, as they outline steps for on-site, systematic research by practitioners who are directly involved in a particular educational setting. This study was formative, rather than summative, with a focus on improving the curriculum and methods, not making a final judgment on their worth. To make the processes and outcomes of the programme observable, data were collected before, during and after the programme mainly through participant observation, interviews and questionnaires (the four students in the 2 day pilot programme did not participate in interviews or questionnaires).

Participant observation was guided by Spradley (1980) in particular, but also by Patton (1990). During data collection, much of the discourse from activities was recorded on audiotape and, in some cases, on videotape as well. Participant observation methods often make use of field notes, but this was not always possible. In this study the researcher and the assistant were full participants and had to perform duties as teachers and leaders which left little time for writing notes. The transcribed participant observation data were analysed using episode analysis of transcribed data (McKernan, 1991) and content analysis of documents (Patton, 1990). Recurring themes across responses were noted and meaningful categories were drawn from them for comparison (Spradley, 1980; McKernan, 1991).

Questionnaires were an additional source of information both before and after the programme. Numerical data from the questionnaires could be compared and contrasted with data collected by other means. A more useful aspect of the post-programme questionnaire was the group discussion that followed. Students had the opportunity to clarify, elaborate or correct their responses during these discussions, which were audiotaped and later transcribed and analysed in the manner of the participant observation data.

All participants were interviewed on the first and last days of the visit. Students responded to several pre-set questions in an open-ended fashion. The interviews lasted 10 minutes each and were audiotaped and later transcribed. Recurring themes across responses were noted and meaningful categories were drawn from them (McKernan, 1991). The themes that emerged from interviews were also compared and contrasted with those from other data sources.

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Other types of data were also collected, some in combination with participant observation and some by other means. Student work was collected including rough drafts and final products of projects, letters and entries in the wildlife sanctuary visitor’s log. A variety of other recorded material was also collected. In place of written journals and written field notes, notes were recorded daily on audiotape by the teacher. These notes were supplemented by teacher ‘self-interviews’ and discussions between the teacher and the assistant. This data helped to fill in the gaps left by field recordings and provided a forum for the teacher and assistant to voice their perceptions and concerns.

Themes in Environmental Sensitivity and Attitudes

In the analysis the data were examined for their relationships to three overlapping themes in environmental sensitivity and attitudes: (a) sensitivity to the natural environment in general; (b) attitudes toward specific animals; (c) concern and empathy. Each of these areas is discussed below, with examples provided from the data. (Pseudonyms are used throughout the report.)

Sensitivity to Natural Environment

A sensitivity to the natural environment was defined in this study as an empathetic outlook toward the natural surroundings in general. It includes a basic awareness as well as a valuing of the environment and one’s own position within it. One of the most obvious patterns to emerge during the programme was an increase in positive remarks by the students that apparently corresponded to fewer expressions of ‘fear’ by the students. Elements of ‘fear’ as expressed by students included fears of the forest in general, of getting lost, of unknown or vague dangers (as when ‘the bush shakes up’) and of the night-time environment (fears of specific animals will be discussed in more detail later). On the first day students had rather negative ideas about the forest and being in contact with it even if they denied that they were ‘scared’. Most students would not consider venturing out on a trail alone the first day. These feelings appeared to be strongly accompanied by fears of certain animals or of getting lost, as the following dialog from the first group shows. One student, Nora, declared she would walk by herself in the forest if there was a specific purpose, but it was clear that it was not something she felt she would enjoy on the first day:

Teacher: What’s the most scary thing out here ... ?
Cecilia: Snake.
Karette: And tiger [tiger is the local term for jaguar]
Nora: Nothing, Miss.
Julia: I don’t think I’m afraid of nothing, but huh! [negative expression].
Louise: Once I’m in [the cabin] tigers can go all around.
Karette: When I go with the crowd [I’m not afraid], but when [I’m alone], I’m afraid....
Teacher: And how about if I suggest you go on the trail by yourself, who would do that?
Julia: What!
Student: No way!
Julia: We'd be lost.
Louise: If all of us [go together], yes.
Teacher: And one of you?
Louise: No, no, no.
Nora: If I know the way, yes.... If you left something by the end of the trail and you sent me for it I could go, but if I know where I'm going. If I don't know [the way], I'm not going!

The second group of students discussed the possibility of forest spirits, as well as of dangerous animals:

Carol: We hear about Tata Duende! [a forest spirit]
Teacher: What is that?
Maria: A little man with eyes.
Carol: And one named Lasoosia, with two titty.
Maria: Long breasts, long hair, that's what they say.
Teacher: Any other stories?
Carol: Tigers will eat you.
Maria: That's true!

Fears of the night-time environment were expressed particularly before and after the first night. Many students were afraid to go to the outhouse without being accompanied by the teacher. One student could not sleep because she was 'afraid something might come through the window'. Students in one group asked if they could keep the light on all night, but this was not allowed due to limited battery power.

By the fourth and fifth days of the visit various types of evidence indicated greatly reduced fears. Figure 1 provides evidence of change between several pre-and post-programme questionnaire items. The number of students who expressed a desire to walk alone in the forest or to walk in the forest at night increased during the course of the programme. Students were also less likely to express that walking in the forest was 'more dangerous' than walking in a town or city.

The follow-up discussion served to better illuminate students' questionnaire responses. For example, students in the second group discussed their responses to the item 'It is more dangerous to walk in the forest than in a town or city'. Some students remained apprehensive about walking in the forest, but others provided thoughtful ideas on why the forest was less dangerous: 'Because the animals won't hurt people in the forest. Its better to walk to walk in the forest, depending what kind of animals' and 'I think its not dangerous, because when you ... go to a new place, the moment you go, if people don't like you, don't like how you look ... they try to hurt you. But in the forest I don't think you get animals like that!'. Other evidence suggests that fears associated with the night-time environment were greatly reduced after students participated in night walks and outdoor games at night. Excerpts from the teacher's notes indicate theses changes:

The first night they were afraid to go to the outhouse by themselves, and this time they were running all over the headquarters in the dark, without flashlights, hiding in the bushes with the ants and insects.


Students also felt more comfortable in the forest and were not as opposed to the idea of walking alone. On the fourth day Louise shared a story about when she was rudely left behind by the others on the trail and became more comfortable with the idea of walking by herself in the forest:

... at first when I never saw the girls, I guessed I must be lost! And then I walked in the trail and I looked up. I never even knew that I was by myself ... and then I heard you say 'Louise!' and I jumped, because I was looking for birds.

Other students expressed at the same time that they would not mind walking on the trail by themselves. Cecilia, however, had a strong fear of snakes and said she would not walk alone.

Additional data also suggest that students had positive perceptions by the end of the visit. All students contributed to the Cockscomb visitor’s log on the last day and a passage from one student is typical: ‘The Cockscomb Basin has a special beauty in itself. I enjoy being here, walking in the bush and hiking to the waterfall. I like it in the morning to be [woken] up by the birds’.

Figure 2 is a type of process/outcomes matrix that documents the changes in students as they became more familiar and comfortable with the natural surroundings. The figure summarises how negative ideas about the forest (on the left) were reduced and more positive ideas became prevalent, with examples on the right side. The centre box summarises the types of instruction that appeared to contribute to these positive changes (role modelling, opinions of other people and direct experience). Conceptual and recreational influences that appeared to
Examples of Original (Negative) Ideas

Forests are “bush” and contain frightening elements: “I was afraid something might come through the window.”

Dangerous and bothersome animals live in forests: “Snakes crawl in there.”

Forests are not liked: “Some [people] don’t like bush.”

Conglom Grasp Relationships:
Students learn that Cockscomb provides a safe place for plants and animals. It provides Belize with an area where the environment is relatively intact.

Instruction

<table>
<thead>
<tr>
<th>Role Modeling</th>
<th>Teacher leads students on hikes in natural environment, points out things in nature that interest her, or that she “likes.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinions of Others</td>
<td>Students hear the ideas of other students and teacher: what looks, sounds, or smells interesting to them. They hear what others like or dislike, and why.</td>
</tr>
<tr>
<td>Direct Experience</td>
<td>Students are aware of their surroundings and notice what they like about them. They enjoy the peaceful sights and sounds of the forest, and focus on specific elements of interest</td>
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</tbody>
</table>

Recreational Relationships:
Students utilize the natural attractions in a recreational manner. They enjoy the natural surroundings and find them physically challenging.

Examples of Positive Outcomes

“This one has ten different colors, this looks pretty.”

“It smells sweet, like perfume.”

“The water’s pretty, gal!”

[Entry in visitor’s log]: “The sanctuary is a lovely and fantastic place to visit... While going up the river path you can stop along the way and listen to the different sounds that might come from the different animals of the forest... It’s a very beautiful place for people of [our] own country to come and visit.”

“All the wonderful birds would just come and sing and you will feel merry.”

Fig. 2. Process/outcomes matrix, sensitivity to the environment in general.
interact with the affective experiences are summarised in two boxes at the bottom of the figure. Such data indicate that when students have these initial positive experiences in natural areas, especially when guided by role models, they become more aware of and sensitive to the natural surroundings.

*Attitudes about Specific Animals*

For purposes of this study, an environmental attitude was defined as a positive or negative disposition or feeling about an object, issue or situation related to the natural environment, in this case animals. Some animals were ‘liked’ or admired by students, while others were disliked, feared or held in suspicion. Types of birds, fish and monkeys were held in a positive light, but in a very ‘humanistic’ sense (see Eagles & Muffitt, 1990). When students were asked what kinds of animals they ‘liked’ they most often mentioned animals they would like to have as pets. Wild species mentioned were typically parrots and monkeys. Students in both groups related the story of a man from their town who had captured a baby monkey. Some appeared eager to defend such a capture, insisting that the man ‘just found the baby’, while others acknowledged he had chopped down a tree to get the animal. Students also reacted positively to the sight or mention of animals in the wild. They were excited about watching large fish and eagerly recounted chance sightings of mammals. Birds were observed with great interest by some students, including some who claimed they previously paid little attention to birds (‘I used to see a lot of birds, and I was never interested to look at them ... but now, every time I see a little bird I want to see what kind and go check in the bird book’).

Sentiments about certain animals, such as porcupines and bats, ranged from fear and suspicion to interest or curiosity. For example, a student in the 2 day pilot group told about a previous experience with a prehensile tailed porcupine:

Cheryl: We saw one cross the road and killed it.
Teacher: Why did you kill it?
Cheryl: It’s dangerous!
Pat: It’s dangerous to dogs.

The idea that prehensile tailed porcupines are ‘dangerous’ appears to be widespread, even though they are rarely seen, are quite shy and cannot use their tails in defence. For instance, a local employee at the Sanctuary also stated that porcupines are dangerous. However, students in another group expressed sincere curiosity about porcupines and asked questions in an attempt to identify how dangerous they really were:

Julia: I sever saw a porcupine as yet ... if you see a porcupine, will it let go the prickles at you?
Teacher: It doesn’t really let them go, but it sticks on you. Its just a defence, so the [jaguars] don’t eat it. But [porcupines] are not that dangerous. If you don’t bother them, they don’t bother you.
Nora: Can they throw [the quills] at you?
Teacher: They can’t throw them, no. Only if you touch them....
Nora: If you touch them, then what, they throw them at you?
Teacher: No, they don’t throw them, they might stick, like a thorn.
Interestingly, students in the same group that had expressed so much interest about porcupines regarded bats with fear and suspicion:

Nora: In the day they hang up, but in the night you see them and they fly around and suck you.

Karette: When they suck you, you don’t feel it because of the breeze.

Yet students in the second group were quite curious about bats and asked questions while looking at a close-up picture of a bat:

Loreta: Is this the head?
Teacher: Yes.
Maria: And the wing.
Teacher: It’s not very often you can see a bat like that, and really study it.
Loreta: They don’t come out in the day?
Teacher: No. They are night animals. They are the only mammal that can fly.
Loreta: And they can hear good too, not true?

All students showed much interest in jaguars. Some of this interest was sparked by the official name of the sanctuary, which is ‘Cockscomb Basin Wildlife Sanctuary and Jaguar Preserve.’ At the same time, jaguars were greatly feared by some students, particularly at the start of the programme. Some of the more rural students had direct experiences with jaguars. Pat, a student in the pilot group, told a story of how a ‘tiger’ had eaten the dog ‘off of the back verandah’. The group talked about the occurrence of the animals and the dangers they presented:

Teacher: So you live in the country where there are more jaguars?
Pat: Yes, but the hunters have hunted, so now there are less tigers
Teacher: So is that good or bad? Should there be less tigers or more tigers?
Pat: Well, they haven’t harmed me as yet. If they harm me, I think they should be killed.
Dolores: I think the tigers should be in a place like this.
Cheryl: Yes, where people can’t get attacked.
Dolores: I don’t think they should kill [the tigers].

Recent signs of jaguars were seen by students in all groups during the visits. A few students found this frightening, but the majority appeared to feel quite safe with the group. Some expressed much interest, such as Loreta, who later wrote about what she learned: ‘The male jaguars claim about 11 to 16 square miles as their territories, and usually scratch trees to mark it’. Since most of the students stayed for 5 days at Cockscomb, they became much more comfortable and were less likely to express fear of jaguars. Instead, students often started out their hikes with the chant: ‘I want to see a tiger’.

With some of the most disliked or feared types of animals there were good opportunities to see attitude changes resulting from the visit. The most obvious changes were apparent in students’ attitudes about snakes. Early in the programme snakes were generally regarded with both fear and suspicion. For example, students in the first group recounted myths about snakes, for example that a pregnant woman could kill a snake by looking at it. Although students
had opportunities to learn about and observe snakes, suspicion was inadvertently reinforced with this group of students by a taxi driver who told students about a snake that could ‘sting with its tail’. This misinformation was later ‘corroborated’ by a staff member at Cockscomb and the teacher had to make a great effort to try to convince the students that the story was not true. On the whole, however, students were less likely to believe that most snakes were dangerous and were less likely to express the view that snakes should be killed after the programme. Figure 3 provides pre and post-programme questionnaire data of students’ feelings about snakes.

Again, some of the most revealing data came from the discussion following the post-programme questionnaire. Some of the most fearful students showed little change. Others were able to provide thoughtful reasoning for leaving snakes alone:

Carol: If you kill it, you’re not eating it. If you don’t eat it, why do you kill it? So set it free....

Loreta: If it’s dangerous, you won’t kill it?

Teacher: No, I’ve seen dangerous ones before. They have their purpose [in nature].

Carol: I don’t see any snake that stands up to somebody. They run from you when you run at them.

All students had opportunities to observe snakes. Those in the first group saw several small snakes on a night walk and students in the second group were introduced to two snakes that had been captured by a biologist. Students in the pilot group had a brief encounter with a snake during a hike. One student expressed how she had changed her feelings about snakes when discussing her responses to the questionnaires:

On ‘would you kill a snake’ I said ‘yes, I would’ [on the pre-programme questionnaire]. But now, I [don’t agree] because I notice they don’t fool with me.

On the other hand, this ‘amnesty’ was not extended to dangerous snakes:

Miss, they got some snakes that like to chase people. If all kinds of
snakes were snakes that chase me, I’ll slit their throat, I’ll surely kill them.

In the second group Loreta remained cautious about ‘dangerous’ snakes during the post-programme discussion, but she also showed a great deal of interest when seeing non-venomous snakes up close. She asked several questions and was not fearful of touching snakes brought by the biologist. Two other students in her group were very frightened, however. One of them, Carol, later lost her fear and reported that touching the snakes had been ‘fun’. Figure 4 is a process/outcomes matrix which summarises such positive changes about snakes. On the left are opinions that were typically expressed by students at the beginning of the programme. Later in the programme more positive statements about snakes were heard (on the right of the figure). Contributing to the changes appeared to be direct experience with snakes, role modelling and opinions of other people with examples in the centre. Cognitive and recreational influences also appeared to play a role and are summarised in the lower boxes.

Participant observation data also show that in some cases students’ attitudes about other animals improved during the programme. On the first day students in the second group expressed negative attitudes about frogs and toads:

Teacher: What about frogs, toads?
Loreta: Huh! [negative expression]
Carol: They stink!
Maria: They talk a funny noise.

A few days later on the night walk these students examined giant toads and expressed interest in their behaviour. They observed the texture of the skin and looked around the area for additional toads. In a similar manner, a student in the first group appeared to gain more positive feelings towards spiders. On the third day of her visit she declared about spiders ‘I don’t like them at all’. Later, when preparing to go on a night walk, an adult showed her how to look for the sparkling reflection of crawling spiders. While practicing this new skill, she excitedly called to the teacher: ‘Miss, [he] showed us how to look for spiders!’.

**Concern and Empathy**

These notions included feelings of concern for the environment and related problems and feelings of concern and empathy towards animals. Most students did express some level of concern and empathy at the start of the programme, but it was often ill defined and was expressed in very general terms. In addition, as some students gained cognitive knowledge of environmental problems in particular, they were more likely to express concern.

In the pre-programme interviews students were asked about the effects of deforestation. They were likely to mention the effects on animals and of environmental problems like erosion: ‘There would be erosion ... the trees and the jungles are where most of the animals live.... So if they cut them down, I think they won’t have any home to live in’. At the same time, some students did not feel a sense of personal responsibility for dealing with such concerns and suggested that problems belonged to the perpetrators (‘I don’t have any re-
### Examples of Original (Negative) Ideas

Snakes are dangerous, ugly, and frightening: “I don’t want to see nothing like a snake.”

Snakes are surrounded by superstition: “They say a pregnant woman can kill a snake [by looking at it].”

All snakes should be killed: “I would kill it.”

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### Instruction

<table>
<thead>
<tr>
<th>Role Modeling</th>
<th>When snake is spotted, teacher moves toward snake, rather than away. Teacher shows excitement but not fear.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinions of Others</td>
<td>Teacher mentions she saw a “pretty” green snake; teacher tells students that they would be “lucky” if they saw a snake.</td>
</tr>
<tr>
<td>Direct Experience</td>
<td>Students see snakes and move close to watch them. They see snakes trying to crawl away from them.</td>
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### Examples of Positive Outcomes

“Like snakes... now that I’ve come [to Cockscomb], I see that they don’t harm nobody. I would leave it and let it go.”

“I don’t feel to kill it, I would let it go.”

“I want to see a big, fat snake”

“I want to see a pretty one [snake].”

“It looks pretty.”

Touching the snake was “fun.”

“I want to see the color.”

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**Fig. 4. Process/outcomes matrix, attitudes toward specific animals (Snakes).**
sponsibility for that, that’s their problem’) or to the people affected by the problems. Some students made a loose reference to the responsibility of ‘society’.

In discussing concerns about animals, several students did not know what the terms ‘endangered species’ and ‘extinction’ meant before the programme, but were nevertheless likely to suggest in pre-programme interviews that animals should not be harmed: ‘If you see an animal, don’t shoot it, make it live. Maybe someday it could reproduce and build a home’. As the programme continued for each group, new types of dialogue became apparent. While a large change in sentiments was not necessarily apparent, there was a suggestion of some growth or at least a rethinking of opinions. In the first group students discussed what would happen to ‘the animals’ if deforestation occurred:

Karette: If [the forest is] cut down here the animals migrate from here and go somewhere else.
Cecilia: But some of them would be dead.
Louise: And some of them would go into other countries.
Karette: That’s why I say they migrate, they move.
Louise: But you know, Karette, maybe you understand it the wrong way ... [if] they cut down here that they just could go and find a next place? But some of them [would be] dead out of that process there.

In the second group students had a similar discussion, but empathetic feelings toward animals were especially apparent in the words of some:

Carol: [The animal] can go, yes, but where he might want to go might be too far and maybe their own place they love....
Maria: Maybe they have younger ones.
Loreta: But they can go somewhere else!
Carol: They can go, but maybe its too far for them....
Maria: Like me, where we stay is a market. When there is no more market we have to go. And then you have all equipment and things there, its hard to buy back everything
Loreta: They don’t have [equipment]!
Maria: No, but they have nests and that gives them trouble to make.

On the last days of the programme students in both groups mentioned that the programme had made a difference in their concerns about the environment: ‘[the visit] changed me a lot because it taught me how to protect the environment and protect the animals and not be cruel to them’. The following dialogue also suggests that students felt the environment was important:

Karette: Now where I see that the environment is more important than, not exactly more important than your other works, but still....
Louise: They overlap each other, Miss.
Teacher: They are related, is that what you are saying?
Louise: ... To me, they come in one. The environment needs you, and you need your environment.

Data from the pre- and post-programme questionnaires also reflected student growth in empathy toward animals. Figure 5 shows that students were more likely to suggest that wild animals do not necessarily belong in a zoo. Students
ed by the 'society', v what the imme, but at animals ve. Maybe continued for change in ne growth ssed what

Item: I would like to have a tiger skin in my house for decoration  n=10 students

<table>
<thead>
<tr>
<th></th>
<th>never</th>
<th>not sure</th>
<th>probably</th>
<th>definitely</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-program</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>post-program</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Item: The zoo is the best place for wild animals to live  n=10 students

<table>
<thead>
<tr>
<th></th>
<th>agree</th>
<th>disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-program</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>post-program</td>
<td>1</td>
<td>9</td>
</tr>
</tbody>
</table>

Fig. 5. Questionnaire responses, empathy and concern.

also showed that their feelings about owning a jaguar skin had changed dramatically. Students in the first group discussed on the last day why they felt that a zoo was not a desirable place for wild animals:

Nora: When they're in the zoo they don't get proper food. Well, they get food, but maybe some of them don't like it.

Cecilia: They are not free.

Julia: They can't run about.

Students were also eager to express their opinions on owning a jaguar skin: 'Now that I come to the sanctuary and learn ... I would say [it] is spoiling nature because the tiger belongs in the forest'. Another student said: 'I would watch [the jaguar] to see what it did every day, and I would take pictures of it to put in the house'.

Again, influences during the programme appeared to contribute to the growth in students' feelings of concern and empathy. The opinions of other students, the teacher, guest speakers and various sanctuary staff appear to have had the largest influence on students. For example, a local youth activist spoke to students in the second group about his own concern for the environment and his commitment to help solve environmental problems:

I see myself as somebody preparing this world for the future. When I mean the future, I mean the children that are to come... It's much more important that you ... devote your time to cleaning up your environment, planting a tree, than going to church and making a donation.

This guest speaker also challenged the students to become involved in environmental protection themselves and suggested that they had a 'responsibility' to do so.

Direct experience also appeared to play a role in students' development of concern and empathy. Contact with the natural environment at Cockscomb and new perceptions of the aesthetic qualities of the forest might have given students new reasons to be concerned about problems such as deforestation. Students expressed on numerous occasions what they enjoyed about the natural environment. In addition, cognitive learning also appeared to play a role in the formation of students' feelings of concern. For example, a discussion about hunting animals for their skins led to talk about the legality of doing so, particularly in a protected area. Students could then process this knowledge.
with existing empathetic feelings and form new, stronger ideas about killing animals for their skins, as suggested by data presented earlier on jaguars.

Discussion

For the Belizean students this environmental education programme appeared to be very positive. In the short term at least, negative perceptions did not appear to be reinforced, as has been reported in research from other countries (for example in Bixler et al., 1994). The length of time that students spent at Cockscomb (5 days for most) appeared to be important in the reduction of negative perceptions of the environment, including fears. For instance, negative perceptions and fears were recorded much more often during the first part of the programme than during the latter part of the programme, when positive associations appeared to increase. A shorter environmental education programme may not have had the same effect. In addition, the programme did not completely remove students from all that was familiar to them, as might a nature experience for inner city children in the USA, for example. Bixler et al. (1994) provided a literature review on this theme and suggested that extremely new and novel conditions may hinder any educational agenda: 'Persons with no previous experience in wildland areas will be overwhelmed by the sheer number of unrecognizable objects, smells, sounds, and situations even when no immediate dangers, such as snakes or killer bees, are present' (p. 25). This did not appear to be a problem for the Belizean students. Although the Cockscomb environment certainly was novel for students, their own experiences in rural Belize provided them with a link to this new situation.

Positive attitudes of the Belizean students toward certain types of animals were not unlike those of young people elsewhere (see for example Westervelt & Llewellyn, 1985; Eagles & Muffitt, 1990). 'Humanistic' attitudes toward such animals were common, with feelings of affection and interest in animals considered appropriate as pets. In a similar manner, young people in other countries have often exhibited negative perceptions of reptiles, amphibians and invertebrates such as insects and spiders (Kellert & Westervelt, 1984; Westervelt & Llewellyn, 1985; Bixler et al., 1994; Simmons, 1994). In such studies snakes are generally most often mentioned as a disliked or feared animal. The Belizean students also expressed many of these perceptions about snakes and other animals, but the positive shift that was apparent over the course of the programme suggests that students were receptive to new, and positive, information and experiences.

Previous studies have also looked at feelings of concern and empathy among young people. Eagles & Muffitt (1990) reported strong 'moralistic' feelings of Canadian youth toward animals. Like the Belizean students, many objected to cruel or exploitative treatment of animals. While an outdoor camping experience did not appear to increase these ideas in the Eagles and Muffitt study, the Belizean students' participation in the 5 day programme appeared to have a positive effect. However, because some of these attitudes were generally present before the programme, it is difficult to determine how much growth can be attributed to the environmental education programme itself.

Unfortunately, few studies appear to have reported how outdoor experiences might contribute to a general concern about the environment. Some studies deal with conci (1994), for of environ more envi
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with concerns only as a 'predictor' of environmental behaviour. Dresner & Gill (1994), for example, found that a 2 week nature camp experience increased levels of environmental concern in students which appeared to result in them showing more environmental behaviour than previously.

Some limitations of this study must be noted. First, there was no follow-up to the study after students returned to the daily routines of their normal lives. While the data suggest that the programme had a positive influence on sensitivity and attitudes during their participation, evidence is not available to suggest that these perceptions were retained. Second, data were collected from a relatively small group of Belizean students. Except for the pilot group, all participants attended the same school in a small town. Students from other towns might have entered the Cockscomb setting with different sets of expectations and might have interacted differently with the teacher, each other and the environment. Finally, two aspects of the questionnaire administration may have affected the results. For practical reasons, the written pre-programme questionnaire was administered to both groups at the same time, which was 1 week before the first group arrived at Cockscomb and 2 weeks before the second group arrived. In addition, due to printing problems, the post-programme questionnaire had to be administered orally while the students wrote their responses. However, the detailed qualitative data provided by the post-programme discussions helped to counter some of the difficulties encountered in questionnaire administration.

In conclusion, there is agreement with Chawla (1988) that studies within natural settings are important if environmental educators are to understand how outdoor experiences formatively contribute to the development of environmental attitudes, sensitivity and concerns. Surveys are an inadequate tool for understanding why individuals respond as they do and for understanding how experiences and events can directly contribute to change. In this study the data from questionnaires served primarily to highlight and illustrate the data from other sources, particularly the actual observations of students as they interacted with the natural environment.

Through direct experience and through the influence of role models and the opinions of others, students in this study were able to experience more positive aspects of nature and to reduce negative associations. There is also evidence that the programme provided them with numerous opportunities to develop feelings of concern and empathy as related to the environment. For most students the positive experiences they had in the forest were first-time experiences. Programmes that encourage such positive experiences in nature can contribute to an 'education for the environment' by providing a forum for students to link their own lives to what is happening 'upstream' from their coastal residence. Through non-formal, outdoor experiences students can gain a better understanding that the protected areas of their country exist not merely to earn tourist dollars, but that they have an intrinsic value that can be enjoyed and protected by local people as well.

Notes on Contributor
Katherine M. Emmons, originally from California, USA, is an environmental education consultant. Her research in Belize was conducted as part of PhD work.
REFERENCES


SUMMARY

and challenges. It looks supported by water pollution/environmental stresses coming from increased human activity and increasing degree of urbanization. It is crucial to change programmes and curricula to face these challenges.

Introduction

Hong Kong schools sin travel destinations face environmental pressures. As a result, there are also pressures from the environment. A rethink in occurrence; However, change programmes

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