Birds in the school yard: the impact of a science inquiry unit on local bird ecology on the environmental attitude and knowledge of Grade 4 Trinidadian students

UWI BIENNIAL CONFERENCE IN EDUCATION

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Vision – A green T& T

- National Environmental Policy (NEP) vision for T&T

"in which all persons treasure the environment and voluntarily use its resources wisely to ensure its protection, conservation, and restoration, so as to equitably meet the needs of present and future generations and enhance the quality of life" (EMA 2009).

Copper Rumped Humming bird and a powder puff flower

Barriers and possibilities

- Teaching environmental concepts - textbook, pictures.
- survey of primary education: 50% of teachers found Science difficult to teach,
- 10% of schools believed they had an adequate supply of materials
- 25% of elementary schools had science rooms,
- Experiments/demonstrations as effective in understanding science, while examples in textbooks were considered the least effective. (Niherst survey 2011)

A laboratory outside the door

- Can the outdoor environment and the community be a resource for teaching science ?

Mango Tree with strangler fig
Asa Wright

Effective Environmental Education

- Builds awareness and knowledge which could be used collectively or individually in finding solutions to the world's environmental problems (Belgrade Charter 1975).
- Outcomes - knowledge, skills, attitudes, values and participation,(Tbilisi Declaration 1978).
- First hand experience of their environment (May 2009).
- Naming and Identification - identify indigenous plants and animals with the same expertise that they identify their brand name products, (May 2009).

Place based education
School yard ecology

- Enriching, learner-centred, community based environmental education
- Cost effective: uses the physical and local resources of the school and its community.
- Cox-Petersen & Spencer 2006: Access to Science and literacy through inquiry and school yard habitats. *Science Activities, 43(2), 21-27.*
- McCaffery,R. (2012). Birds across borders. *Science and Children, March, 31-35*
- Veal & Nagy 2012: Sweet Grass Science. *Science and Children, March, 46-49.*
- Wells &Davey-Zeece 2007):My place in my world; literature for place-based environmental education. *Early Childhood Education Journal 35)3,. Dec.*

Project goal and questions

- Goal:
- To investigate the feasibility and effectiveness of inquiry based school yard science.
- Questions:
- To what extent will there be an improvement in primary,urban, Grade 4 Trinidadian students' knowledge of their local birds before and after an outdoor environmental science project?
- To what extent will there be a change in students' environmental attitudes and affinity before and after an outdoor environmental science project?

Method

- Sample: 18 boys, 10 girls, Grade 4 – urban, low income community
- Implementation of a module on local bird ecology.
- Pre and post test of environmental attitudes and knowledge of local birds.
- Qualitative measures – observations of journal entries, behaviours, group interviews, conversations, participatory maps.

Questionnaire

- Environmental Attitude and Awareness Survey (EAAS).
- (Larsons, Green and Castleberry 2008).
- 23 items – Likert scale – modified – pilot tested

- Environmental attitudes: – Eco affinity Eco awareness.

- Eco Affinity - how one interacted with the environment. Section c
- Eco- awareness - knowledge of the impact of actions on the environment. Section A&B .

- Bird knowledge – 7 item short answer questionnaire - assessed students' knowledge of local birds' names, habitats, endangered status, favorite birds, and students' experiences with local nature centres.

Local Bird Ecology Module

- 8 teaching sessions – Sept 19th -Nov 14th 2012
- Creating a bird centre – flowers and feeders
- Naming birds – observing birds in the school yard
- Defining habitats and adaptation – finding habitats in the school yard.
- Bird beaks and adaptation – The beak game
- Field Trip to AsaWright
- Slide show and discussion of the field trip
- Conservation – The impact of trash on animals:
- Short story: Bernadette and the Blue and Gold Macaws: Conservation activity

Data analysis

- Questionnaire: two tailed, paired t test: p=0.05

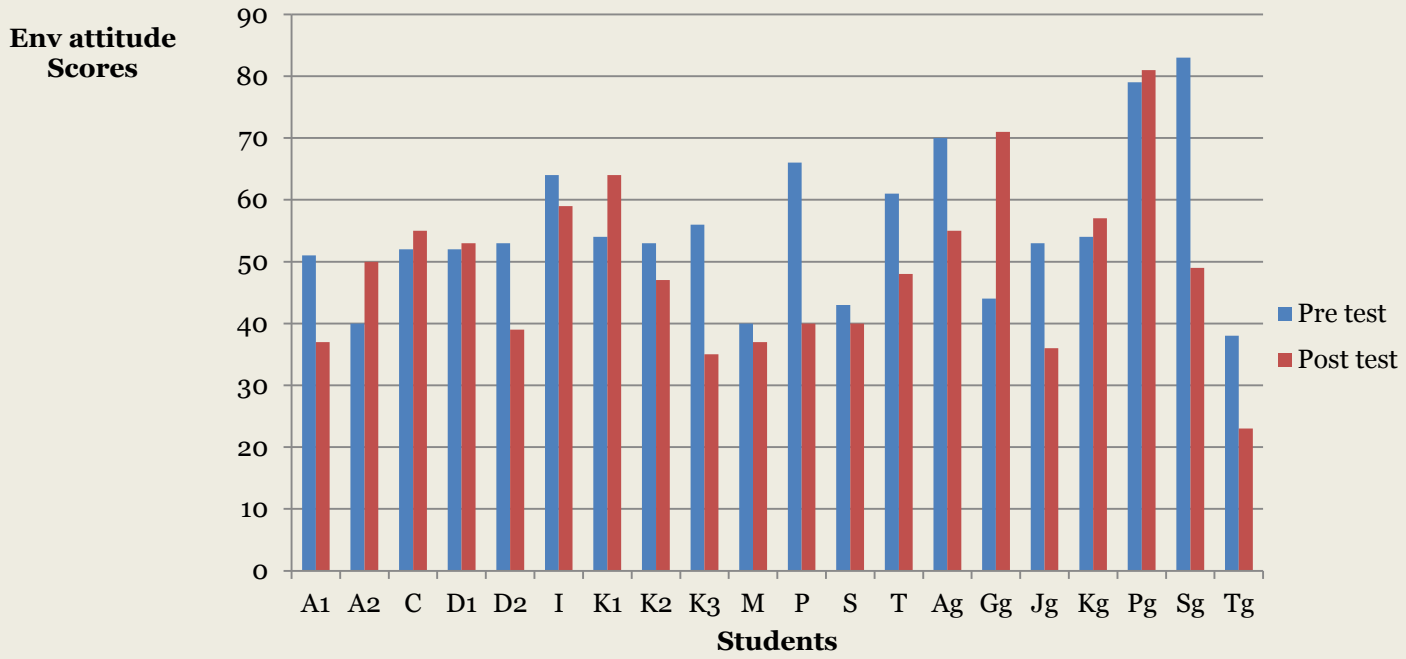

Figure 1: Figure 1. Comparison of pre and post test scores of environmental attitudes for Trinidadian attitudes of Trinidadian Grade 4 boys and girls. Girls n= 7; Boys n= 13. Total n= 20 .

Knowledge of local birds

Pre-test

- 10/13 boys, all girls: Eagle, Ostrich and Robin belong to Trinidad.
- No one identified the common Blue Gray Tanager or the Oil bird (a cave bird found at the nature centre) as belonging to Trinidad.

Post test:

- all the boys identified between 1 and 3 more local birds than in the post test.
- Everyone identified the blue gray tanager as belonging to Trinidad, and 8 students identified the Oil bird as local.
- No one identified Eagles or Ostriches as local birds, but 3 boys identified the robin as local.
- Four of the 7 girls showed an increase in numbers of local birds identified. four of the girls also continued to incorrectly identify foreign birds such as eagles, ostriches and robins as belonging to Trinidad.
- Six of the seven girls identified the Blue Grey Tanager and four the oil bird.

Habitat knowledge: trees, nests, forest, tall trees, and swamps, reflect their awareness of bird habitats in Trinidad.

Qualitative data

Interviews:

- Nothing hard
- Liked everything
- Loved most
- field trip
- Planting flowers
- Drawing maps
- The researcher

Journals

- Requested entries – letters to Dr kalloo, observations
- Spontaneous entries – letter to Dr Kalloo
- Details varied with literacy levels – from a few words to many sentences. All showed a desire to express what they learnt, and observed – birds in their homes and gardens as well as in the school.
- Drawing – artists showed their talents and passion.
- Observations: cooperative learning, creativity, passion, multiplier effect to teachers and schools, as they began to observe and use materials spontaneously.

Interpreting results

Positive change in environmental attitudes is associated with:

- Increased knowledge of their environment - birds
- Long term engagement in environmental work, (Dimopoulous et al (2008).
- Field trips, multi-sensory learning - pictures, games, outdoor observations, and problem solving exercises; sensitive and emotional content – story of Bernadette, visuals of animals harmed (Farmer, Knapp & Benton 2007)

Conservation – sensitive and emotional content

Lessons from lessons - sustainability

- The power of the affective
- Buy in – exceptional support of teachers and Principals.
- Positive discipline – noise, movement, praise, reward, problem solving, patience, nurturing.
- Multidisciplinary, developmentally appropriate approaches.
- Science as inquiry, participation, voice
- Deep vs shallow learning
- Links to the MOE syllabus
- Context, context, context – indigenous, relevant
- Low cost and easily accessible resources (but there are still costs!)

Unfinished business

need for refinement and further testing in the following areas

- The questionnaire
- Data collection and analysis
- Literacy development
- Community particpation
- Expanding and collaborating with class teachers
- Sponsorship
- The MOE – intersections with CAC project approaches

Why I do this work

Thank you

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