ENGAGING STUDENTS IN NEIGHBORHOOD LAKE IMPROVEMENTS

Mahadevapura Hobli, Bangalore
ACKNOWLEDGEMENT

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Dr. Harini Nagendra, ATREE Bangalore
USAID PEER
Head Mistress, Government Higher Primary School, Kaikondrahalli, Bangalore
Head Mistress, Government Higher Primary School, Devarabasannahalli, Bangalore
Head Master, Renuka High School, Devarabasannahalli, Bangalore
School Science Assistant, Renuka High School, Devarabasannahalli, Bangalore
Horticulture Teacher, Renuka High School, Devarabasannahalli, Bangalore
Watchmen, Gardeners, Kaikondrahalli Lake, Bangalore

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GLOSSARY OF TERMS

Gamification: The application of typical elements of game playing (e.g. point scoring, competition with others, rules of play) to other areas of activity, typically as an online marketing technique to encourage engagement with a product or service.

Dry Waste: Dry waste includes all items that are not considered wet or soiled items. This includes both recyclable and non-recyclable materials. Dry waste includes such items as bottles, cans, clothing, plastic, wood, glass, metals and paper.

Rejects: Dry waste that can’t be recycled or reused and have to be sent to landfills are called rejects.

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Government of Karnataka over the last six years has spent over INR 200 Crores towards the development of the water bodies of Bangalore, which once kept the city cool and verdant. However, the spending has not translated into an improvement in the condition of these lakes. The lakes have either turned into sewage bodies or have been encroached upon. The quality of water in most of the cities lakes is categorised as “E”, making it only fit for irrigation, industrial cooling and other non-potable uses. The storage capacities of these lakes have in-fact decreased over the period.

While this creates a need for stronger and more effective measures by the policy makers, it also requires the participation of general public, especially children who are spending increasingly less time outdoors. Their participation and engagement with these water bodies will ensure the continuity of the lakes by making it difficult for the municipal bodies to ignore the lakes.

In an attempt to ensure engagement of children with their neighbourhood lakes, Reap Benefit under the guidance of Dr. Harini Nagendra (ATREE, Bangalore) through a grant from USAID PEER has created an engagement module to increase their interactivity and engagement with the lakes and attempt at developing, amongst the children, a sense of ownership towards the lake.

While this creates a need for stronger and more effective measures by the
PARTICIPANTS
School 1 – GHPS, Kakondrahalli – Session Complete – 70
Students from class 7 (28 girls, 46 boys)
School 2 – Renuka School – Session Complete – 80
Students from class 8 (36 girls, 44 boys)
School 3 – ZHPS, Devarabisanahalli - Completed on Day 2 – 26 students from class 7 (10 boys, 16 girls)

DAY 01 ACTIVITIES
20th January, 2014

ICE BREAKER ACTIVITIES
Ice Breaker game to get familiar with the students and vice-versa.
Students were divided into groups through the icebreaker activity:
• Each team gave themselves a name.
• While majority of the students gave names based on the theme of the engagement as stated in the beginning of the session, names such as Parisara (Environment), Green team etc.
• Girls picked names such as Rose, Sunflower etc.
• Boys picked names after their favorite film stars such as ‘the Sudeep team’ and ‘the Darshan team’

INTRODUCTION TO ENGAGEMENT PROGRAM
Setting the objectives of the engagement, students were asked about their personal ideas

how they engage with the lake
• They usually play around the lake during their games period and also after the school (Kakondrahalli lake)
• They take strolls around the lake after school hours (Kakondrahalli lake)
• They have done bird watching at the lake (Renuka School at Kakondrahalli lake)
• They use the lake to wash their clothes (Devarabisanahalli lake)
• They also swim in the lake (Devarabisanahalli lake)

what they like about the lake
• They like to watch the birds at the lake (Kakondrahalli lake)
• They like the green cover around the lake (Kakondrahalli lake)
• They find the lake environment breezy (Both)
• It’s a good place to play (Both)
• They like the amphitheater near the lake (Kakondrahalli lake)
• They can swim in it (Devarabisanahalli lake)

what they don’t like about the lake
• People littering around the lake because that (Both)
• Waste water from the neighbouring commercial buildings being let into the lake (Devarabisanahalli Lake)
• There are no jogging tracks or walking paths around the lake (Devarabisanahalli Lake)

how they would like to improve the lake
• Students said they would like to increase the green cover near the lakes as that would make the place more shady and be more breezy
• They would like the surroundings to cleaner

INTRODUCTION TO GAMIFICATION
• Students were introduced to the idea of Gamification, that the engagement will be done through points based engagement
• Students from time to time will be given surprises and prizes for active engagement, participation and earning points

Story-telling game
• The groups competed against each other to write and recite the best story about the lake and its vicinity
• Students were asked to write stories based in the lake, either using the lake as the theme or as the protagonist. The exercise was created to let the children use their imagination to express how they relate with the lake
PARTICIPANTS

- School 1 – GHPS, Kaikondrahalli – Session Complete – 70 students from class 7
- School 2 – Renuka School – Session Complete – 80 students from class 8
- School 3 – ZHPS, Devarabisanahalli - Session Complete – 26 students from class 7

DAY 02 ACTIVITIES

27th January, 2014

OBJECTIVE OF SESSION

- To map the trees around the lake, identify the species and find information about them.
- The lake was divided into blocks, each block was allocated to one group of students to map

GAMIFICATION TECHNIQUE INVOLVED

- Each team of students were sub-divided into three teams:
  1. Tree identification team – they identified unique species of trees and plucked a leaf from it
  2. Tree counters – they counted the number of trees of each species
  3. Tree Documenters – they made a chart of the trees that were identified and counted by their group
- The groups were given 10 points for each leaf collected
- They were given 20 points for naming the trees
- They were given 30 points for finding further information about the tree

The students were fairly well aware of their surroundings and were able to identify many plants and also knew of their uses, to identify plants that they did not know, they went around and spoke to the gardeners, their teachers and passers-by. Because not all blocks had the same number of species, students who got blocks with fewer species of trees, worked harder to get more by finding more uses for the trees in their block.
DAY 03 ACTIVITIES
31st January, 2014

OBJECTIVE OF SESSION

- To map the remaining trees around the lake, identify the species and find information about them.
- The blocks that were not covered on day 1 were covered on day 2.
- Based on the experience from day 1, more time was spent finding the uses of plants and were more efficient in finding different trees in the blocks.

GAMIFICATION TECHNIQUE INVOLVED

- The groups were given 10 points for each leaf collected.
- They were given 20 points for naming the trees.
- They were given 30 points for finding further information about the tree.

PARTICIPANTS

School 1 – GHPS, Kaikondrahalli – Session Complete – 70 Students from class 7
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DAY 04 ACTIVITIES
3rd February, 2014

OBJECTIVE OF SESSION

- The main objective of the session is to help students identify types of wastes, value of different type of wastes and also identify the types of waste being dumped at the lakes near the respective schools.
- Each team of students were sub-divided into three teams:
  - Waste identification team – they identified unique types of waste being dumped around the lake.
  - Waste measuring team – they measure the number of each type of waste being dumped.
  - Waste documenting team – they made a chart of the type of waste that were identified and measured by their group.
- Students did the activity in the respective blocks that were allocated to them.
- The session started with a small exercise to help students broadly understand the two types of wastes, wet waste and dry waste. Further classification and the value of waste were identified by the students themselves as a part of the waste mapping exercise.

TYPES OF WASTE IDENTIFIED

Following is a representation of broadly the types of waste identified at the lakes:

Kaikondrahalli Lake
Types of wastes (Dry)

Devarabisanahalli Lake
Types of wastes (Dry)
DAY 05
ACTIVITIES
7th February, 2014

OBJECTIVE OF SESSION

• The main objective of the session is to help students identify types of wastes, value of different types of wastes and also identify the types of waste being dumped at the lakes near the respective schools.
• Students did the activity in the remaining blocks that were not covered in the previous session.
• On the second day of the waste mapping activity students were better at differentiating the types of wastes and understanding the value of each type of waste. For example, they were better at differentiating between plastic waste and rejects.

GAMIFICATION TECHNIQUE INVOLVED

• The groups were given 10 points for each type of waste collected.
• They were given 20 points for identifying the type of waste.
• They were given 30 points for finding each harmful effect of the waste and how the waste can be reused and recycled.

DAY 06
ACTIVITIES
11th February, 2014

OBJECTIVE OF SESSION

• While the previous two sessions were dedicated to understanding the types of wastes being dumped at the lake vicinity, this session was dedicated to cleaning the lake vicinity by clearing the plastic waste and rejects that was dumped at the lake.
• Students did the activity in their respective blocks.
• Since the clean-up was restricted to collection of dry waste, they were able to do clear the waste fairly quickly. Specifically, the Kaikondrahalli lake was well maintained, so the quantity of waste collected was relatively less than that of Devarabisanahalli lake.

GAMIFICATION TECHNIQUE INVOLVED

Team that collected the highest quantity of waste got points based on the quantity of waste collected, 100 points were given for every Kg waste collected.

Following are heat maps of areas where maximum waste was collected:

Kaikondrahalli Lake
• Renuka school boys collected 1.9Kgs of dry waste, girls collected 1.2 Kgs of dry waste.
• GHPS, Kaikondrahalli boys collected 2.5Kgs of waste and girls collected 1.2 Kgs of waste.
• At Kaikondrahalli lake, littering was visibly less as a result of good upkeep and accessibility to waste bins.

Devarabisanahalli Lake
• Boys collected over 3Kgs of dry waste, while girls collected 2.8Kgs of dry waste.
• Blocks G5 & H5 had maximum waste, this might be due to the fact that it is a small crossroad and is accessed the most.
• Plastic waste that was collected from the lakes were given at the nearest dry waste collection centre.

PARTICIPANTS

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DAY 07 ACTIVITIES
18th February, 2014

OBJECTIVE OF SESSION

In this session students reflected upon the activities done so far, and worked on completing the charts that they used to document their findings and their assignments.

PARTICIPANTS

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DAY 08 ACTIVITIES
25th March, 2014

OBJECTIVE OF SESSION

• Familiarize the students of Edify school with the Kaikondrahalli lake ecosystem
• Provide the students of Edify School and Renuka school the experience of working with each other in addressing an environmental problem
• Create a waste management system for Renuka school, the system includes human centred bins for collection of dry waste, mulching system to create compost out of dry leaves. (Wet waste is usually thrown into the lake for fishes to feed on)

PARTICIPANTS

School 2 – Renuka School – Session Complete – 80 Students from class 8
School 4 – Edify School, Nakamura, Bangalore - 20 students from class 6,7,8

GAMIFICATION TECHNIQUE INVOLVED

• Session started with an ice breaker exercise to familiarize the students of Renuka school and Edify school with each other and divide them into two teams with a mix of students from both schools. One for making bins, the other for creating a mulching set up
• The bins teams worked on making human centred bins that were made out of used transparent 20 Litres PET water cans which were placed at eye level to ensure easy accessibility
• The mulching team created two mulching systems, one was an elevated bed, the other was a mulching box
• The elevated bed was created by tying closely together large sticks found in the vicinity ad placed such that the bed is at an elevation of one inch from the ground, dry leaves collected from the surroundings were spread on the bed and layered with diluted dung
• The mulching box was a box created using the sticks found in the locality. Dry leaves were layered with diluted cow dung like it was done in the elevated bed.
• Students were trained on the maintenance of the bins
DAY 09
ACTIVITIES
18th February, 2014

OBJECTIVE OF SESSION

With Water Quality testing, we engaged the students in testing the lake water quality against their tap water and drinking water qualities. The students enjoyed the activity, as it gave them a chance to try chemistry out hands-on. They also got a chance to understand the impact of sewage and pollution on ground water.

water test findings

- The lake water was found to have bacteriological contamination
- It tested positive beyond permissible limits for various tests
- In all cases, ground water at the school also tested positive for bacteriological contamination and chemicals like Fluoride.

Kaikondrahalli Lake

The students from both Kaikondrahalli Government school and Renuka School tested water from the lake, their water filter and the Tap. The water from the lake tested positive for Fluoride, Nitrate and bacterial contamination. Similar trends were seen from their school’s water supply too.
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CONCLUSION OF SESSIONS

The schools ended the engagement by identifying various solutions to improve the quality of the lake, which they represented visually through charts.
With Sri Renuka High School, we took the engagement beyond its official conclusion. Students of Grade 9, DPS East where taken around the lake by a set of students who explained the biodiversity of the area to the visitors. Together, they worked on planting about 64 saplings across the school and built a composting pit together.

By the students: why they should conserve the lake, and 3 ideas how they’d do it.

A letter they wrote to Ms Harini Nagendra of ATREE, Bangalore thanking her and USAID PEER for their support through a grant.