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August 1, 7:30 PM-9:30 PM

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## “What I learnt from conversations with Dr. Vinod Raina”

Swati Sircar

PART 1

Dr. Vinod Raina of Eklavya Foundation in Madhya Pradesh, recently visited Asha-Seattle this May, when he generously spent his time discussing various topics with us in detail. Dr. Raina has had a distinguished career in education for the past 30 years in India. His experience in education throws light on the educational strategies currently being practiced in India.

Below, I have captured some of his anecdotes in broad categories.

### **A. Education: Language & Context - An HSTP (Hosangabad Science Teaching Program) experience**

Here are two specific instances from Dr. Raina's narrations that demonstrate how science education is dependent on language.

#### **Anecdote 1: Iron and Cotton**

The Hindi speaking children in Madhya Pradesh were asked:

*Teacher / Dr. Raina: "There is one kg of cotton & one kg of iron. Which one is heavier?"*

*Children: "Barabar hai." (They are both the same.)*

*Dr. Raina: "Are you sure? Cotton is so much (hand gesture showing huge volume) & iron is only this much (hand gesture showing small volume)."*

*Children: "Ha, barabar hai.." (They are still the same)*

*Dr. Raina: "How come?"*

*Children: "Loha bhari hai." (Iron is "heavy")*

*Dr. Raina: "But you just said they weigh the same?"*

As you can guess, this was a lesson on density. Dr. Raina (not a native Hindi speaker) was looking for the correct word for density in Hindi, so he tried the official word, *ghana*, meaning dense.

*Dr. Raina: "To tumhara matlab ki loha ghana hai?" (Do you mean that iron is dense?)*

*Children (very puzzled): "Nahi jungle ghana hota hai, bal ghana hota hai. Loha bhari hai"*

(Literal translation, which is NOT what the children meant, "The forest is dense, hair can be dense, but iron is heavy.")

To cut a long story short, Dr. Raina finally realized that in Hindi, the English word "dense" has two representations – 1) *ghana* (thick) – when the packing is visible (e.g. forest, hair) & 2) *bhari* – when the packing is invisible to the naked eye (e.g. metal = molecular packing). And that *bhari* stands for both weight & density in Hindi depending on the context.

These are issues they committees dealt with while designing the HSTP. Typically we don't think of language usage when

thinking of science education. This example demonstrates how they are very closely linked & why we need to be aware of the nuances of language even when teaching science.

#### **Anecdote 2: insects & their habitat**

In HSTP, the children used to catch different insects to study their habitat, food, and behavior. In an exam, the following was an experiment requirement:

*Two different insects were put in a bottle. The bottle was kept so that part of it was in the sun and the rest in shade. Slowly, one insect moved to the sunny part, whereas the other one chose the shady end. The children were asked why the insects behaved as they did. The correct answer was that they were from different specie. One preferred the light and heat, while the other one preferred darkness and cooler temperatures.*

One child wrote: "They didn't like each other". The HSTP team debated and decided to give credit to this answer. Later they realized that these children, who face numerous caste issues in their day-to-day lives, are very aware that people from different castes don't like each other. So "don't like each other" was the child's way of saying that the insects are from different "castes," or, scientifically speaking, "species".

#### **B. Math Education – Do we need Algorithms?**

Dr. Raina mentioned that the small time Indian shop vendors (both men & women) rely on and use common math skills as part of their business transactions. Most of the vendors are illiterate and do not use the standard math algorithms covered in a school's curriculum. Nevertheless, these business people rarely falter with the math skill they use. Dr. Raina cited algorithmic methods employed by various communities since the Vedic ages - methods that do not have formal recognition.

So who are we, as educationalists, to dictate that there is only one algorithm to do math? Who are we to decide which algorithm it is?

A few months ago, I attended a talk by Dr. Ruth Parker, CEO of Mathematics Education Collaborative (MEC), at the University of Washington's math department. Dr. Parker spoke about how one can free children from using just one standard algorithm, and instead encourage them to play with numbers in a more creative way that would in fact solidify their understanding of math. However, she was talking to a group of mathematicians; the moment she put across her views on how 'teaching algorithms is a complete waste of time', she lost most of her audience.

Like Dr. Parker, Dr. Raina has experience working with children from diverse backgrounds. It is very interesting to observe that two people coming from very different parts of the world share a similar vision of how the future of new age mathematical education should be defined

Later, Dr. Raina pointed us to the NCERT website that contains all the Indian syllabi in English, Hindi (& some Urdu). As a chapter we are going to look into these books. If you want to join the effort, email me at [swati@u.washington.edu](mailto:swati@u.washington.edu) & please check out <http://www.ncert.nic.in/textbooks/testing/Index.htm> where the books are in .pdf format, and categorized by class grade, subject, and book chapters.

### **C. BGVS with the literacy drive - what happened afterwards**

A few decades ago, Bharat Gyan Vigyan Society (BGVS) in New Delhi, did immense work in spreading literacy across India as a mass movement. It was very successful in empowering women in particular and catalyzed many rights based movements. One such glorious example is the Anti-Arack movement in Andhra

Pradesh. This successful anti-liquor movement was re-enacted by the protestors and captured in a must see documentary, *When Women Unite*.

This literacy campaign, by BGVS and other member organizations of the All India People Science Network, successfully mobilized thousands of volunteers at district levels all over India.

Dr. Raina informed us that the campaign developed district specific content and teaching-learning material to make education very contextual and culturally relevant to the people. In some cases, campaigners went down to block level education material when vast diversity existed within a given district.

Unfortunately, the campaign encountered severe criticism. Critics have been harsh that the initial momentum of the campaign fizzled within several years, leaving behind thousands of "neo-illiterates".

**While indeed, the momentum has been lost in many parts, Dr. Raina believes we can still learn a lot from the experience.**

...continues in the next newsletter

## **Honest Commitment**

There is a brilliant child hidden inside every student. Not every student can emancipate such brilliance. However, it is the responsibility of society to provide opportunities to every student. Education is the most primordial and primitive opportunity a society should offer to every single child.

I received part of my education from one of many Andhra Pradesh residential schools, where government not only provides free education but also offers free boarding. Even though I might complain about several things not being extraordinary in such schools, I strived to learn because of such opportunities. I was not alone. I was one of several fellow poor students. At least 85 to 90% of these students would not have received an education if such schools did not exist. The Indian government has been trying to improve literacy rates and provide education. However, because of several reasons, such as bureaucracy and corruption existing in society, not all the students born in India are provided with educational opportunities. The next three paragraphs enlighten the reader about some worrisome statistics, taken by District Information System for Education, in rural areas in India for the academic year 2005-2006.

The literacy ratio in India is 65.38% with female literacy ratio at 54.16% and male literacy ratio at 75.85%. There are more than 50 million students in India who are not being provided an education. Anywhere from 20 to 50 million students are still under child labor. Only 9% of students go to pre-primary schools before

### *Hareesh Veldandi, Asha volunteer*

getting into primary schools. Dropout rate for the students by class 6 is 50% while dropout rate by class 8 is about 68%. The primary reasons for these statistics are lack of schools in every part of India and lack of interest in children's parents in many rural areas to start or continue their children's education. On a positive note, a Public Report on Basic Education (PROBE) reports that parents are starting to realize the importance of education, but their attitude is still far from responsible.

Establishing schools is just half of the work; schools should ideally be maintaining the minimum number of required facilities. The dismal nature of the statistics in this area continues. Only 18% of the schools have pre-primary schooling facilities; only 2% of the schools are residential in nature; only half of the schools have boundary walls; about 16% of the schools have



no drinking water facilities at all while most other schools have no safe drinking water facilities; 50% of the schools have no proper toilet facilities while only 35% schools have toilets for girls; only 25% of the schools have electricity connections; 7% of



the schools do not have blackboards; 50% of the schools have no ground level blackboards; 50% of the schools have no play grounds; only 8% of the schools have a computer; and only 48% of the schools conduct medical checkups for the students. The reasons for these statistics are lack of sufficient funds and inability to manage the facilities.

Coming to classrooms and teachers, 33% of the students enroll in schools with classrooms consisting of more than 60 students;

63% of the schools have less than 4 classrooms while 10% of the schools have single class room; at least 7% of students enroll in schools with only a single teacher; 54% of school do not have regular head master; and 62% of the schools have less than 4 teachers while 33% of the schools don't have a female teacher at all.

The obvious reason for these statistics is government's little interest in providing quality education with fine teachers. Even though the government is running into some true administrative difficulties in improving the quality, it can do much better!

So, the government is not only failing to provide quality education but also, most importantly, failing to provide mere education to many. But why should we care about education? Well, we must care because education has the power to transform an individual and society. It provides the basic communication abilities, offers knowledge to sustain the betterment in a society, makes one realize the importance of fellow community members, paves diverse ways to improve economic conditions, and leads to more responsible individuals and society that can better understand the environment and the community.

In summary, some of the important concerns that need to be addressed in the Indian educational system are: lack of schools within manageable distance of homes; inadequate facilities in most of the schools in rural and semi urban India to ensure quality learning; lack of toilets, making learning opportunities difficult for girl children; societal and parental constraints for girl children who are being forced take over laborious works at home by quitting education; worst teacher to student ratio in several rural schools, sometimes one to several hundred; insufficient

communal participation in spreading the importance and requirement of education; and the lack of educational tools for extreme poverty and challenged students.

It is the responsibility of government to address these concerns. Though bills such as Right To Education (RTE) show steps in the right direction from the government, the society needs help from other organizations. Today, there are several NGOs and NPOs that address some of these concerns on a smaller scale. Asha for Education is not just one of them, but also ranked #1 among "Top Ten Slam-dunk charities". Asha Seattle is one of the biggest chapters of Asha and is currently funding about 50 projects in India. Asha has been funding hundreds of projects effecting thousands of children in India for the last sixteen years. For every child Asha supports, there are hundreds of other children who are left behind without support. Those children could be provided with educational opportunities with only more funding and more support from the donors.

You are the reason for our commitment to socioeconomic changes we have been providing and we need more support from you. We urge all the readers of the Asha Newsletter to make our society more responsible. Every penny that you donate will make a difference in a student's education. Every student whom you directly support will likely provide hundreds of opportunities to many others in the future. Help us in serving more children. Your contribution supports our honest commitment to providing quality education to as many children in India as we can reach.

Find out more details about Asha at [www.ashanet.org](http://www.ashanet.org). Please be sure to check out Asha Seattle chapter at <http://www.ashanet.org/seattle/>

# BRAIN TEASERS

1. Why do we need to know how to write numbers in words?
2. What is 00? Do we even need that? Why or why not?
3. Why is the metric system base 10? I.e. why 10 & not some other number?
4. If there are only 2 possible outcomes are the probabilities of those outcomes always 50/50?

**Bhoomiheen**  
Site Visit: Srijan  
March 2007



**Orukunte-mittur prauda shaale,  
Mulbagal Taluk, Karnataka**  
Site visit: Eera, October 2006



**Miles for Smiles 2007**  
team members:  
Amit, Amol, Megha,  
Neha, Palani, Pavan,  
and Subhasish.



**Sikshana Society,  
Bangalore, Karnataka**  
Site visit: Eera, October 2006

# photo gallery