



Azim Premji
University

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Azim Premji University

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Issue XXIV, March 2015



Inside:
Perspectives
From the Field
Some Large-scale Efforts

PRODUCTIVE WORK AS PEDAGOGY



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Learn*ing* CURVE

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PRODUCTIVE WORK AS PEDAGOGY

Editorial Team

Chandrika Muralidhar
Indumathi S
Madhumita Sudhakar
Prema Raghunath

Advisors

Ramgopal Vallath
S Giridhar

**Special Advisors to the
Issue:**

Sujit Sinha
and his
Work and Education team

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"Learning Curve is a publication on education from Azim Premji University.

It aims to reach out to teachers, teacher educators, school heads, education functionaries, parents and NGOs, on contextual and thematic issues that have an enduring relevance and value to help practitioners. It provides a platform for the expression of varied opinions, perspectives, encourages new and informed positions, thought-provoking points of view and stories of innovation. The approach is a balance between being an 'academic' and 'practitioner' oriented magazine."



FROM THE EDITOR



Knowledge and work are not separate from each other – creative thinking is encouraged by making and doing. From lessons of life, of equity, justice, creating a peaceful and sustainable society and world to personally experiencing what the textbooks say – work as

a means of meaningful education, one that culminates in learning for life from life experiences is now coming into focus once more. This process continues through life.

The starting point of this Issue is Mahatma Gandhi's Nai Talim which he envisaged over many years and made available in 1937. Over the years, it may have been forgotten, but in an India undergoing such vast changes in trying to make her educational system relevant to her society especially in the 21st century, it has regained its pertinence: indeed, Nai Talim has become basic to any discussion on education which culminates in creating the complete picture – of head, heart and hand. This aim may have different implications today from what Gandhiji's times, but is as vital. Children learn by making and doing and it is by relating these two to the larger context that the understanding of the whole picture is obtained.

It is this larger picture that this issue has tried its best to present. There is a spread of articles that have recreated, from across the country, the many schools that have taken upon themselves the responsibility of the principles of Nai Talim. The authors are all actively engaged in establishing the importance of work as a tool of true knowledge, unhampered by the burden of marks, ranks, textbooks and syllabi etc., though we cannot entirely get away from set routines and assessment methodologies. One article for example is by a writer who, having himself been educated in a gurukul run on Nai Talim lines, demonstrates how botany, geography and soil geology can all be taught and learned through cotton cultivation, as he did in his school. The article describes also how stress as a physical force is learnt, while spinning the cotton into cloth on a charkha illustrated both the principle of the pulley as well as the concept of friction.

Yet another article describes how Class 9 students took on the daunting task of creating methods of

saving electricity consumption in their school after serious and scientific audit. The learning they gained thereby was significant and, most importantly, lifelong.

There is also an account from a teacher who has spoken of her experience both as a student first and now as a teacher in a school run on the Nai Talim tenets. The school was a second home to her, as it now is to her students, with house parents taking as much interest in the students as the biological parents. Community lunches, treasure hunts to name just two, made for a safe, warm atmosphere in which children could explore their world within implicitly stated boundaries. In the same school, older children took the place of siblings who showed the way to younger ones.

One of the focus articles is a detailed exposition of Gandhiji's rationale in propounding Nai Talim. This article considers its relevance in the almost suicidal situation that the world in general and India in particular faces unless we halt the course we are on and replace it with a more sustainable approach.

This Issue, then, has attempted to take a long, hard look at the relevance that Nai Talim, first propounded in 1937, has in the India of today, nearly eight decades later. The explorations are on the idea of Nai Talim and the overall visions of a 'good society', rethinking Nai Talim in the light of the National Curriculum Framework (NCF) of 2005, as well as in the present context. This has been done against the background of experiments with present day ideas of education and work. Keeping all this in mind, the way forward is for us, as an emerging society, to draw lessons that help us to create knowledge with an emphasis on values that sustain and are in turn sustainable.

Your feedback is very important to the success of our magazine and we prize it greatly and look forward to receiving it.

Our deepest thanks for this special Issue go to Sujit Sinha and his Work and Education team. Without their backing, support and invaluable inputs, we would not have been able to bring it out.

Prema Raghunath

Editor, Learning Curve

prema.raghunath@azimpremjifoundation.org

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SECTION

A

Perspectives





Nai Talim Today: Some Issues and Possibilities

Sujit Sinha



School and Society

To understand Gandhi's educational ideas one has to explicitly keep Dewey's following quote in mind "We will know what type of education to provide, if we know what type of society we want".

Here is how one could state Gandhi's vision of ideal society: most people will live in small villages, work in agriculture or cottage industries, either family owned or owned and managed cooperatively. All kinds of work will have equal status. There will be high degree of village and regional economic self-sufficiency with low amount of goods being transported over large distances. Villages will be politically autonomous, able to take most decisions themselves through participatory, face-to-face, democracy. There will be large degree of equity and all kinds of domination-discrimination will be reduced. Everyone will be eco-literate, practice the 4Rs (reduce-reuse-recycle-regenerate) and live as per the Gandhian dictum of *'there is sufficiency in the world for man's need, but not for man's greed'* and it is only with such limits to wealth along with equity that envy and conflict will be reduced, leading to peace and truth, the two supreme Gandhian ideals.

Nai Talim or New Education, with hands-on productive work as the central pedagogic tool, was one of Gandhi's chief instruments to realize this above vision. And as per the vision stated above --- grappling with equity, justice, sustainability had to be one of the main concerns of its curriculum.

Would any progressive person in the 1940s to 1970s have believed in such 'backward' looking ideals? Most believed exactly the opposite and India as well as the world enthusiastically mounted the horse of Industrialism. Almost all progressive thought was on how to make this horse run faster and faster. The dominant discourse was whether Capitalism with a human face, or some variant of Socialism-

Communism, or some magical mixture of both, would do the trick.

In a simplified manner one can state the basic tendencies of Industrialism as: most people will live in cities and towns, work in large factories and offices, either owned by huge corporates or governments. There will inevitably be large differences in status of work and positions. Everything will be connected with everything: goods and services will be distributed and marketed over large distances through massive use of transportation. Most decisions will be taken by nation-states through representative democracy. Continuous upward economic mobility, ever increasing material wealth, greed and envy will be the main human motivating forces. Therefore, to dominate nature and extract as much as possible and as quickly as possible will be the main task of human knowledge and political-economic systems.

This was accomplished with the help of a standardised schooling system whose 'not so hidden curriculum' was to drill into everyone the aspiration of upward mobility and unlimited material wealth so as to accelerate the onward march of Industrialism. This schooling has pretty much spread all over the world and in one sense it has been quite successful. Even those whose school achievements are visibly quite low or incomplete and those who do not have proper access to this schooling have fully imbibed its above stated core aim. Readers should see how wonderfully Shri Narayan Desai says this in his introduction to Anil Sadgopal's Nai Talim lectures in Gujarat Vidyapith in Dec 2011.

www.youtube.com/watch?v=2_rgDaARGgk

"From the 1980s it is becoming clearer to more and more people that this horse of Industrialism on which we are mounted has gone out of control, endangering the very survival of (human) life. We

don't seem to be able to turn it any way, we cannot slow it down and we are unable to dismount. And we are fast approaching the edge of the cliff. From the 1980s onwards almost all countries have been getting together to figure what can be done, who should accept the 'blame' and bear the 'costs'. While there have been some decent moves to control the pace of this madly rushing horse, many believe that they are too few and maybe too late. But even now the majority are going about hoping that somehow they will not be affected by the crisis, or this crisis does not exist, or it is not as acute as many are saying, or with some magic it will disappear. Maybe the world, in order to be galvanized into action, needs a shock like the one Gandhi received in Pietermaritzburg railway station on 7 June 1893 when he was pushed out of the train."

Once India decided to embark on this journey of catching up with the 'successful' industrialised world and, in the basic essentials, do exactly the opposite of what Gandhi had envisioned, *Nai Talim* was as good as dead. There have been some analysis of how curriculum of *Nai Talim* was not designed properly; how very limited 'activities' were chosen, how difficult it was to do 'correlation' of subjects with work - activities, how school routine was too rigid, how difficult it was to train the 'teachers' (and very few were actually trained), how unhelpful were the government support systems, etc. All of the above are important. But my claim is that even if these things were done reasonably well (and they were done well in Gujarat and in some other parts of India), once we were hooked to Industrialism, *Nai Talim* would have inevitably collapsed, at the most lasting one decade longer than it actually did.

Worldwide and in India, more and more people are getting convinced that 20th century industrialism has run its course. More and more people are starting to earnestly look for political, economic, technological, cultural alternatives. It appears that many of Gandhi's ideas, including *Nai Talim*, are finding a new lease of life. These would obviously have to be re-interpreted as per today's and tomorrow's problems and requirements, just as Gandhi had done so brilliantly with many inherited ideas and concepts.

The following paragraphs will talk only about some

of the issues, a few possible features, and challenges of this renewed *Nai Talim* of the future.

Rural–Urban

Many recent writings talk about how the pace of urbanization in India will continue as before and even accelerate. And various studies show how rural youth and also their parents are not interested in continuing with agriculture and allied activities. Therefore in future (after 30-40 years) villages will just be a footnote in India just as it happened to the first-world nations as industrialisation rolled across the world. But such a scenario is probably too simplistic a straight line extrapolation of the past. On the other hand, if we think that the search for alternatives to 20th century Industrialism will pick up, then making villages desirable places to live and work might increasingly become mainstream agenda.

Although Gandhi did not have many good things to say about cities, it might be instructive to see how Tagore talked about harmonious city-village existence, which according to him had been disrupted by Industrialism's quest for unlimited material wealth. In his poetic language here is how he described a possibility:

"Streams, lakes and oceans are there on this earth. They exist not for the hoarding of water exclusively within their own areas. They send up the vapour which forms into clouds and helps towards a wider distribution of water. Cities have their functions of maintaining wealth and knowledge in concentrated forms of opulence, but this also, should not be for their own sake; they should be centers of irrigation; they should gather in order to distribute. They should not magnify themselves, but should enrich the whole commonwealth. They should be like lamp posts, and the light they support must transcend their own limits.

Such a relationship of mutual benefit between the city and the village can remain strong only so long as the spirit of cooperation and self-sacrifice is a living ideal in society. When some universal temptation overcomes this ideal, when some selfish passion gains ascendancy, then a gulf is formed and goes on widening between them" ("City and Village", The English writings of Tagore, Sahitya Academy)

Often when *Nai Talim* is discussed, it is assumed that this is something which may be applicable to rural areas, but has very little to do with cities. But today it is clear that cities are half the reality and will expand further for some years. Quite a few cities worldwide have embarked on innovative ways to move towards sustainability and are trying to reduce their carbon footprint in an equitable manner. Some like Curitiba in Brazil are even trying to 'irrigate' neighbouring villages as Tagore had dreamt of. Therefore today's *Nai Talim* has to be both for rural and urban areas and also strive to bring about this urban-rural balance and harmony.

No one wants to do agriculture and stay in villages

One of my colleagues and I had recently (August 2014) visited a north-western district of Madhya Pradesh where displaced forest people, tribals and non-tribals, have been given 2 hectares of land each, new villages have been established, and government schools opened in each village. A central small village in that area has an excellent school till Class XII run by an NGO. What was quite surprising that most of the land in August was not cultivated, although some was. Each 2 hectare land seemed to have one or two quite good looking trees; but only one or two. When my colleague spoke to Class X students about the future, they said that they would do Class XI-XII, then they would go to college, then nothing! They also said that they knew very well that at best there were "jobs" for only one out of 10 persons. Interestingly Madhya Pradesh has an "agriculture" stream in XI-XII and all students of this school opted for it as it was the easiest to pass. We found, as expected, that this had nothing to do with actual agriculture; the idea was to make students memorize the easiest probable questions so that they would somehow manage to pass XII. And imagine there were these 2 hectares of unutilized land!!!

As per government of India data, out of 140 million hectares of cropped land, only 55 million hectares are cropped more than once. That means 85 million hectares are cropped only once! Incidentally these are often the poorest distressed rural areas of India. Today there are enough models in almost all agro climatic and geographical areas of India showing that with "advanced scientific ecological" methods the total bio-production of such lands can be

increased 2-3 fold. Note that "bio" refers to not just human food crops but includes fuel, fiber, fodder, fertilizers, timber, animals, fish other minor tree produce. This is quite different from how industrial agriculture measures production. Even in the geographical area mentioned in the previous paragraph, the same NGO running the school has demonstrated that 2 hectares can make a family quite prosperous through proper water harvesting and integrated farming.

In this context, it is worthwhile looking at what happened in Cuba just 20-25 years back. In 1989 after the collapse of Soviet Union it actually fell off the cliff! It had the world's highest level of industrial agriculture, with more chemical use and mechanization per hectare than California, and then overnight all these inputs vanished. From an average food consumption of 2600 calories in 1989, it came down to starvation levels of 1600 calories in 1993 and USA gloated over its imminent demise. But by 1998 the food consumption was back to 2600 calories!! For our purpose it is important to note the kinds of "new knowledge" Cuba had to find, tinker with, re-learn, innovate with, and apply. This list would include old and new crop rotation, companion crops, intercropping, organic soil nutrients, biological fertilisers, all kinds of non-chemical plant protection measures, trying out new kind of ploughs and non-fuel mechanical devices. In 1997 there were 2344 trainings drawing 64,279 participants to learn how to use oxen for ploughing as there were only 50,000 oxen in 1990. By year 2000 there were 400,000 oxen! And there was reverse migration of educated youth from cities to villages!

To sum up, one of the challenges for the *Nai Talim* of the future in both rural and urban areas (urban agriculture is growing in some cities at a nice pace; by 2004, Havana city was producing four million tons of fruits and vegetables annually) is how to design the learning of core subjects through various age appropriate natural resource management work-activities. There is a vast range of experience worldwide from which one can learn. If done properly, the resulting understanding of ecological sciences will not be any less exciting and rewarding than the physical and biological sciences taught for the last one century in schools worldwide.

The other extremely important thing which *Nai Talim* has to deal with is the issue of equity and justice. The challenge is how to bring up these issues again and again in an age appropriate and sensitive manner. Especially when coming up with 'productive work' related to natural resource management, the question of equitable redistribution of land; and shifting away from individual assets to community assets, to the commons, is something which has to be integrated into *Nai Talim* lessons. Without this *Nai Talim* will be meaningless.

***Nai Talim*, decentralization and local self-government**

Gandhi had spoken about schools being financially self-sufficient through the sales of the goods produced by students. Predictably almost everyone protested pointing out the various pitfalls of this. But maybe in today's context, we can take that spirit and reinterpret it as - schools not only are a place in which children get educated and made ready for higher studies and training and eventually future economically productive life, but they should also contribute to their local society in various ways as part of their curriculum and in some sense give back to society as much as they receive.

In rural areas, often the schools till Class VIII or X or XIII have the largest physical infrastructure, large

number of teachers and most important, hundreds of youth spending a large part of their day and a very creative part of their lives in these schools. So why shouldn't the community and society get more out of this storehouse of resources?

Suppose a wave of decentralization, participatory democracy, and meaningful local governance intensifies. This would require local area planning, which would require baseline surveys, local resource surveys, local monitoring requiring periodic surveys and feedbacks, impact surveys, data analysis and usable presentation of such data etc. School students and teachers together can do this as an integral part of their curriculum.

There are at least two reasons why this is very important. Firstly, today in India we cannot envisage elected panchayat members in general having the above stated capabilities and, secondly, their numbers will never be sufficient to be able to do all the tasks required for this systematic local area planning and implementation. There is often talk of what the local government can do about quality education in their areas. We are completing the loop by asking what a school should be doing for quality local governance and development work. And this synergistic relationship between school and local government could be defined as excellent *Nai Talim* in today's context.

Productive work in *Nai Talim* today

Ideally, productive work in *Nai Talim* should satisfy as many of the following criteria as possible:



Here is a possible list of themes which could serve as *Nai Talim* concerns today. This is by no means an exhaustive one. Needless to say, the exact activities within these themes would be contextual, that is, local specific.

1. natural resource management & bio-diversity: sustainable agriculture, trees, animal husbandry, fishery, forest-based
2. agro processing : food, fiber, crafts
3. energy: bio, solar, chulha, wind, electricity use efficiency
4. water & sanitation: collection, storage, testing, purification, wastage, recycling
5. waste: segregation, recycling,
6. health & nutrition: hygiene, cooking, malnutrition , herbs
7. construction: mud, bamboo
8. bicycle & pedal power
9. local (socio-economic) survey: studies including monitoring of government schemes

How to take *Nai Talim* forward today

In recent years many states have shown an eagerness to restart vocational education from Class IX under the newly formed National Skills Qualifications Framework. But as NCF 2005 is at pains to point out again and again, *Nai Talim* is not vocational education: *Nai Talim* is using productive work as one of the main pedagogic tools to teach all the subjects right from Class I leading to harmonious development of the head, the hand and the heart.

Bihar is the only state whose government has recently taken a decision to revive around 390 *Nai Talim* schools.

The various articles in this issue show that, over the last two decades, some 'alternative' schools in various parts of India have tried to incorporate productive work in their schools or in their educational work. If we look at the themes mentioned above, there are many people and organizations all over India who are working on these themes and have developed excellent models working with adults, but, barring a few exceptions, have so far not ventured to try to teach them to school students. A possible strategy is to bring such 'development practitioners' and 'alternative school educationists' together. Moreover, many of these are also potential resource institutions if any state decides to experiment with *Nai Talim*. The Azim Premji Foundation has in its own small way started some experiments in its six schools.

As pointed out at the beginning of this article , the apprehension remains that if the community around a school is fully committed to following classical Industrialism the lure and momentum of which are still quite strong , what is the point in trying *Nai Talim* in that local school ? Will it survive? As Amit from Adharshila School in Badwani district of Madhya Pradesh says, "It is better to try out such *Nai Talim* experiments in communities and areas where there is already a people's movement searching and trying out alternatives to Industrialism".

Sujit is currently a faculty at Azim Premji University. He has worked in a rural development NGO (Swanirvar) in West Bengal for more than 20 years. This NGO was involved in education, health, sustainable agriculture, Self-Help Groups, and building model panchayats. Sujit's primary interest is re-interpreting Gandhi and Tagore's educational ideas to make them relevant for today and the future. He may be contacted at sujit.sinha@apu.edu.in



Some thoughts from Dr Krishna Kumar



Learning Curve has been fortunate enough to be able to reproduce some thoughts on education and the relevance of Gandhiji's Nai Talim. The excerpts here are reproduced with the kind permission of Digantar, Jaipur. This article was originally published in Hindi in Vimarsh, May 1998, titled 'Buniyadi Shiksha Ki Prasangikta'. This is the third in the series of lectures held at Digantar (this lecture was held on 10th January 1998). The excerpts below have been translated to English from the same.

There are many problems in speaking about Basic Education today. The biggest problem is this - that Gandhi's name is associated with it. There are a number of popular images that have spread about Gandhiji in today's society; those images are not examined again, and there is a kind of obstinacy in looking only at what is visible at an established level, singing the praises of Gandhi's greatness, treating him like a God or deifying him. On the other hand, it is connected to the matter of him losing his way, the feeling that that road got left behind long ago. This discussion has taken other forms, one of them being that modern India is this way because it has taken Nehru's path, and Gandhiji's path would have been totally different. Or that Gandhiji was wrong in choosing Nehru. The moment any discussion of an idea connected to Gandhiji starts, the questions arise again, that we have to make people understand the sanctity of the form the idea had initially been thought of in the circumstances of 50-60 years ago, and a long lecture starts right there. You cannot bear to listen to it, unless you are a Gandhivaadi, or you are interested in such discussions. In today's circumstances, this idea is not very easy.

I myself, as a child, studied in a school that employed the principles of Basic Education. I cannot look back on the years in which I received

this education with objectivity, because as you go farther and farther from childhood, you cannot view it scientifically. It gets bound in memories. So I am not saying that I am speaking from experience. But it is necessary for me to point out that not only have I seen such schools, but I am from such a school. And there have been hundreds and thousands of schools all over the country, and many among them still exist in some form or the other. Some exist in name only, but in some, we get to see Basic Education in some expanded form. If all of us show some interest in it, it will be possible to make a little effort to understand the overall form of such organizations. Then, it will help construct a better idea in your mind, than if I tell you anything. I have come here today to create a very small image, and to bring out and show you its inherent beauty, and I would like to start doing that now.

In the last 50-60 years, the proposal of Basic Education has been seeing its reflection in several ways in the philosophy of education, and in the methods used in the philosophy of education. It is not as if this matter has been actually specified in the proposal of Basic Education. But in the philosophy of education, and especially in articles written on this subject in the meantime, Basic Education has a presence somewhere or the other - not only in India but in other countries too. By the way there was nothing in the proposal of Basic Education that was something unique that Gandhiji plucked from nowhere. What he said was relevant to general life.

Three major things have been associated with the idea of Basic Education from the beginning. These three thoughts are now so familiar to us that the danger lies in us thinking that, "Arrey, we know all this, what is so novel about it?" And this can really be said that we have heard the echoes of the proposal of Basic Education in so many forms, that to separate it out, or to speak about its specialities separately, is unnecessary, and possibly even useless.....That's why I've given you these various warnings. In the world of philosophy, no idea is old, nor does it remain what it had been initially - both these things have to be kept in mind. Be it a 2500-year old idea, be it Buddha's or Aristotle's idea, be it an idea that has been introduced in our society just now - the idea never becomes old, even if not one, but a thousand generations have tried it, and even if they have opined that they tried it out and not found anything of substance in it! Even then, the idea has a glow. On the other hand, no idea remains what it had originally been when it was first proposed, because during that time, it would have lived in several other ideas. That experience of the ability of the idea to progress beyond its creation, continuously makes the idea reappoint itself in the panorama.

The three points are - One, working with hands should be taught at school. Two, education at school must be in association with the milieu. Very simple things. And the third - whatever is taught at school, whatever skills are encouraged, whatever aspects of knowledge are brought to the children - they should not be separate, but unified/holistic. They should be interconnected. These three things - work, the importance of local surroundings, and the effort to make the syllabus holistic have been put into practice somewhere or the other, in some context or the other, in different parts of the country, or at the state-level. Probably the only thing necessary to add here is that the third point in the original proposal of Basic Education by Gandhiji was raised in connection with handicraft. He didn't raise this concept of holistic form in the context of any ideology, nor in a psychological context, but in the context of handicraft/manual skills. Because his first point about working with hands in school wasn't that

you should also work with hands in school, but that the school should be centred on working with hands. It has to be so important that the other traditional treatments of school, involving different kinds of education and skill, all those have to be marginalized, become secondary, and the focus has to be on the handicrafts - not necessarily one handicraft, but definitely on one traditional handicraft. It will be good if that handicraft is such that it is available in the school's environment. That handicraft should be the central industry of the school and the different areas of the knowledge of the surroundings are interwoven into the syllabus and we can give this woven fabric the name of holistic education in the context of Basic Education. This interweaving is not a concept of universal psychology of the child's personality, nor is it a national ideology, but this interweaving has to come out of that skill which has been chosen as the central industry of the school. There were many other approaches, and the mention of all of them is not necessary. Especially the approach of productivity - if you run your eyes over history, other approaches were given importance but this central matter wasn't given importance. You will have heard in schools about "Work Experience" or some other things which have been put under "Socially Useful Productive Work," every word of which you can view with suspicion. All these things have come into being after employing the approach of Basic Education, and then included in its memory into the syllabus and is still going on. So it is not necessary to discuss all the approaches because all those are existing in some form or the other on the basis of the original proposal. Like this, the importance of the mother tongue was included. When you talk about local milieu, the mother-tongue logically comes into it, and needn't be mentioned. But yet, Gandhiji gave it importance and mentioned it again. In the original proposal, there was a definite importance to this, and it was in the context that if education was to be sowed in the surroundings, the mother tongue was the only natural option in front of us.

These three points which were a part of the original proposal of Basic Education, I have laid

before you only for the sake of registering it. Without throwing a historical kind of look again and again on a time gone by, we have to probe this proposal, in the spirit of simple analysis - or rather, not to probe it but to evaluate it, that how will Basic Education look today in the main contexts of education, if it is adorned, lit up and shown? If that tree is planted here in Digantar, what kind of leaves will grow from it? What kind of flowers will possibly grow? What are the measures to be taken to keep it safe, and blooming and fruiting? All these arguments can emerge from that.

From childhood itself we want the child to appreciate the greatness of certificates, so from class one itself they start receiving certificates. We want children to understand the significance of bells - the moment the bell rings; you have to stop doing one work and start another. The bell means that someone, someone stronger than us is telling us that you shouldn't do this work, no matter how much interest it is arousing in you. Now do that for which the bell has been rung. So bells start ringing, and as they ring, they leave us in a state where we consider the bell the symbol of being initiated into a bell-centric society. A real bell is one that doesn't give us any freedom. From the past 300 years, the bell of the industrial system has been a powerful means to tie us up. The modern school, in order to make children understand that bell, starts ringing the bell from age 3-4 itself, because of which, by the time they reach the age of 18-20 years, they are used to the bell.

After speaking in the context of children, I now want to talk about teachers. Among the main ideas inherent in Basic Education is the skill we can expect from children, the kind of responsibility they can take on, and what is suitable for them, and possible for them, and that it is not wrong to give them responsibility. Let them make anything with their hands which is related to a skill found in their milieu. Let them gain expertise in any skill they learn, and enjoy the feeling of being equipped with the resources they get from this expertise - that I can do this and that I did it myself. You have to view all these

qualities in the context of the teacher too. They should know what they can do and be aware of the richness of their resources, and they should be able to say that "I can do this". Even if in the basic proposal of Basic Education, work is mainly defined in terms of handicraft, there is no reason why we should not define work in a greater context. After all, Basic Education's ideas are basically related to life's work. Work that helps in living life. Life cannot be lived without doing all that work in the specified way, with expertise. Keeping children included in the work involving responsibility right from the beginning is the idea of Basic Education. Responsibility can be given in such work, right from the start. That is why we can define that work wholeheartedly. Whether it is the cleaning of a school, whether it is a toilet that has to be maintained, to arrange for water if there is a water tank or if there is no water in school - all these are small kinds of work, but today's education system is not making any kind of effort towards including these kinds of work in the curriculum.

The 6th survey of NCERT has been released recently. Looking at the 3rd, 4th and the 5th surveys, one can assess the progress made in the last ten years. No one, other than those working in NCERT, would feel proud of the progress made in respect of the availability of water, urinals and the blackboards. The moment anyone enters a primary school, these things are clearly noticeable. Even today we keep on saying that more than half of the schools cannot show a place where a child can make use of a urinal with dignity. In our constitution there is an article 395 which says that the guiding principle of the state will be to ensure that the children lead a life of respect and dignity. I keep wondering how one would feel going around a school after realising that he himself has no proper facility to use the urinals in the bus stand of Alwar. Problems about urinals and toilets have persisted for the last 50 years. If one starts pondering upon these issues one won't be surprised that Ms Madhuri Sahay, a great teacher, has given so much emphasis on the construction of toilets and maintenance of their cleanliness that she have even designated it as a separate skill by itself. You must also be surely aware of the importance of toilets in the

life of Gandhiji. The central theme of his political agenda was how to improve the lives of those castes which are invariably linked to the toilets. Will the present state of affairs continue, in which the entire toilet related work and the associated compulsions are part of the earlier caste system? Or should such work come in the domain of general work? It is as important to be as much independent in these activities as being able to earn one's livelihood after earning a degree. As far as the teacher is concerned, such initiatives become essential to run a school. In all these efforts, the role of initiative, independence and resourcefulness are inherent in the spirit of basic education.

A large-scale programme is in place to provide meals in schools. We have run it like a major responsibility providing special, trained staff for it for carrying out their job efficiently. From the point of view of basic education it is a challenge to prepare a teacher in a way that he feels empowered and can organize and provide all the material required for mid-day meal. He should not be compelled to procure these items only from certain vendors or certain companies. He should not be made fully dependent upon government grant or compulsions. He should be able to provide all the resources and materials identified by the modern scientific education in a tasteful and aesthetic way.

The environment of the old system of education, while it gave importance to being resource-rich, never tried to teach the aspects of beauty and aesthetics. This fact has been observed at a number of places. A sense of beauty, for instance, in organizing things in a way which reflects simple beauty. A tradition of bad and indifferent craftsmanship is deeply entrenched in the old system. The essence of a skill in the context of making a handicraft or writing a book is to create an object of beauty. If we want to broaden its domain, making it a part of this Basic Education, a teacher, entrusted with running a school, should be trained to instil in him a sense of aesthetics in the upkeep of a school using his own ideas.

Of what can the base of education be? Keeping it as our theme, we need to proceed to look at the

subject matter. We can find a way if we look at it from the point of view of psychology. I had dealt with it in brief and in a rather unjustified way. It will follow that the base has to be the personality of the child. Basic Education should mean an education which lays the groundwork of the personality of the child. It would invariably contain all the approaches and biases inherent in the perception of the child as per psychology. Childhood is a stage when the personality of the child takes shape and the child steps into adulthood. His preparation for it should have been completed. There is a conflict and duality between the child and life so also between child and the society. There is already a conflict between an individual and the society too. Keeping all of this in mind we have to create a base which helps the child to live in the society.

In the case of basic education, the matter is simple because the whole thing is about the collective experience of the children. If we need to know about the trees, information can be gathered by studying the trees in the vicinity in various seasons. Knowledge thus gathered can be considered as valid in the context of Basic Education. This then can be supplemented with other types of knowledge which could be considered as a special knowledge which is not having any direct connection to the society and the personality. It is only in the context of the creation of society that basic education is really basic. Not only in the context of personality but also for renewal of the society. There is denial of the colonial world in the life and thoughts of Gandhi. There was a big dissent in his thoughts. Basic Education cannot be called basic if dissent is not taught in it and this was a big lacuna which remained in the Basic Education policy which emerged during 20 to 30 years after the independence. There was absolutely no place for dissent in it. No scope was left for any issues where there could have been a possibility of conflict between the government and the society.

What should be the role of the government in respect to Basic Education? Ultimately, Basic Education is nothing but a loud declaration of the autonomy of the society. It is a challenge to the government to cordially and honourably

coordinate with the society. Basic Education has inherently a competing relation with the politics and the decisions taken by the political system. It makes sense to think that if basic education system cannot prepare the students to express dissent with the existing environment then the system itself is flawed. If the education trains us to live in the world of today, it follows that the world cannot be changed and we have to continue to live the way the world is. We have to acquire the means of livelihood and the qualities required for living. If servitude is needed, we

learn it. If competition is essential for living then we learn to compete. With this present system the world cannot be changed. If the basic education has to be in line with the Gandhian tradition, right of dissent has to be accepted in the spirit of religious fervour. I am not doomed to live life as it is but I can make it the way I want. During my lifetime I am capable of changing the world as much as the world has changed me.

Dr Krishna Kumar is professor of education at the University of Delhi. From 2004 to 2010, he served as the Director of NCERT. Under his leadership the National Curricular Framework (2005), one of the most significant documents pertaining to elementary education in India, was prepared. He was himself a student of a Nai Talim school in Tikamgarh, Madhya Pradesh and has written some of the most lucid and perceptive essays on Gandhi's education system as an integral part of Gandhi's vision of social transformation.



The Essence of Basic Education

Hriday Kant Dewan



Background

Education is considered to be preparation for life in a manner that the growing learner is assimilated in the society but also has the potential, desire and capability to transform it. Our education today is not able to prevent children from moving away from their roots. They are aspiring for professions that do not require physical effort, entrepreneurial risk, a social responsibility and the need for working with peers in collaboration. They are increasingly alone, alienated, and think and undertake experiences, attitude and feelings mechanically. We all feel the force of overemphasis on cognitive aspects and mechanical rationality. Rationality is valuable but not in absolute and by itself. It has to be tempered by ethics and sensitivity. The program of the school also does not include building up a sense of responsibility in the child; responsibility about the school, about friends and about ones own life. People choose to overlean towards materialistic consumerism and leisure rather than enjoying work and ordinary choice of living. It is argued that basic education has a statement to make on all of these and is a way of addressing some of these issues.

Why education and why the point of basic education

We must in considering this remember that it is not correct to take an educational idea out of its political, social and historical context. It is not enough to say that education is influenced by all these but rather it is driven by these. The purposes, the support and everything else emerges from the understanding the proponents have of these. They are the ideological underpinnings or the bed rock on which the conceptualisation and implementation of education occurs. There is a lot written about the relevance of basic education as well as debates on its actual purpose. It is an idea that has been interpreted in many ways and in many contexts. It has also been examined in terms of whether it is a set of new principles or a combination of old known ones. In this discussion leading to the basic education formulation, the historical contexts of

Indian society and responding to the changes and development outside as well as inside is important to examine. For example, it can be argued that rather than any generous purpose of democratising, the expansion of economic interests necessitated the expansion of educational processes to many more. It can be not denied however, that the expansion of education also implied the acceptance that it is not only a certain set of people who could learn, read and write and be knowledgeable. As the acceptance of a larger set of people to be educated grew so did the discussion on who would educate them, what would the education comprise of, what would be the structure where education would be imparted, what would be the method by which it would be imparted etc. These questions of purpose and objectives, of its governance, control and decision making, its financing and the sources and nature of it, the idea of the teacher and her relationship to the children and the community all formed a part of the points of deliberation and contest. They took the scope of the discourse outside the domain of those trying to restrict it to functional economic purposes.

This struggle around the purpose and implication to spread education continues and also affects the way basic education is looked at. The questions are a part of the discourse that is trying to describe the education system for the country and perhaps even wider. In the Indian context, around and prior to independence the manner in which the government defined education and its purpose and the mechanism it wanted to set up in order to make its reach wider, did not have the same tone as those who were a part of the struggle would have liked. The fact that the system today after over 65 years of independence largely reflects the same principles and the same attitudes poses awkward questions for us.

Principles of Basic education and the contemporary context

When we look at some of the points of debate we can recognise that the essence of basic education

principle challenge the education system of today. These need to be probed deeper and re-articulated in today's context. This challenge and its implications may translate to fundamentally different specifics from what were articulated at that time. The confusion about the purpose, implication and relevance also arises from the way basic education was implemented and allowed an interpretation that reduced its potent form. The diluted discourse around basic education does miss out on some of the key socio-political as well as economic implications and does not focus the difference in the very purpose of education. The many convenient interpretations of basic educational discourse may as much be a product of deliberate acts of co-option or misunderstanding as they perhaps may be due to inability to shift the context of the articulation to today. It must be acknowledged that this article is also one more interpretation of the idea. The opponents and proponents both may find that this has missed some points that would in their view critically alter the importance, relevance and intention of basic education and this analysis.

A detailed exposition of this concern would require a lot more discussion and the idea here is to present the basic picture of this analysis. We would therefore look at only some of these aspects and share some directions that would be useful to think about. The logical framework would only be hinted at. As an example, one of the points to think about is the inherent principle, self-governance and self-rule for the community. The need for the ideas and vision of the community to build a path itself and hence direct the education of its young is not the same as an Indian Central or a State Government doing that. We need to examine the purpose of education as an enterprise to enable the young to be helpful to the community and be assimilated in it and accommodate to it and simultaneously also make it accommodate to the new ideas learnt. This implies at the core the making of community transformation agents while being immersed in it. Again the notion of community being extended to the idea of (national identity) nation and then to the globe (global citizens) has a very different elaboration from the centrality of closer community and direct human relationships. The lament of some of the proponents of basic education, that modern education is merely literacy and numeracy and hence destructive to the sense of empathy and encouraging exploitation is poignant. We have seen modern education do that. It has alienated people from their communities, disrupted

them without any significant increase in empathy and capability to transform the lives of the people in the community. It has purged communities to make larger sets. We are not arguing whether that is good or bad but just pointing out the change. It can also be argued however, that modern education was not intended to do that or even it is also opposed to it. It is only the way economy and hence society has changed that has led to this.

The control of and providing direction to education

In order to put in perspective the contemporary context of principles emerging from basic education and construct the discourse around it, let us look at some of the key points of the education system today. The education system today is funded and governed by the government. Even though there are many private schools now and their numbers are growing but they are still far less than the number of government schools. And the number of community managed schools are continuously decreasing, squeezed as they are from both sides - government take-over and private schools that are managed by one or a few individuals. There is also a lot of mobilisation around the need to improve the public education system. There is talk around the need to have common schools at least till the students are in the age group where they must all be in school getting education. It is now seriously being considered that compulsory universal education under a justiciable commitment should be available up to class X to all learners. The RtE has already made it mandatory that all children must be in school and stay there at least for 8 years. So the act of right to free and compulsory education requires that each child stay in school and be educated through mechanism that are aligned to the purposes and the manner decided by the State educational bureaucracy in some way. Even in the discussions around purposes the over-hanging shadow of who controls and funds educational processes is clearly visible.

The curriculum and the text books are all produced by the bodies aligned to the government, be it the State or the Central government. This is thought to be according to the spirit, the understanding and the details of the National Curricular documents. The division of the years of education, the areas of emphasis and focus and other such details are also governed by the government. The recent case in point of Delhi University and some private universities having to withdraw their four year under-graduate programs because they were not according to the national education policy that

recommended the 10+2+3 pattern. The over-riding power of the policy to dictate what the universities and Boards of Education can construct as programs and the constant effort of all State governments and Boards of education to claim that their program is according to the National curriculum Framework document is also illustrative of the same. The desire and need to toe the line and interpretation of the government functionaries is not merely because some of these are funded by the government. It is also to use the apparent legitimacy it provides.

The major investment and expenditure on education is however, still made by the government. This money does come from the people but in the form of taxes, CESS and other surcharges. There is no particular product or activity from whose taxation goes to education. Where the money would be spent and in what manner is also decided by the government. The compensation and salary to be paid to the teachers is also something that is not linked to the community and it has no say in the matter. The nature of the teacher, the materials and methods she would use and how the children would be assessed are all decided by the educational structures of the government.

Community participation and its implementability

There have been various attempts to include the community in the process of schooling including in the appointment and management of the teachers and currently the idea of the school management committee with the parents as members appears to come from the spirit of the inclusion. The results of this attempt have been disappointing. The important issue that worries is of the limited participation of community in deciding and contributing to the educational process. The present role of the community at best has only been of subsidiary labour. It has been to help provide for or construct school buildings, ensure or monitor teacher attendance and act as a shepherd for children to the school. There is no other role and contribution. The aspirations from the school education are towards service sector, white collared jobs and government jobs. There is very little scope in school for preparation to be a part of the existing economy around them. While we must try and ensure that everyone has access to any job opportunity, school education, by ignoring the local community, continuously denigrate a large part of the neighbourhood economic enterprise. Also the non-comprehension of the aspirational goals makes the community incapable of an effective dialogue with the school or with their own children. The

recent documents have attempted to raise this concern and have pointed out the need for a larger role. That however, is not even visible on the horizon. Clearly the absence of the enabling factors and the resultant lack of conviction of all sides make both the scope and the actualisation of even the stated roles difficult.

Key curricular principles emerging

In the light of the above let us reexamine the key curricular principles we extract from the idea of basic education. As we do that, we must remember that the current system attempts to caricature the idea of basic education. These principles are not seen in the form they are stated here but are the back bone of the movement that engaged so many people and got them to initiate a varied set of processes for fulfilling the educational and other related goals. The manner in which these ideas emerged was not uniform and they did not reflect specific commonalities either. However, there was a basic spirit that informed these. That spirit arose from the urge for reconstruction and resistance to what was perceived as imposition. It may not be that it was articulated and reflected fully but it was at the base of the idea of basic education. Let us look at some of the principles:

- a. A process that is based on inclusion of the community, its ideas, concerns and experiences. The manner in which this would be interpreted and the extent to which the ideas of the community would be included or attempted to be replaced is a moot point. Given the role of education as both a preserver of culture, tradition and heritage as well as harbinger of new ideas and progress it is difficult to have one view on this. Many Indian educationists of that period therefore ended up with different viewpoints on this. The debate on who is more educated, the illiterate or the one who has 'merely' read books, has not fully subsided.
- b. A process that is set up in the context of the child and is based on and uses her experience. This is another point that has been brought in to focus by the idea of 'constructivism or constructionism' (For the limited purpose of the point that is being made we would not try to analyse their common and different points). This on one hand brings to focus the scope of the knowledge that we are engaging with but also the question what is knowledge and which knowledge is valid. While the consideration of education as a process of knowing is well

accepted, the centrality of child and community knowledge forces the question what should be engaged with in the formal school system.

In a learning process focused analysis this can be reduced as a caricature to the issue of education as a delivery of knowledge vs. education as a process of creation of knowledge. While this is being a bit harsh, yet often the programs of education do forget the frameworks of knowledge validation and emphasise the need for the children to formulate their own answers. This is often also linked to basic education and respect for local knowledge systems.

- c. Use of the language of the child to educate her and a greater use of her language experience. The context of this particular principle has at its base two critical elements. One arises from the specific socio-political context at that time and even now in some ways and the second is from the feeling about human learning mechanisms. The creation of a respect for self and building a sense of identity and positive attitude to the culture, traditions and modes of thinking of the community that the child comes from, requires the use of local language. It also enables her to bring her own concepts and compare them with the formal abstract concepts of the books. The use of local language is also important as it implies its growth and development and expansion to include newer concepts. It is also a means for mobilisation and sharing among the whole community rather than restricting many who do not have access to the new school language and hence can not absorb new knowledge from those who learn it through exposure and through reading. So use of mother tongue is not merely an innocent pedagogic purpose that it would help the child build her conceptual structures but rather is a deeper statement of giving the language of the children and the community a weight and respect and to bring new ideas and knowledge in to it. Empowering the community to structure its own destiny.
- d. Reaching all children and all members of the community, respecting their work and including elements of that in the school. Ensuring the participation of the community in defining what children should learn, in helping children learn and being responsible for assessing them. The local community can give the children understanding and knowledge about different

artisans' roles. The programs must relate to the needs and experience of the community and be sensitive to their choices as well. This may be contrasted with the effort to evolve a national policy of education and a curricular framework that would be binding for all schools and all teachers. The multiple school level choices and reconstructions of the principles of basic education require a diversity that is not a part of the visualisation of education. And that takes away the spirit of personal engagement, ownership, initiative and creativity not just of the community but most critically of the teachers.

- e. Using integrated experiences that develop ethics and concerns (Heart), concepts, procedures and logical ability (Head) and the ability, stamina and creativity to produce things (Hand). In order to have opportunities for children to engage in some trade, school must be located in a setting where children can participate in such activities. It is, therefore, important for the school to be placed where the community can interact with it. These aspects are more important than mechanical considerations like size of rooms, size of playground, etc.
- f. Development of self-confidence, social commitment in children, discovering and taking responsibility for their role in community and functioning of the school.

From the above principles it would also be important to have local community teachers who can be specially prepared for teaching in the elementary schools, particularly in the primary classes. Much more important than a teaching degree would be local knowledge, competence, empathy and understanding of the culture, traditions and language of the children.

The principles in the current context

It is clearly not easy to visualise these in the current context of education. There is no way the community can be the driver, the provider and the owner of school education in the current scenario. In the last three decades or more, different kind of mechanisms to involve community have been made and at present the RtE has mandated a School Management Committee (SMC) that has parents of the children studying the school as key members. There have been attempts to involve the community in monitoring teacher attendance, in contributing to the school building and over seeing

and managing its construction and some other ideas including that of making a plan for the development of the school along with the teachers. There have been micro and some slightly larger spread efforts to include the culture, language and knowledge of the community as also make noises about use of the mother tongue and multilingualism. The NCF 2005 has emphasised all this along with development of complete personality including experience of work on trade, respect for manual labour etc. Yet these have been all half hearted attempts keeping the large centralised bureaucratic framework intact. In fact with more rhetoric of decentralisation the control and directions have increased and moved further away from the school. The system functions to provide fake or otherwise evidence of the aspects considered important by the centralised authorities rather than be actually sensitive to the community and the children. The education process, because of non-inclusion of the community and because of the centrally determined programs, is becoming extremely alienating. While it may not be necessarily possible or proper to have a school system where schools are governed by the village community, any attempt to handover governance of the school to the elected representatives has been half-hearted and consequently not worked. This is fundamentally opposed to the ideas that basic education includes. For example, the possibilities of involving the community along with its economics, culture and functioning as integral to governance.

The system of education is governed by a need to be universal and homogenous. It attempts to create an illusion of equity by not recognising diversity. The challenges of largeness, homogeneity and skewed aspirations lead to many distortions including filtering of students and the on ground eschewing of real inclusion and a fair deal to those from deprived and marginalised background and those who are at a learning disadvantage. We are fighting the inclination to believe and assume that those from deprived backgrounds are fundamentally unsuited to learning. Any extra effort made for them is going to be waste. The sense is to put the onus on learning on children and community with the argument that if there is no demand no one would get educated, whatever be the quality of the program. And like 100-150 years ago today we have demand for English and English medium education. It would be unfair and unwise to dismiss this as a mythical demand created by perverted minds. In the midst of continuous centralised placements, centralised assessments and competitive performance; the spirit of basic education cannot become a part of the school program.

Misconceptions around basic education

The foundational principles and purposes of basic education cannot be aligned with comparing children learning, comparing it across regions and making the focus of elementary and secondary education the gate way to better further education and better opportunity. The purpose of education as per basic education cannot be that of a filter. The viewing of school education as an effective sorting machine has led to many misconceptions about basic education. These confuse the principles and the fundamental objectives that work and education and inclusion of community stand for. For example, it may be taken to mean any of all of the following:

- a. It is for rural children and for poor children. These children need education of this kind as they must learn to work with their hands.
- b. Use of the child's mother tongue means only using the language that is spoken by the immediate family of the child, particularly the primary care-giver.
- c. It must include learning the spinning wheel and similar professions in the curriculum, and must restrict the imbibing of new ideas and new directions. The trades or professions chosen for the school have to be rooted in the ideas prevalent when the idea of Basic Education in India was being developed over 70 years ago.
- d. The school should be supported by the income from the produce of the school itself.
- e. Everything done in the school should be co-related with each other and concepts taught through working with different trades.
- f. Basic Education means preparing children for vocations and is a prelude to vocational education
- g. Basic education is only upto elementary level and its principles cannot be useful for secondary and senior secondary education. It has no implications for higher education.

None of these are correct and some of them are actually contrary to the very spirit of basic education. Some of the others can be said to be just about the form and not the essence of basic education. The reasons for these to emerge as the primary notions for many persons lies in the fact that the ideas of basic education emerged during

the struggle for independence as a means to build and aid resistance and have embedded in them the elements including economic and others that were symbols of some form of resistance. The curriculum and ideals of basic education evolved around the idea of nationalism and national identity of a certain kind. They are imbued with that apart from other things. It is an educational process that has the 'community' in participative control of education in a large way and the government itself needs to have a minimal role. All these had to be substantially diluted as the expanded school system needed to be set up even at places where the community was not ready for it. Given the principles and the reality it is not surprising that in implementation the idea of basic education got considerably distorted.

Hierarchy, distance and centralization

The inherent nature of the centralized system where the trust and agency of the school and the teacher has to be subservient to the observations and views of the inspector who would also conduct an external exam, is not aligned to the spirit of education that has a large element of local visualisation and governance. Systems of education like that emerging in the pre-independence scenario emphasised for schools self directed motivation and purposes. Their energy and enterprise came from the perusal of personal and collective visions with a responsibility and opportunity to exercise choices. The challenges on the way had to be met and were not obstacles but

occurrences as they arose out of self directed challenges. There was a sense of creativity, excitement of new learning and sharing. They felt they were doing something purposeful and important and could see the results of their efforts as well. It is not that they could be using excellent methods and the best strategies but it was the best for them and their students because they believed them and more than that owned them as they felt they had themselves created it.

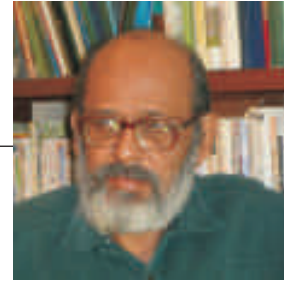
Increasing formalisation, intellectualisation, expertism, arrogance and disrespect due to centralised authority has led to reification of many of these ideas and principles. The increasing knowledge about education, about learning, about society has left those who are responsible for actually transacting education and those who are the major stakeholders far behind. The large centralized structure has not been able to respect either of these groups and make them feel conscious of their role, responsibility and authority in exercising it. The basis tenet of the educational principles of basic education would require fundamentally restructuring the system. It is a moot point whether we want local control or worry that local control would lead to distortions and would be against the program of modernisation. In that case and in case we believe in the State control of education, idea of basic education may not be best way forward.

Hriday Kant Dewan is currently a Professor with Azim Premji University. He has been member of the Founding Group of Eklavya and Educational Advisor of Vidya Bhawan Society, Udaipur. He has been working in the field of education for the last 40 years in different ways and aspects. In particular he has been associated with efforts on educational innovation and modification of State educational structures. He may be contacted at hardy.dewan@gmail.com



Learning Outdoors through Action and Reflection

Ardhendu Sekhar Chatterjee



Local environment & Livelihoods/Life ^{Bygo!}
Based education.
(also known as PCBE, ie Place/Location based Education that engages learners with Local natural and Cultural environment. PCBE is based on / reflective of and oriented/to relevant to local way of life and means of generating livelihoods.)

PCBE focuses primarily on land & water resources, biodiversity¹, ecosystems² within a micro-hatched / bio-region on one hand; and Cultural history: or tools and techniques used by local communities/groups to manage these bio-physical resources, on the other as the content of teaching & learning. PCBE is a holistic and multi-disciplinary process and pays attention to various management structures and social arrangements to facilitate the exchange / sharing of knowledge, skills, technology, resources etc.

PCBE is an amalgamation / combination of principles developed under various approaches. Prominent among these are: 'Environment Education', 'Eco literacy', Community Based Education, Socially Useful Productive Work based Education, Problem Solving and Lateral Thinking based education and Participatory Learning Action / Planning, Education for Sustainable Development³ etc.
Factors that distinguish it is in being locality based, activity / project based - where learners decide the width & depth of questions to be explored & therefore open ended / exploratory.

Box 1: Bio-Diversity

Biodiversity is the diversity of species + sub sp / a variety, family/genus and ecosystems/niches they occupy roles they perform.

These are looked at with reference to a particular region often defined by soil + terrain as well as climate (particularly the range and distribution of rainfall and temperature, which in turn is often dependent on altitude as well as latitude of a location)

Box 2: Ecosystem

Ecosystem is any location, within a defined boundary. We study the population of all living organisms and group them as 'Producers', 'Consumers' or 'decomposers' and look at their relationship to each other as well as to the non living component of their habitat / space of living. Life cycles, Cycling of matter and transformation from one form to other as well as flow of energy in and out of the system are given particular attention. Rice Farm / Wetlands, Home or School gardens / Irrigated drylands, Slash & burn agriculture / upland farms are some examples of man-made or agro-ecosystems. Forests, rivers + streams, grasslands / scrublands are some examples of natural ecosystems.



Learning hands-on to plant a tree

PCBE is mainly different because of its assumption Page 2
tion of how people learn? Fig A 16 gives a brief outline
of the 4 steps and 4 sets of activities/processes involved.

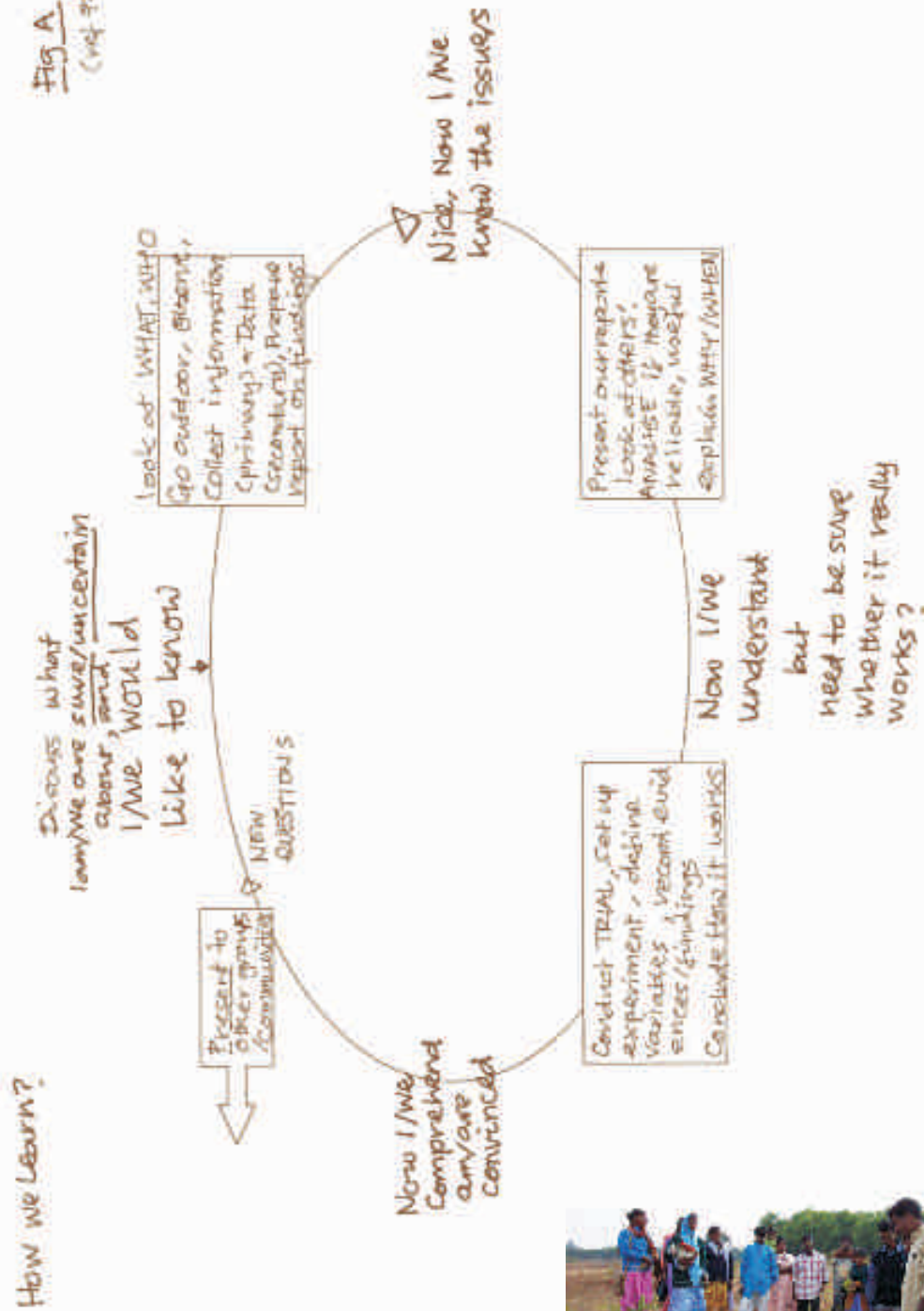
Details of this Enquiry based learning approach:

Step 1 Starting point is a discussion among learners
listing what they already know about a broad or narrow
topic or sub topics [Soil Fertility for instance is a broad
topic, Compost or green manure are narrow topics, whereas
making vermicompost or Vermiwash a sub-topic]
Quite often a visit outdoors to a forest, sacred grove,
pond, lake or river, a farm or food processing unit may
need to be organised to generate questions and define
potential sources of information. What they would like
to know/find out (WHAT, WHERE, FROM WHOM?) is listed.

Step 2 Learners often form small sub groups and venture
outdoor to collect information. Own observations are
recorded and semi structured interviews are organised to
speak to affected people/stakeholders and local experts/resource
persons. Secondary data is found from newspapers, books, maps etc

Step 3 The findings are presented and discussed. Tabu-
lation is done, averages & deviations are worked out, trends
and patterns/cycles etc are identified, similarities and
differences are listed, often map overlays used to explore
connections. Cause & Effect diagrams, Paired or Priority
rankings are done to find out preferred solutions, resource
use conflicts are identified. All this analysis & synthesis
leads to hypothesis (theory of what is likely to happen F?)
Teacher/Facilitator encourage by asking open ended questions

Fig A
(not 92)



Children on an outdoor trip

Step 4 : experiment / field trial is set up ^{Page 3} to collect reliable evidence to prove or disprove an assumption. (eg. subsoil irrigation reduces the irrigation water requirement or vermi-compost is a much better supplier of plant nutrient than farm yard manure or pre-sowing treatment of rice seeds in a 15% solution of Cow urine leads to much better germination ratio!)

Step 5 : Presenting findings of experiment to other Students, to farmers and other members of community by using communication media such as street theatre, Songs, Chants & posters, demonstrations in a public space etc.

A long term action plan to improve management practices, resolve conflicts of interest, seek help of competent & local authorities, may result from these discussions

Place & Community Based Education as a pedagogic / learning process thus is based on connecting the students / learners to nature & culture. They work individually and in groups to explore & document real-life issues / conflicts, particularly related to local climate / weather pattern and ecosystem + biodiversity and develop creative & sustainable solutions ^{mainly} through participatory analysis, experiments and action research projects, the results of which are examined / evaluated against pre-determined indicators.

In Fig B, a mind map exploring interconnection with different subjects / themes is illustrated

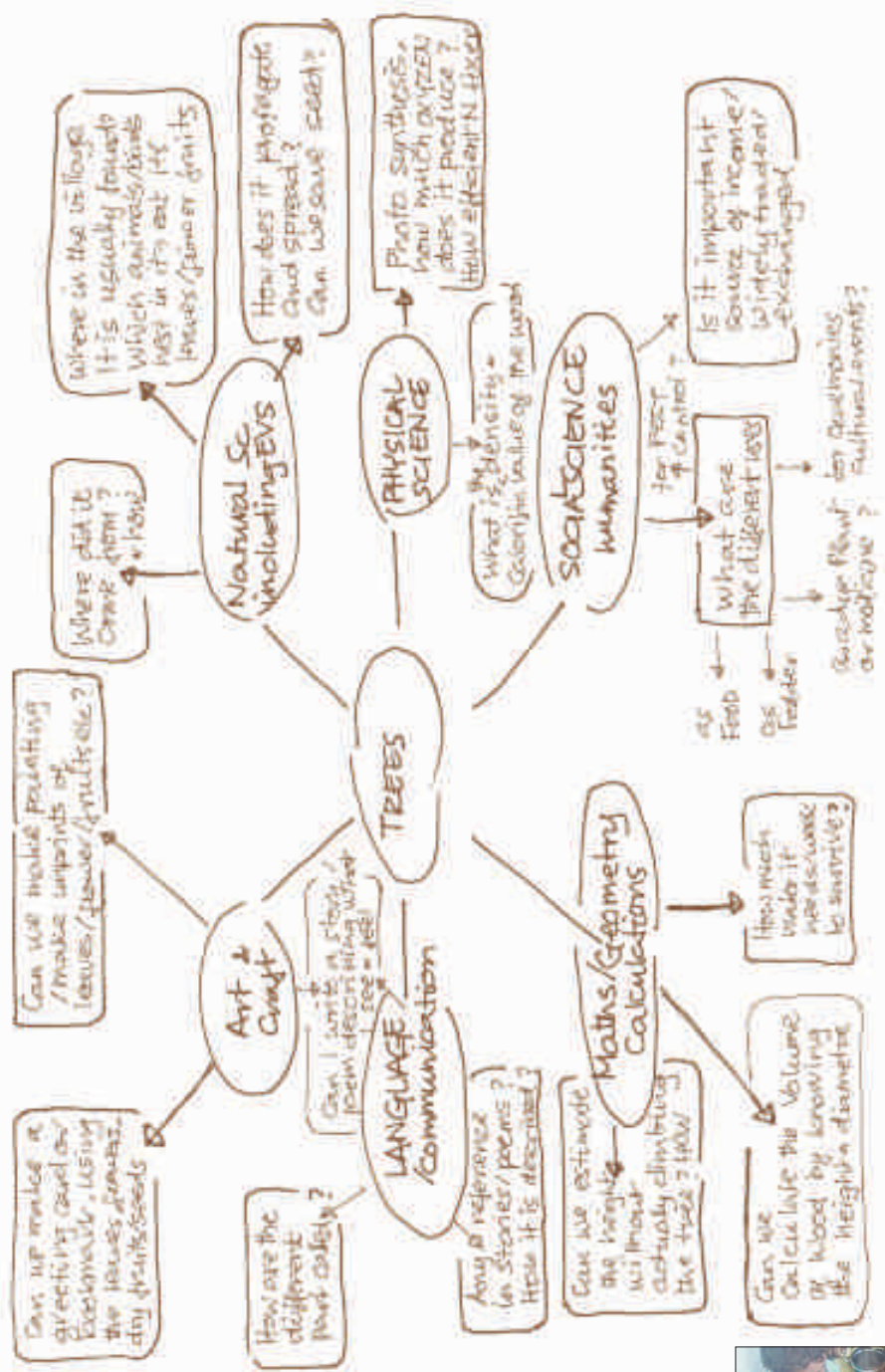


Fig B (Ref Page 5)



Kindergarten children studying local trees

Objectives of PCBE

- x To develop a ^{among the learners,} sense of caring for and belonging to a place and respect for all living things and appreciation for their right to exist, even if they do not benefit us directly.
- x To encourage & support creative / innovative thinking and nurture joyful, confident, cooperative and attentive/active learners
- x To develop abilities & skill whereby learners can identify development issues of the area where they are located and make the school more relevant to the communities and thereby create/improve social relationships / fellow feeling.

School gardens, Home gardens at students' houses, Community managed firewood & fodder forests, raising animals, protecting a water body or hillock, Cooking classes are some of the activities/projects around which the PCBE can evolve

Garden Based learning for example encourages thinking & developing a garden design (choice of plants, allocation of spaces, design of beds/ponds/trellises). It also helps learners to think about maintenance needs and responsibility sharing (rotation plan, holiday plan etc) As things start growing, children focus on their uses / nutritional value, market price, storage and preservation method etc.

An illustrative chart (Box 3) has been provided to generate ^{more} ideas

Box 08

Some questions relate to life and livelihoods

Context

related questions

- Improvement in quantity, quality, stability & resilience of yield.
- Reducing the speed of bio-diversity degradation at all 3 levels.
- Which agro-systems can be used better to reduce our dependence on external & especially non-renewable resources & energy sources?
- Can we regenerate / revitalise degraded resources? How?

- Can we improve storage & transportation of food, fodder etc.?
- Can we mitigate / prevent & adapt to dissident & climate change?

Natural Bio diversity

(Management of Ruminants - Cattle, Pigs, etc)

- How can we sustainably manage forests, wetlands etc (balance their provisioning & ecosystem services and cultural value & value as habitat/home for wildlife)

- Which naturally growing plants are gathered from farms, forests, roadsides, riverside etc. How their availability & use in the long run can be ensured (esp. attention to local culture)

- Can more jobs can be created by agro or forest based craft or by rearing insect or micro-organisms dependent on them (e.g. bees, silkworm, Shellac, mushroom etc.?)

(e. water)

Energy, slow cooking, heat thing, disinfection, food processing etc.

- Can we create a low polluting source of energy be developed to improve quality of life & productivity of tools & machinery used in various livelihoods related activities

Further Reading & References:

① Creative Lesson Plans on Tree, Insects, Water Medicinal Plants, Birds, Rice, Waste, Vegetable, Local Market, Fish etc were published by DRCSC, Kolkata around 2010-2012, Summarising the experiments & findings from a four year project (ENRE) with middle school ^{level} children both in formal & non formal schools & education centres in six different districts of West Bengal (www.drcsc.org)

② The Foxfire book - published in 1972 by Doubleday New York, summarising the articles by children of a mountainous region in Mid sixties and published first as local magazine. The articles are based on children interviewing their parents and neighbours about daily life in this relatively remote region. Several volumes of the book has been published from different cities and in different languages. For details readers may visit their website too! (www.foxfire.org)
The three volumes set can be ordered from Amazon.com both in Printed and in pdf form.

3. Childrens Food Forest - an Outdoor Classroom 1996, Published by FeFL Books, Australia. Authored by Carolyn Nuttall based on her long experience of working with children in early 90's. [she also is a 'Permaculture' trainer, like me and my wife, Satoko]

4. The Green Sprout Journey : Exploring Home Based Ecological Activities with Children published in 2009 by the Earthcare books, Kolkata, Authored by Satoko Chatterjee (narrating experience of ^{raising} own children) written with young parents in mind but can be equally interesting for a teacher. (available from www.earthcarebooks.com)

5. Growlab: activities for Growing Minds; Published by National Gardening Association, Vermont, USA in 1999 Edited by DeLorah Burns. This is an illustrated plant-book with step by step lessons and detailed curriculum on garden based learning.

Can be purchased from www.gardeningwithkids.org for related books & documents visit website: assa.garden.org

6. Zoo in the Garden (part of a series 'Lost & Found Wildlife Classics') Published by 'Permanent Black', Delhi in 2005 reprint of a book originally written by EH Aitke in late '20s as 2 different Publications. Not about teaching method, but good description of Natural World around us Available from ^{orient} Longman Pvt. Ltd.

Ardhendu, aged sixty, has lived in many regions of India and has worked among both and adults in the context of sustainable food and livelihood security. After graduating from Calcutta University, he has completed a Diploma course in Rural Leadership from Asian Rural Institute in Japan, and has worked with several local and international NGOs in India and South Asia. He presently lives in Chandannagar, Hooghly. He may be contacted at ardhendu.sc@gmail.com



Nai Talim: Learning Through Productive Work: a Reflection

Pradip Dasgupta



Buniyadee Shiksha (Nai Talim), the education system proposed by Mahatma Gandhi, is generally believed to be education system based on productive work. But it should be clear to all of us that though productive work is its basis, learning through that work is its' uniqueness.

By now a lot has been discussed about Nai Talim. One needs to go through the writings of Gandhiji in 'Harijan' or 'Young India' to get a clear picture of his ideas of education. Here we need only one line from his writing for our present context:

'.....only every handicraft has to be taught not merely mechanically as it is done today but scientifically, i.e. the child should know the why and wherefore of every process.' (Harijan, 31.07.1937)

The historical developments leading to the adoption of Basic Education as national policy of education are well known. In the implementation part, education through productive work was integrated into the rest of learning process in such a way that it is difficult to distinguish it from other pedagogies of learning. Therefore, it is necessary that the people concerned have some idea of this form of educational institutions.

The Nai Talim system of education was followed in many Gandhian ashrams along with government schools. Ashrams are residential campuses where all the workers stay together in a community living style and share all the work according to their abilities and have a common kitchen.

I had the privilege to be in one such ashram school established by my father Shri Chitta Bhushan Dasgupta in a remote village named Majhihira, presently in Purulia district of West Bengal. My father was one of the first to be

trained in the Basic Training College in Patna. It will be of advantage to briefly describe the life of that ashram to understand how productive work and service formed an integral part of education for the students.

The school had three sections as per age groups: purva buniadi or pre-basic for children below 5 years of age, nimna buniadi or junior basic 5 -10 years, standards 1 -5, uchcha buniadi or senior basic 11 – 13/14 years, standards 6 – 8 and uttar buniadi or post basic beyond senior basic.

A typical daily routine was similar to any other disciplined school. The basic difference was in the lifestyle adopted in the ashram. Students of class 6 to 8 (uchcha buniadi) were divided into six groups. Each group would get a task everyday in rotation for six days a week. Sundays were reserved for special cleaning and washing.

The tasks were:

- Arrangements for prayer
- Helping the cook & serving food during meals
- Attending to sick (rogi sewa)
- Attending guests (atithi sewa)
- Bringing & distributing dantun, for brushing teeth.
- Cleaning toilets (most important)

The productive work included all stages of cloth production (i.e. cotton farming, harvesting, ginning, processing, tapping, carding, scrunching, spinning, weaving and tailoring), wood work, vegetable and flower gardening etc. for all, whereas paper making, soap making, edible oil production by 'ghani' were performed by students of uttar buniadi (above 8th standard) section.

Students up to 5th standard were exempted from all crafts like wood work and other work like digging with heavy instruments which involved hard muscular strength. Like other productive work, rice cultivation was undertaken on a seasonal basis.

Artistic activities like drawing, music, dancing and dramatics were an integral part of the life of the ashram. It should be noted here these were not mere activities but that involvement of child in all these arts makes him psychologically sounder.

The combined effect of all these activities was on the personality of each student. The products of the 'work through education' were of high quality and carried with them a sense of satisfaction of the producer.

It must be noted here that the productive work education that we had received in those years involved learning from the local artisans who had practiced such work for generations and hence were highly skilled. However, this was not merely mechanical, as it is understood in society, but scientific, i.e. the child should know the why and wherefore of every process. Though it was done partially, the seeds were sown and they flourished as I received higher education in general and physics in particular.

A brief discussion of one of the productive work, namely cloth production will be useful.

Stage 1 - Cotton farming

Process: The process of cotton farming involved tilling by bullocks, levelling, sowing, watering, weeding and harvesting. The process gave us understanding of the ability of a particular pair of bulls' pulling capacity if the plough had to move straight. This meant both the bulls needed to be nearly equal not only in size but also of age (biological understanding about animals, age and size dependence of energy and strength of animals). Later we learned in physics that if two parallel but unequal forces act on the same body, it does not move in a straight line. The plough was designed to make a certain angle with the ground, a larger angle would make it difficult for the bulls to pull and smaller angle would make the tilling not deep enough for cultivation. Even in these two considerations, former was more important as the tilling could be repeated if necessary. This also gave us understanding of the type of roots different plants have. The levelling and making rows equidistant involved teaching of measurements and the need for space for every plant to grow in a healthy manner as well as for movement of people

through the rows for harvesting, thus understanding human physique. The fields where we worked were smaller and hence weeding was done by hand. Weeding taught us how some plants had better capacity of survival than others and mostly the useful plants had less capacity than the plants of which we have not found any use yet. It also taught us the difference in the roots of the weeds and useful plants. Thus we learnt physics, geometry, botany and history of discoveries with this part of the work.

Stage 2 - Cotton processing

Separating cotton from the bulb shell, separating seeds (ginning), cleaning and rolling into punis (cylindrical shapes for spinning).

Cotton processing involved plucking the cotton bulbs by hand. An essential component of this part was judging the bulbs that had matured enough for plucking. Periodical movement through the rows of cotton plantation was necessary as all the cotton bulbs could not be plucked at the same time. The raw or wet ones would not have properly developed fibres and late plucking would have damaged fibres. This again gave basic understanding of plant life.

The ginning is a process of separating cotton fibres from the cotton seeds. This would be done by hand on a small scale when the harvest was dry enough for this separation process. The pressure applied and speed had to be just right for gentle separation without tearing the fibres. The hand operated ginning machine had a pair of parallel cylinders with parallel lengthwise grooves on them through which the bulbs were passed by rotating a handle. The gap between the cylinders was critical. A large gap would allow the seeds to come under the separator and get crushed, while a smaller one would break the fibres, making the cotton useless for spinning. Further processing involved similar skills and knowledge.

From the entire process we learned the nature of cotton fibre, its length, breaking stress and hence



Cotton Bulb

the gentleness of pressure required for handling of fibres before being converted into threads. The strength of materials would be one of the topics we studied at a later stage. Such learning has better impact than laboratory testing done only once in the laboratories.

Stage 3 - Spinning



The box charkha (a technological marvel by itself)

The box charkha was an intelligent piece of machinery developed during freedom struggle under the guidance of Mahatma Gandhi himself to popularise spinning, increase efficiency and improve the quality of the thread.

The role of “charkha” in freedom struggle is well known.

The original charkha had one large wheel turning the spindle. The large size of the drive wheel was necessary to provide sufficient number of rotations to the spindle for turning the fibres into thread.

The large size of the spinning wheel had reduced portability. It was necessary to have an instrument which was more compact, easy to assemble and easy to handle. The khadi workers could carry the small and compact box charkha from village to village, thus making the khadi movement popular.

The box charkha itself gives fundamental knowledge of pulley system, friction, tension and entire idea of rotational motion, so fundamental to anyone learning physics and mechanics. Anyone will understand most of the points by just looking at the picture, the rest will become clear when one actually starts working with it.

Stage 4 - Weaving and Stage 5 - Tailoring (can be similarly understood)

Some of the skills and qualities that all the productive as well as other forms of work developed in the students (particularly me) can be listed as follows:

- Procedural understanding
- Cause and effect relationship
- Sense of proportion, measurement, alignment

- Cost effectiveness
- Environment and conservation of nature
- Spirit of enquiry
- Human qualities such as compassion, brotherhood, team work, etc.

It is generally believed that Nai Talim system is only suitable for menial work and not for intellectual work and the students from Nai Talim are not able to cope with modern higher learning. My personal experience has been otherwise. Barring the initial stages of higher education where I had faced difficulties due to lack of knowledge of English as a language and change of domain leading to cultural difference, I had no difficulty in learning or teaching (some information regarding the same is given below). The above mentioned qualities made others view me as a different person. The same is the experience of several others who have been educated through the Nai Talim system.

Some of the claims made above can be substantiated from my personal experiences. As a student, due to insufficient knowledge of English, I faced some difficulties in theory. However, in experimental physics I was treated as better than most of my batch mates due to the skill of understanding how a piece of machinery and its components work. Even though we never had any electricity in those days, I was able to understand the working and principle of working of electrical as well as some advanced electromagnetic optical apparatus. As an M.Sc. student, I had faced a challenge with an out of order apparatus for the Zeeman Effect, an experiment in atomic physics involving powerful electromagnets, high quality optically parallel glass plates and a special prism. It was not difficult for me to understand the repair to be done, which I carried out myself once I had received the instructions from my teacher.

As a teacher of physics I worked in a department with others. My Nai Talim background helped me to understand every situation better than most of the others. It should be recalled here an ashram life gives you a background of team work where co-ordination amongst every member of the team is of extreme importance. The college where I had worked had classes from 11th standard to post graduate level, all three streams- Arts, Science &

Commerce, with about four thousand students, over two hundred teachers and other staff members in a four storied building with only 15 class rooms. After studying the pitfalls of the system, I could propose radical changes in the time table of the entire college which was highly appreciated and implemented.

As a teacher, I was able to reach out the students much better than most of my colleagues due to the procedural understanding I had developed as a student of Nai Talim. I could pick up new knowledge from even my lab attendants as a habit due to the spirit of team work. This helped me to move forward even when in unfavourable situations.

I must admit that learning from artisans who did not have sufficient knowledge of the laws of natural sciences had its limitations. They could explain the reasons behind each step of the production, but were not able to give generalised rules that are so important in pure science learning. On the other hand, in the formal schooling system, it was/is the other way round. The laws and rules were very well taught without knowing their application in real life. (We often hear that the graduates today are 'unemployable').

The challenge before us is to link this knowledge with different areas in our life and put them in practice. First and foremost is identifying the fields where the action should be focused. As teachers are the people who will convert the concepts into practice, teachers' preparation is being given the top priority. In the content front, NCERT has done a commendable work in preparing the curricula and text books keeping in mind the needs of the modern world. What is necessary is to prepare modules of translating the knowledge into small and comprehensible units relating daily work in general and productive work in particular and preparing ground level teachers to use them. It has been proposed that teacher preparation has an initial stage of exposure to Nai Talim, followed by orientation programme and then assisting them in putting these in practice. It is necessary here to draw attention of all to the fact that it is necessary to have ashram type living, where sharing and team work is an essential ingredient along with productive work to make this scientific education socially and economically meaningful.

Work has already begun for the same. We need to turn this into a movement.

Pradip Dasgupta is a visiting faculty for introductory laboratory course in Centre for Basic Sciences, Mumbai University and Department of Atomic Energy. He is also a resource person for Junior Science and Astronomy Olympiads, Homi Bhabha Center for Science Education, (T.I.F.R.), Mantri at Nai Talim Samiti, Sewagram, Wardha and President, Majhihira National Basic Educational Institution, Purulia district, West Bengal. He has previously worked as Physics teacher for +2 level in Siddharth College of Arts, Science & Commerce, Mumbai (established by Bharat Ratna Dr. B.R. Ambedkar) for 36 years. He may be contacted at pkd.1955@gmail.com



From the Field





Where Children Construct Knowledge

Amit Bhatnagar



For education to be liberating, learners have to be active subjects not passive objects as in the present education system - Paulo Friere

Work is inextricably linked to learning. If our education system pretends to have something to do with learning (not just creating a work force for industry) then it has to incorporate work in its curriculum. It is a must.

It should be very clear that work in education has nothing to do with vocational training. This is just skill acquisition which most people in vocations learn on the job.

We are sharing an example of a malnutrition study which lingered into bio-diversity, impact of market on nutrition, etc. The study was done by middle school children and won the first prize at the state level of National Children Science Congress.

At one point, for two reasons we were desperate to have a doctor associated with the school. One, our idea of the Adharshila Learning Centre was of a place where we indulge in activities going on around us in villages and those which we thought were needed or which the children wanted. Two, we wanted to link our educational activities to other related fields. Malnutrition in children was one important theme.



After informal surveys of children coming to our school, we realised that many children had suffered malnutrition or some prolonged disease in early childhood. Also we know from our experience that during pregnancy, mothers almost never get any extra diet. In fact they don't want to eat more as they fear that a bigger body will create difficulties at delivery. And of course government statistics tell us that more than half the children suffer from malnutrition. We realised that malnutrition in children and pregnant mothers had a direct bearing on the academic and other capabilities of children and hence the importance.

Finally we got an Ayurvedic doctor who actually knew how to make some interesting things like Ayurvedic tooth paste, balm etc., which he taught the children. We devised a programme to check out the health of children in the surrounding villages. In a few classroom sessions the children learnt to identify malnutrition not just by height and weight but by looking at skin, hair, nails, eyes, swelling etc.

Teams of children went around in surrounding villages, looking at children and tabulated the information and found the number of children suffering from varying degrees of malnutrition – Grade I to Grade IV in official parlance.



Now the question was – what to do about it? Two suggestions came up:

One was to make a supplement to give to the malnourished children. Most probably this was influenced by the sattu – provided in schools in lieu of mid-day meals.

The other suggestion was to motivate children to go to the hospital. At that time there was a scheme where severely malnourished children were admitted to the hospital and the attendant was to be paid a minimum wage.

The supplement was well received but, while some families bought it they found it expensive as all the children in the house would eat it. Almost nobody went to the hospital.

The doctor on his own initiative put the news of the survey in the newspapers. As malnutrition deaths are a very serious matter, the administration responded by sending a big district level team of doctors to hold a health camp in a nearby village.

Next year, while doing a science project, some children were surprised to know that malnutrition was so rampant. They were under the impression that theirs was a modern farming area. People were using hybrid seeds, chemical fertilizers and pesticides. They were selling tractor loads of cotton and soyabean. The children also had the impression that people were well off in the area. There were many motorcycles, tubewells, motor pumps in the village. Many people were in some job or the other. So how come there was malnutrition amidst seeming prosperity?

So they set out to explore what the people were

eating. They were also asked to interview elders in the village to find out what they used to eat when they were young.

The children interviewed more than twenty older men and women and listed 130 food items between them. These included absolute delicacies ranging from varieties of mushrooms, leaves, flowers, tubers, seeds of plants, rare fruits from the forest, three or four varieties of honey and many resins/gums, exotic meats and fish, crabs. Almost 70% of the items came from the forest and river. The farm food crops were also full of diversity. The children listed and collected seeds of more than eleven varieties of jowar (sorghum) and at least five or six types of grains. Hey! We forgot the milk products. Those who had cattle had abundance of milk, curd and ghee. Those who didn't, at least got free buttermilk.

Basically we learnt that the loss of bio-diversity in farms and total depletion of forests had a very strong connection to loss of variety of food.

Now the children next examined the reasons for the loss of forests and farm diversity.

Once again they came up with stories of how deforestation took place when contractors came in trucks. The people worked to cut the trees for 25 paise a day. They also heard 'once upon a time' stories, when people never needed to go to the market except to buy salt and later for kerosene (previously they burnt castor oil, which they themselves extracted). And they told this with great pride. Gradually people were taught to buy things – for example, bidis – distributed free in weekly markets, urea – literally thrown by the local traders, black tea offered free after a long trek from the mountains.

This has led to the people becoming so dependent on the market and credit system that they are forced to do farming for cash. This has resulted in displacement of food crops by seemingly more profitable cash crops. The best lands previously reserved for maize and jowar was now taken over by cotton and soyabean. Food crops were shifted to low quality land. Oilseeds have almost vanished. There is hardly any diversity of crops in the farm.

The whole exploratory process gave the children

new insights and some ideas were fixed in their minds. This study was selected to participate in the National Children's Science Congress. The chief guest at the National Science Congress was Prof. APJ Kalam. From the dais, he was explaining the benefits of bio-diesel, from both the environmental and farmers' viewpoints. While examining the project, the judge asked the students how they justified their anti-cash crop stand as Professor Kalam just said that "planting bio-diesel is more profitable for farmers." Without batting an eyelid Suresh, one of the participants, replied that the President doesn't know about farming. If farmers start planting plants for biodiesel they will die of hunger and become totally dependent for food on the market! The judges had never thought that they could critically look at someone of the stature of Professor Kalam.

The confidence of knowing something is a very big thing. We were all the more excited when we realised that studies by the Food and Agriculture Organisation and Dr. Vandana Shiva had also come to a similar conclusion of linking food insecurity with loss of biodiversity. But still the government programme to fight malnutrition is hooked only to mid-day meals and food supplements.

The findings from this health/local history research done by children was published as a small booklet titled – 'Khichdi biscuit ki behas ke aage', as at that time some MPs were lobbying in the parliament for a French biscuit to be given instead of cooked meals in the mid-day meal scheme as it supposedly contained all nutrients.

But what did the children learn?

Besides what the children learnt about malnutrition and its reasons and local history, there are subtle messages which they get. For one, all the data was collected through interviews of village elders. One of the learnings was that knowledge is not confined to books and the literate. 'Illiterate' adivasis too are knowledgeable. This is a big boost to confidence, especially for adivasi children as in the standard schooling they invariably end up with an inferiority complex about their society and culture.

Apart from that, they learnt to tabulate data and draw conclusions. A lot of basic math was done – percentages, averages, addition, division etc. Of

course they had a lot of practice in listening, writing, editing what they had written. Translating from the local language to Hindi was a big task. Presentation skills were developed, mainly making charts and reports and then explaining the charts to the audience.

You may be wondering what this narration of children's work has to do with 'Work and Education'. But it seems that this is Work and Education! We learnt that such work done by children classifies as Work and Education when we were told that one of our student projects of research on the theme of Famine was cited in the Work and Education Paper taken out by the NCF group.

So now we have learnt to narrate such projects when asked about Work and Education!!

Conclusion

There is a lot of learning happening when children explore things/issues in a free flowing manner which is the way learning happens in the normal course of life. Over time very few things are retained, most recede to back alleys of the brain. In this natural system of learning, we are never forced to quantify what or how much we learnt. But the problem with school curriculums is that they always want to quantify learning outcomes and judge children based on this. This creates tension in children and also teachers who engage children in such projects. So it was necessary for me too to write that they learnt Math, Hindi, tabulation etc.

This is, no doubt, a very nice and engaging way to learn, but sadly, mainly because of our exam-based evaluation system, most of our schools are not structured to handle this. Another limitation is how we view time. We are constantly worried about children 'wasting' time and hence trying to engage them in some meaningless activity or the other. Also we have to finish a list of topics in a given time frame. Learning is secondary.

If we really want to incorporate work as a way of learning then it will need a radical change in the system and structure of school and the mind-set of teachers. That it can be done has been demonstrated at Adharshila Learning Centre and many other innovative learning centres.



Amit is a social activist turned educationist. He left his architecture course to work amongst adivasis of Madhya Pradesh where he was instrumental in building a people's organisation with other colleagues. Interested in cultural work he has written many inspirational songs and plays based on social themes. Feeling restless and frustrated with the limitations of the education system, his wife and he started the Adharshila Learning Centre with the Adivasi Mukti Sangathan in Barwani district. He may be contacted at adharshila.learningcentre@gmail.com



Work and Education - Thulir's Experiences and Reflections Anu and Krishna



Selvan (name changed) approached us diffidently. "I want to learn. Can you please help me?" A hesitant youth of 16, he haltingly told us his story. "I have failed in four subjects in my class 10 board exams, and have stopped going to School". He clearly saw himself as a failure in the academic world.

Selvan is just one among the thousands who are left behind as failures in our education system. The formal education programmes in our country are heavily biased towards teaching and learning of academic skills. This is based on our firm belief that academic skills are a way towards empowerment. Often, the superiority of academic qualifications over more traditional vocational skills is over-emphasised by teachers and the system. The institutions providing vocational training are badly neglected and have poor patronage.



We first experienced this gulf between the academic and the vocational 25 years ago, when we, as Architects working in a rural area, began to teach masonry skills to rural artisans. We were focussing on environment friendly building technologies that used local materials such as mud. The masons in rural areas were generally uninterested in building with mud and local materials, and so we were forced to work with so called "unskilled labour" i.e. youth who in fact were well versed in traditional practices

of constructing with local materials. We initially started teaching them to produce various improved building elements and practical masonry skills. Our training was useful for them to build for themselves and for their neighbours and earn better wages. But they were still diffident in using their new skills in front of bossy contractors and masons and would never assert themselves. To overcome this, we decided to teach them useful techniques such as calculating and estimating quantities of materials required in construction, technical drawing and reading plans. We tried to enhance their reading, writing and arithmetic skills a little, just enough for them to take and execute small contracts by themselves without depending on other conventional contractors or masons and get a better income.

We did manage this to some extent, but the general feeling of being unlettered and uneducated among the artisans was difficult to overcome, as was their lack of confidence. The fact that they were "dropouts" from schools, and hence certified "failures" was like an enormous millstone around their neck that was difficult to get rid of. These were adults ranging from age 18 to 32. We felt we needed to work with younger age groups, and over longer periods, if we were to make a significant change in





their self-image of being “uneducated”. Over the years we brought down the age of the trainees we were working with as well as increase the duration of training sessions and their scope. We were generally successful in getting them to learn skills, have confidence in their ability to take up projects, complete them successfully and deliver increasingly higher quality constructions. Their income levels went up and they were more confident in traveling to far off places to take up work among people of other communities. Yet, the lack of formal education was still a big void hard to fill when it came to their self-perception. Society too does not give them their due recognition both socially and economically, however talented or skilful they are.

We then moved to an adivasi village, Sittilingi, 10 years ago and started Thulir, a learning centre for children and adults to learn and discover the joys of learning. It was created as an informal centre where students going to schools could come after school hours and during weekends. Sessions varied from story-telling, reading, learning basic language and arithmetic to science activities and various arts and crafts. There was to be no enrolment, attendance or fees and so students could come entirely on their own volition. We believe that learning happens best when there is self-motivation.

Within a couple of years, a few students who were age 14 and above and had opted out of school, started using the centre full time and asked us to help them learn. Selvan, whom we talked of earlier, was one of them. These students said they liked being in Thulir and could not cope with school (after class 8 students had to go out to non-adivasi village school far away). Their basic academic skills were very poor or were completely non-existent and

confidence levels very low as had been branded “failures” by the system. So it did not make sense for us to start with basic reading and writing skills alone. We decided to introduce “hands-on” work, as we thought this would give an opportunity for them to engage in an activity where they were more confident of themselves, and through the activity, introduce writing and basic math skills. This is something we had done earlier with our building artisans training programmes.



We started with electrical wiring as many of the first batch students were interested (it was then perceived to be “cool” as you didn’t have to work in the sun and dirty your hands!). Coincidentally, an opportunity presented itself, as an expert electrician came to the village from Chennai to do some work for a neighbour. Bee-keeping was next as friends from an NGO offered this training for adivasi people specifically. Slowly, we added plumbing, masonry, bamboo furniture making, cycle and motorcycle repairs, Solar PV lighting, LED bulb assembly, computer skills, organic farming etc. The attempt was to, as far as possible, take on real life projects in and around our campus, so that the results of the projects are utilities and services that get used by the community. This we felt would make the work meaningful and give a sense of satisfaction and pride. Moreover, one would also see how well ones’ effort fares in real life thereby getting feedback for self-assessment and improvement. They learnt to write about, keep records for and do the calculations relevant to each particular project. For instance, if they were growing rice organically, they would learn to measure the area of the field, keep a record of labour and material inputs, maintain a graph of plant growth both manually and on the computer, keep accounts etc. If they were constructing a wall, they would learn to draw plans, estimate the number of blocks required, calculate expenditure and so on.

There were a few main reasons for consciously introducing a variety of hands on projects – firstly, there is limitation in scope for one kind of activity to be repeated many times in a given campus or community. Secondly we felt it was important for each student to experience more than one or two types of work, so that they could begin to become conscious of which type of activity they are naturally good at or interested in pursuing further. This way different students could choose different types of vocations if they so desire and still find work opportunities in the area. If we were to train all of them in a single vocation, say as masons, it would be difficult for all of them to find work in the local area. We also felt that as 14 to 18 year olds, they were not yet ready for choosing a vocation and needed time and space to discover and develop their interests.

It was important that they experienced a variety of learning situations; crafts, music, sports, languages, interacting with people from other cultures, etc. which they had missed out at school. Once they chose a vocation, specializing in it could happen as apprentices under professionals and experts for a longer duration (some years at least) and in real life projects. Conventional short term vocational training courses are hardly effective or useful.

Selvan, who came to us as a shy boy who was very aware of his shortcomings in academic skills, spoke very little and refused to make eye contact, flourished in this practical learning environment. Soon it was obvious that he had excellent qualities. He was gentle and generous, highly skilled in working with his hands, taking on any challenge head on and trying his best. He worked patiently with others. He could take on the most delicate repair tasks such as fixing mobile phones with the same ease as doing physically demanding tasks such as repairing roofs and making bamboo furniture. He showed a special flair in electronics and could even take apart and fix equipment he had never seen before.

We started getting batches of 6 to 15 such students each year. They came to us as "failures" and "drop-outs", with very little self-confidence and lots of fear. But we found that they were quick to pick up practical skills and did excellently. Their self-confidence grew and extended to all spheres of

their lives, even academics. Soon their parents started putting pressure on them to finish class 10 exams and the students too felt this need to prove themselves to their peers in the village. Slowly one by one, with our help, most of them finished writing and passing this exam as private candidates while coming to Thulir for our programme. The interesting outcome was that the Thulir work programme seemed to give confidence to the students to tackle academic exams which they could not earlier. Many decided to continue higher studies enrolling in class 11 in schools outside of our valley, some even at the age of 19 and 20! Some have gone on to Colleges for degree courses.

A few of our students had to get back to work at the family farm. A few, whose families faced serious financial difficulties, had to go away to work as unskilled labour. A few have taken to working as masons and carpenters. Four of our students, including Selvan, joined back as staff, teaching younger children and taking responsibilities for administration and campus maintenance.

Over the years, the village has undergone many changes. From being farmers growing most of their food themselves (mostly rain fed millets, chicken, goats), the villagers have now started eating PDS (Public Distribution System) rice and growing water intensive cash crops. Their cash requirements have grown with easy access to private schools and colleges, health care, loans for buying motorbikes, tractors etc. There is a strong feeling in the community that degrees would lead to better jobs (usually government jobs). There is also aggressive marketing by private English medium schools and more importantly by private colleges that are far away (up to 70 kms. away) but offering daily bus services at their door steps for commuting. Very few want to learn a vocation or skill anymore.

The overwhelming message that schooling seems to instil in the students and their parents is that only white collar jobs are worth having and that vocations that involve hands- on work are meant only for the failures from the system. This has meant that courses that teach vocational skills such as the ones at various ITIs (or ours) now have very few takers. Coupled with this, hundreds of colleges have mushroomed offering all kinds of degrees, so that

any parent who has the financial means can send their child to a college for a degree. The sad truth is that most students who have passed school do not have the necessary academic skills to pursue an academic degree course, or even an ITI course, with any kind of seriousness.

Selvan has grown in confidence now and has become one of the most sought after skilled technicians in the area. But the pressure to prove himself academically still nags him. He went back to high school at the age of 20 spurning an offer of a job in the city as an electronics technician with modest pay, and is now in college. Academic learning is still a huge hurdle he is struggling with, but he is determined to overcome it and get his certificate. He realises that his self-esteem and the respect of others depend on his getting this vital piece of paper.

Given this situation, what is the scope of hands-on work in schools? Most rural, Adivasi and first-generation learners excel at this and so it would give such children greater confidence to tackle academic subjects. Urban children would probably be at a disadvantage in hands-on work, and so would need to put in more effort at learning. This would be an eye opener to them. Not only would this help inculcate in them a healthy attitude towards the hands-on skills that are vital for any society to survive, but it would also increase their respect towards the people who possess these skills. It is important to bring a change in the attitude of our society to manual labour (which in today's context would include all kinds of manufacturing and service industry jobs that require ability to work with machines and tools). This would also help the people in this sector to work as important and valued contributors to our economy and society, instead of feeling that they are dropouts who could not make it to the "superior" white collared jobs.

Today, schools operate as islands cut-off from the community around them. Children are naturally inquisitive about adult work and feel important whenever they are allowed to take part in it. A school does consume a variety of goods and

services that brings it in contact with the community around. These can become learning opportunities where children can interact with adult work and the community around. Many thinkers in the past, like Gandhiji and Vinobha had proposed integrating work and academics. There have been many interesting educational projects, such as at Vigyan Ashram in Pabal, where this has been tried. There are several essays and attempts even in the west at bringing in "work" to schools such as in the "studio schools" in UK and teaching vocational subjects as part of mainstream schools in Finland. Perhaps it is time we gave it a serious thought in our country.

Education today in our schools concentrates only on improving cerebral skills. Rural, Adivasi and first generation learners are at a disadvantage in this system. Education should focus on the "head, heart and hands" where Academic skills, Art, Craft, Sports and Work in the community have to be given equal importance.

Imagine a world where an integral part of a school education was practical, hands-on work. What if the curriculum included real-life projects inspired by the needs of the school or the community? Practical work could act as an equalizer. Our education system would be more balanced and fair to all strata of society. The school gets rooted in the community. In such a world, the Selvans of our country would not have felt inferior, struggling to straddle two different worlds, but would have flourished in their chosen fields as equals!



Anu and Krishna, both trained as architects, have been working with Rural communities for the past 25 years, exploring Alternative Building Technologies, Skills training among Rural youth and Alternative Education. They may be contacted at thulir@gmail.com



In Search of Teacher-ness (Shikshatva ki Khoj)

Binduben



I was just lying down after returning from the school, when someone knocked on the door. Vijay, from grade 5th and Rakesh from grade 6th were standing at the door. They entered and demanded,

‘Ben, we want bhakhri’

‘Please, I am tired. Not now,’ I replied.

‘But Ben, we will help you. Please do it.’ They brought me to the kitchen.

I know making bhakhri is my one of the favourite tasks, and eating is theirs! It has happened several times. I just thought, do children have the right to force me to do this? What is that element which forces me to make the bhakhri even when I was tired? Perhaps it is my training, during my education, may be it is the Nai Taleem which is part of my past.

My primary education and professional course for teachers was completed in Lokbharati, a pioneer institute following Nai Taleem. I completed my secondary education from Gram Dakshinamoorti, Ambala, which is a well-known Nai Taleem post-basic school, now a heritage school. As a student, I never had any extra tuition or even additional books like guides to support my studies. If we had any difficulty, we just went to the teacher’s house always on the campus as a part of the Nai Taleem philosophy. They never said no. The word ‘punishment’ was not in their dictionary.

Chhatralaya (hostel) life is one of the non-negotiable aspects of Nai Taleem and taught us democracy, something new in our society where our decisions were always made for us. Chhatralaya promoted participation.

Nai Taleem is based on

1. being residential
2. doing productive work and dignity of labour

3. education in the mother tongue

4. being co-educational

Residential Education:

An important part in Nai Taleem is the daily schedule, which is split into two parts. The first part may be for three hours (7 am to 10 am) and the second from 2 pm to 5 pm. These six hours of theory are supported by tasks like working in Chhatralaya, playing, prayer and many other activities which help to absorb daily learning.

In Lokbharti, festivals, which are usually holidays, were fun as we celebrated all of them. On Uttarayan all of us enjoyed eating sugarcane, provided by the institute. It was the same on Rakshabandhan. Festivals were really holy days, with folk music and dance. This was only possible because it was a residential school.

We had ‘parents’ on campus. During my hostel life, my parents were Arunaben and Raghubhai who took very keen interest in us, only next to our parents. Although they joined in our fun, they checked our behaviour and helped us improve. They allowed us to have fun, but as our guardians, they were always alert. Once I failed in a test. Raghubhai taught me and when I got full marks, he was happier than I was.

I would like to mention some of our very interesting collaborative work. One was khajana ni shod or treasure hunt and another was community lunch or samuh bhojan. Such activities increased our community feeling, leading to social development. The area for the treasure hunt was very large, sometimes nine to ten kilometres, through hilly terrain and would take even half a day. When we returned, lunch would be waiting. We would eat with our teachers.

Self-cooking included breakfast, lunch and dinner.

We were given a limited budget and we had to plan and cook the meals ourselves. Dinner was with all the students, teachers and their families. Everyone had to participate and this made the food even tastier. Today we know it was social building process. Nai Taleem is not just training, it's a capacity building for citizenship.

Today our schools are exam-oriented schools, not life-oriented. Though my school was not exam-oriented, we were serious about our exams. This was because what we were taught was for our life, not just the curriculum. We would revise our lessons under a mango or chikku tree, where we prepared very seriously for our exams. We would go back only for our food. Our seniors were strict with those who talked too much and they would wake us in the morning. There were no 'teachers' – we did everything ourselves.

On examinations days, we had the liberty to sit anywhere in the classroom which was anywhere on the campus. If we didn't understand a question, we could ask. During the final exams, which were in the summer, we got iced lime juice or fennel juice, served lovingly by our seniors, like our own elder brothers and sisters.

After this glorious education I became a teacher in 1989. First 12 years of my teaching life I spent in Bhavnagar district of Gujarat. I always try to provide love and support to the children, who are like my own. I felt that what I had got from my 'family', I can pass to my students.

After 12 years of education I realised that if I want to give 'total'/holistic education, my students and I would have to live together so as to make education a lifelong process. After marriage, I moved to Rajpur School in a small village with just about 300 people. At first, I travelled 23 kms. everyday. I wanted to move to the village but could not as there was no proper sanitation facilities. Now we have got the convenience and have moved, and although my husband has to travel 50 km to his office, he happily accepted this for my dream.

Rajpur primary school is a 'normal' government primary school. Nothing special, except that as a student of Nai Taleem, I have started applying its principles. We know the village well. There is

superstition, bad habits like drinking, etc. and I thought I should start reforming the village, beginning in the school, which is the place where the basic foundations are laid.

Most of the villagers believed that if one gets ill, s/he should take a vow to god but not take medicines. Child mortality, infant mortality, maternal health are key issues. Even buffaloes are at risk because of such superstitions. We started by giving glucose and some fruits. We also started to say, "let us take both the vow to god and medicines". We got the result we wanted! People were benefited. At the same time in the school, we started with cleanliness. Nail-cutter, comb, towel were our key instruments! Change was not very easy but by recalling Gijubhai Bhadeka's Diwaswapna, we were able to spread the message. We also started to stitch their clothes, and teach them how to stitch buttons on the shirts. We planted trees on the campus after cleaning it and after two years, everyone's health has improved and absenteeism is almost zero.

Sacrificing goats is very common in the village. Although I know the entire village is non-vegetarian and I have no objections, I felt animal sacrifice is a superstitious belief and I went on a day's fast to show my disapproval. The villagers were shocked but sided with me. So the common sacrifice was stopped, but individual homes continued the practice. After some more fasts, they finally agreed to stop and now make a sweet instead of sacrificing an animal.

It is Nai Taleem which taught me to think. This process of thinking helped me a lot in many cases. Early marriage is one of the big challenges of our village. It is very common that a girl of age 8 to 10 gets married though married life may start later, when she is around 14 -15 years. We all know that early marriage is not only against the law but early child-birth also creates numerous health problems. As a teacher, I know that it can even result in children with learning difficulties, extra marital affairs and other related problems. For instance, I got involved when a Grade 7 child was going to be married. Though the parents agreed with me, they could not stop as it was part of a 'chain'. So she got married but stayed on in our village till the 10th class with her in-laws' support. This is not an isolated

case. It is a social evil which will be eradicated only when the whole of society agrees.

I already mentioned belief in superstitions. For example, if someone does something wrong, that person will act as if a spirit is occupying his/her body and that spirit is acting wrongly. The person is taken to a bhuva (exorcist) and various things are bought to get rid of the spirit. We have discussed this and the children agree that there is no truth in this.

Now about constructive work. We know all this happens because of poverty and the best persons in any family to make changes are the women. So we have started a self-help group in the village as well as a students' bank. Today we have more than two lakh rupees in the SHG and a little under a lakh in the students' bank. They have a voice in the family and have become financially independent.

Democracy is the biggest thing in the society and the basis of democracy is in the school. We started a students' council in the school. Every year students have to elect six or seven students to the council. The whole school is managed by the students. We have identified the tasks in school, such as cleaning

of the school, drinking water, conducting the prayer, looking after guests, the garden, etc., all managed by students with the authority to make decisions. For example, should the school have a uniform and if so what kind? This concept of a student council is helping us a lot in the village also. Now after 12 years of our practice, many of our alumni are older and have become the decision makers in the village. Their process of making decisions is democratic and allows all voices from the village. As a part of democracy, we also apply the concept of bal adalat or Students' Court. There are so many small issues in the school and home which may not appear very large to us, but to them it is very important. The issues are written down and put into a box and on Wednesdays, instead of prayers, there is a bal adalat session. This consists of two members of the students' council, two students from the rest of the school and one teacher. This helps us to educate children who are in need of guidance.

And finally, I say that even day-scholars are a part of Nai Taleem - outside of school hours, they are either in the school or at our home. This is by choice and we are enjoying it!

Binduben works as a government primary school teacher in Rajpur primary school. Her affiliation with the school is since 1989. She was born and brought-up at Lokbharti Sanosara. She has been involved in writing and reviewing textbooks for more than a decade. In 2006, she was awarded the best teacher award (Chitrakut Award). More recently, she was awarded the "Ma-baba Award" from Nai Talim Sangh, Wardha for her contribution to village development through education. She may be contacted at parthesh.pandya@ceeindia.org



Our Land, Our Life (Hamari Dharti, Hamara Jeevan)

Diwan Singh Nagarkoti



The environmental education subject 'Our Land, Our Life' is being taught in the schools of Uttarakhand in a formal way. The teaching of this subject was started on an experimental basis in 1987 in Gandhi Inter College, Panuwanaola of Almora District. It is now being taught in the 6th, 7th and 8th classes in more than 1000 schools of Uttarakhand, as an optional subject in place of agriculture, craft and home science. It is for the first time that NGOs (Uttarakhand Sevanidhi, Gandhi Inter College Panuwanaola and Mirtola Ashram), Central and State governments have jointly developed a curriculum based on the topic of the local environment. Later it was incorporated into mainstream education. During this journey, the curriculum has been revised four times based on the suggestions of experts and the experiences of the teachers and the students. It has also been made suitable for the field districts.

Initially it was an additional subject in the 9th and 10th classes in the 39 schools of the hill region, later modified for 6th to 10th classes based on the suggestions of the education depts. of Central and State Governments and also the subject experts of NCERT and introduced in the 6th, 7th and 8th classes in the schools of the hill districts.

Subject Matter

In this subject, based on the village ecosystem, sustainability, carrying capability and the whole village ecosystem is studied as a unifying concept. Included in this are the study of the ground, construction of the map of the village, measurement techniques and the mathematics involved in it, village history, growing tree seedlings, natural flora of Uttarakhand, soil formation, water carrying capacity, spring flow measurement and domestic water consumption, measurement of rainfall and analysis of data, crop, firewood, animal

bedding, grass, compost measurement along with village support area rehabilitation, growing saplings of tomatoes, organic farming, and principles of good land measurement. These have been covered in the 37 chapters for class 6th to 8th. Reading material is also provided. It is also required to carry out some practical exercises in a few nearby villages. Some exercises can be done within the school itself. Students have to work in teams.

Environmental Teaching - Some experiences

Prior to joining the field of environmental education, I did not have much experience in teacher-training. I came into environmental education for working teachers after joining 'Uttarakhand Seva Nidhi' nineteen years back. Before this, my experience consisted of research studies in various fields like primary education, environment and development. After participating in movements on forest and environment issues as a student, I took part in the environmental camps organised by Shri Chandi Prasadji where I learnt the rudiments of environmental issues. Of course my childhood was spent in a rural setting so I have a feel for it. By participating in the various study projects I got an opportunity to understand the local lives in more than 500 villages in the various parts of Uttarakhand. In the beginning, I could not find myself agreeing to the curriculum of 'Our Land, Our Life' It took some time for me to understand the perceptions of free grazing, and degradation of the land due to overexploitation and deforestation. Earlier, as per my previous experiences, I tended to side with the village community. But when I learnt the correlation between events, such as the grass (lands) and the trees getting destroyed due to the prevailing grazing practices and how fodder collection activities denuded the trees, my preconceptions quickly changed. But some questions remained, like why children should work

in the fields and whether there is enough land for everybody. The arguments of M G Jackson and Madhav Ashish Maharaj, whom I met while on a visit to the Mirtola Ashram, were that those children who go through this curriculum will do a better job when they grow up to become doctors, engineers or teachers. They would prove to be good planners if they opt for administrative job. Those who are unable to continue their studies or get suitable employment, can lead a fulfilling life in their villages using the skills learnt here. The wisdom which I gained while working with the teachers, children and the community, gave me an ability to understand the environmental problems at the levels of the cities, metropolitan cities and also at the global level. For the last eleven years it has been a pleasant experience learning with the teachers during teachers' training, discussing with the children in the class as well as outside the class and holding continuous dialogue with the teachers.

Interaction between teachers, students and the community

Teacher in the role of a catalyst

Looking back at my experiences with the environment education, I have found that the teachers, students and the community keep enhancing the level of understanding of each other in this process of learning. Initially, when the teachers came for their training, their views about air, water and sound pollution, global warming, tree planting and wild life preservation got formed as per what was taught in the class and as given in the book. After going through the curriculum, the teachers asked questions about the problems they faced, for instance, the village being far away, there being no wall around the school, non -availability of water, one period being too little for practical work, villagers not cooperating etc. In spite of all these difficulties, the teachers in most of the schools took the initiative to find alternatives. They entered into dialogue with the villagers while conducting routine teaching and practical work. This process of teaching helped them in being more creative. It also helped in creating interest in their job of teaching. Inspired by this, they have now donned the role of a motivator.

Shri Keshar Singh Mankoti, who was a teacher in the Junior High School, Artola, Almora, told us that

when he first went, none of the windows had shutters on them. He contacted the villagers, convened a meeting of the guardians and also started activities of growing flowers and getting the building repaired. He created and staged plays in the villages depicting the village history and showing the real reasons of wild animals straying into the villages. The village community was all praise for him and offered their full support. He found a simple way to explain the concept of the 'height above mean sea level', which was later included in the curriculum. Recognising his dedication to education, he was honoured with the President's award. Though retired, he still remains active in the village.

About 27 years back, Shri Narendra Kumar Bahuguna was teaching Environment Education in the Government Inter College Chhinka, District Chamoli, where he got an opportunity to take environmental education outside the school to the village. As a teacher and headmaster, he made the school a centre for environmental activities. On his call for participation, villagers from many villages used to flock to the school. With the participation of the community, he undertook a major tree planting operation in the villages of Malari and Gamshali located in the border areas. With the participation of the womenfolk he set up an example to plant thousands of trees in the school and also save many trees. After this he continued to remain active as Principal in GIC (Government Inter College) Langsi, Gairsain. Even as a headmaster he participated along with the students in the practical work in the villages. To meet the water scarcity problem of GIC Gairsain, he got a polythene water tank made. He has been motivating the teachers, headmasters and principals as District Inspector of schools. At present he is a Joint Director of Schools in Uttarakhand.

Sabendra Singh, a teacher in Varnigad, District Uttarkashi, says, 'Before joining the teacher's training, I wanted to do something creative, but did not find any opportunity for it. I could only participate in one or two cultural programmes in a year. After getting trained in the subject Hamari Dharti Hamara Jeevan, I got the vision and chance to become active. When people come to the school and praise my work, my self-confidence gets a great boost.'

Our traditional society holds quite a few sound social and moral values about education and natural resources. But there are also quite a few bad customs, evils and superstitions. Due to these it becomes difficult to find the real cause of the problems. Therefore, to examine the prevailing beliefs in a meaningful way and to encourage meaningful things while creating disbelief about the evils and superstitions also come within the purview of the education. A teacher is an integral part of the society. As he has himself been a part of the society through many generations, how could he remain untouched by the good and bad customs, virtues and evils prevailing in it? But wherever the teachers have applied a process of enquiry and investigation, their views and perceptions have changed. This new found confidence is a signal for change.

Shri Madan Singh Devli, a teacher in the higher secondary school at Petshal told us, 'Before teaching environmental education, like other folk, I also believed in superstitions and untouchability and attributed scarcity of water and drying up of water resources to some of these. Such ideas were firmly entrenched in my mind. I never gave it a thought or got a chance to check their veracity. I continued to carry a belief that if menstruating women or women who are in confinement take bath or draw water from a water source, the very act would cause the water flow to diminish or the source to get dried up. But during the process of teaching and experimenting with this subject I came to know the real reasons of water sources getting less or getting dry and all my previous perceptions got changed without my realizing it.'

Manual work has not been given any importance in our society. Education has further alienated it. Due to this the guardians have an opinion that education can be imparted only within the class and only through books. Finding the teachers and the students coming towards the village during the school hours, the villagers questioned the teachers why they were bringing the students to the village instead of engaging them in the class. Such questions gave the teachers an opportunity to engage in meaningful discussions with the villagers. A campaign for change had begun.

Those days, the school term used to begin in July, with examinations finishing in the first fortnight of

May, with the schools closed in June. I do not remember the day but it was in May. I was to visit an environment fair in Junior High School, Kama village. After crossing the fertile fields of Gagas valley I came to Kama village from where I walked uphill for about a kilometre to reach the school where the fair had started. A small ground of the school was fully packed with men, women and school children who had come from the nearby villages. A play was being enacted on the stage. It was based on the reading material of the 8th class depicting Mahila Mangal Dal of Tangsa village, with a theme involving usage, management and sharing of the benefits of the community resources. In this it was shown that how women of Tangsa Village came together to plant trees, protected its forests and reared milch cows in the common village land which had been completely eroded and had suffered massive landslides. At the time of drought they even distributed fodder to the other villages. The village community was deeply moved by this presentation.

After the play was over, some of the women came over to meet the headmaster. They asked the headmaster, who was himself a teacher of environment science, whether whatever was depicted in the play had really taken place. The headmaster confirmed it and asked them to meet him later to discuss it. After this incident I happened to visit this school again only after two years. After discussions in the class with the children, the teacher Shri Trilok Singh reminded me of my last visit when a few women, after watching the play about the Tangsa Mahila Mandal, had come to seek some information. These women were from the village Idasera which was adjacent to his village. He then narrated the story.

These women told him that Idasera has a flat and fertile land. For the purpose of irrigation an old traditional canal of village Kama was extended to Idasera Village. After some time there was a dispute. Consequently they were legally advised to take their turn to use it on alternate days. Idasera was a bigger village thereby the needs of a very few families only could be met by this arrangement, while Kama was a smaller village so most of the days of the month the water was being wasted. Due to this, Idasera residents were not interested in maintaining it. Next they wanted to know whether

what was done in Tangsa village could be done here also. He told them to go ahead and try it and also offered his assistance if needed.

After a few days of the environmental fair, the women of Idasera met and constituted a mahila mangal dal. They invited one person from each family for the maintenance and cleaning of the canal, decided the days for the maintenance work and made the village panchayat repair the canal. Next they collected Rs.10 per family and created a fund. In the meantime the mahila sinchai mandal took a significant step. They held a dialogue with the villagers of Kama who had the first and equal right over it. They requested the Kama villagers to use the canal to complete their irrigation needs first and allow the villagers of Idasera to use all the water for the remaining days. This was agreed to by the Kama villagers. Now the villagers of Kama use the water for 3-4 days and the Idasera villagers get to use it for the remaining days of the month. This has also helped in improving relations.

Joy of Learning outside the Class

Children always like to learn from outdoor activities, to observe their surroundings and draw a map of the village on the ground. They like to learn about the village history, know about the grass, wood, crops, land and water and also enjoy measuring the sources of water. They also like to connect whatever has been read in the book with their surroundings and to raise questions and find their answers together with the other children.

Students of the Pre -Secondary School, Chaikhan made a plan to collect seeds to prepare saplings of trees. Next day, the children of Singaroli brought the seeds, but the children of Lamkot reported that in their village they did not get any seeds from the banj trees. The process of sowing the seeds was begun using the seeds brought by the children of Singaroli. When the possibility of growing the seeds was being discussed, a girl from Lamkot asked, 'Why don't the banj trees of our village give seeds?'

Then one of the students pointed out that there were no seeds even on the trees surrounding the

school. All of them started to look for the reasons. The teacher took up the topic 'How do the plants and trees die?' in the class and made the students discuss the dangers of overcutting of the trees. A questionnaire was prepared for the children of Singaroli and Lamkot for them to interview their village elders about the history of the growth of the forest in their villages. Questions about the practices of fodder gathering were also included. Annual growth in the branches of the trees was also measured. Lessons and experiments were conducted on trees and their food. Investigations were carried out for a month with the help of the teachers and the villagers. It was found that if the tree branches are cut repeatedly exceeding the annual growth, further growth of the trees and grasses stops and they stop yielding seeds. Natural renewal also stops and in the long run, the trees and grasses die completely. A discussion was held to chalk out a plan to study the effect of rains in such places during the rainy season.

Shri Upadhyay, a teacher of Devalkhet Bageswar Junior High School told us that initially he was finding it difficult to teach the concept of altitude in the 6th class geography lesson. 'I was unable to figure out how to make the students grasp the concept of the altitude. Just after 3 days, I found a teacher of environmental science discussing the same concept with the students outside the class. Naturally I became curious. I found that the teacher had kept a large piece of stone in a wide vessel and had filled it up with water up to more than half its height. He explained the concept of treating the sea level as zero. Reckoning the level of water in the vessel as zero sea level and the stone as mountain/hill, he explained the altitudes of various places using scales. The next day I found that the students had fully grasped the concept of the altitude.'

Apart from this the teachers also shared their experiences of how they got helped in making the students understand many of the concepts in social sciences, science and mathematics.

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Diwan Nagarkoti is currently a member of Azim Premji Foundation, Almora and is part of the group working on Environmental Science. Prior to this he has worked as Research Associate in Giri Institute for development studies in Lucknow, where he undertook various researches related to social and environmental studies. He has also worked for eleven years in Uttarakhand Sewanidhi in the field of environmental education where he was involved in teachers' training, review of textbooks and on-site support to teachers. He has a Ph.D. in Agriculture Economics from Kumaon University. He has also written for the national daily, 'Hindustan' and was a visiting faculty at the Journalism department in Kumaon University, Almora. He may be contacted at diwan.singh@azimpremjifoundation.org



Creating a Society that Cares

Meenakshi Umesh



“We have not inherited the earth from our ancestors. We have borrowed it from our children”

Our Children

“Your children are not your children.

They are the sons and daughters of Life's longing for itself.

They come through you but not from you,

And though they are with you, yet they belong not to you.”—Kahlil Gibran

They are like flowers, each special in its own way. They are like mirrors, reflecting our thoughts and actions. They are like birds wanting to fly and explore the world. Children are learners from the minute of their birth. They are curious, intuitive, creative, inventive and a lot of other things. Unfortunately, their wings are soon clipped by the restrictions of our societal norms.

Children need time with themselves and with each other. They need to communicate with each other; they want to share and they want to do/explore on their own. In Maria Montessori's explanation of the role of work in the growth of self-reliance, she explains that children need time to simulate the world in their minds, and need concrete material to make abstract concepts comprehensible. Children should have the freedom to do constructive work on their own. The process and procedure of handling the material and completing the task inculcates self-discipline and responsibility towards the environment. Mahatma Gandhi dreamed of an educational system where children learn by doing different constructive work and derive learning, a feeling of accomplishment and satisfaction from doing the work.

Our attitudes and concerns are influenced by our education. In the contemporary educational system, children are driven to learning by studying

facts. They are pushed into nail-biting competition to be 'on top'. It is a fight for 'survival of the fittest'. There is no time for contemplation and reflection. And they fail to learn to take responsibility for their actions and the consequences thereof.

This kind of education not only estranges the children from Mother Earth, it also makes them insensitive about their connectivity and dependence on Nature. It removes them from the importance of life-values and empathy for other people. It leaves them distraught, helpless and self-centred. From the first day of school, they experience their first restriction in their freedom of movement in the confinement to the desk and chair. Energy, which is normally consumed by children in running around and laughing happily, is dammed up. The children feel frustrated and express it either through tears or by show of violence. Frustration is a common emotional response to opposition. Related to anger and disappointment, it arises from the perceived resistance to the fulfilment of the individual will. Frustration can result from blocking motivated behaviour. Each individual may react in a different way. He or she may respond with rational problem-solving methods to overcome the barrier. If unsuccessful, he or she can become frustrated and behave irrationally and aggressively.

There is an awareness of how the present educational system affects the personality of the children and through them, the society. The internally assimilated lessons from the present educational system contribute to the callous attitudes of the children towards other human beings, animals and trees. In the present educational system, there is place only for competition. This is an extension of the 'divide and rule' policy introduced by the British in India. Competition fosters jealousy, hatred, injustice, greed and carelessness. No wonder the attitude of

some of the youth today, especially in the cities where competition is more emphasised, is either suicidal or homicidal.

It is our responsibility as guardians of our children to review, re-examine and re-design the educational system itself and not just the content. We need an educational system that will help our children to become what they were meant to be for a society where co-operation, love and harmony will be fostered through care for the earth and all forms of life. There is only one earth and now is the time to care for it by re-designing our curriculum to inculcate caring.

Objectives of including woodcraft in the school curriculum

1. Natural learning process

To remove bookishness of knowledge and make the educational process at school also a continuum of their own natural learning process and life -



which means that the primary medium of acquiring knowledge is experience (through the five senses and a sixth sense: that of logic).

2. Non-violence

To create an educational process that has non-violence at its core. In conventional systems there is an extreme imbalance of information and experience which creates dissonance and leads to internal and external violence.

This curriculum is being evolved with the idea of nonviolence as both the process and the product.

3. Experiential learning



To create a learning environment which stimulates and facilitates experiential progression of knowledge in the child's mind.

4. Synthesis of knowledge

Creating an attitude among teachers and other stakeholders of the curriculum process, that the knowledge process is organic and naturally needing the learner to cultivate the ability to connect and synthesise pieces of information, and that this can be greatly enhanced by information, and that this can be greatly enhanced by making something with their own hands; learning is a continuous process and while crafting objects with their hands the children are able to relate to the concepts with an understanding of their connections with everyday life.

5. Autonomy / Self-reliance

Creating a learning environment and process that incorporates autonomy and self-reliance of each unit - be it teacher, child, a class, the school and so on.



This manifests in the curriculum process by necessitating the participation and ownership of both the teacher and the

child in the development of the curriculum itself thereby making it dynamic, evolving and responding to the situation at hand and a changing world and society.

6. Indigenous ways of knowing - Integrated / multidisciplinary

To acknowledge, validate and deepen dialogue with indigenous and traditional knowledge systems and ways of knowing. A key manifestation of this in the curriculum is the integrated and multidisciplinary approach to subjects.



7. Self-knowledge

Character building by sensitising the child to his / her own capabilities, strengths and weaknesses in a cooperative environment. Providing scope for children with less interest in academics to relate to the concepts in other ways and thereby inspire them to pay attention to academics.

As the children touch, feel and work with wood of different kinds, polishing, crafting and creating, an understanding of trees deeper than ever before, they will blossom as individuals, empathise with the environment and will help each other rather than compete with each other. They will learn to handle and care for simple tools improving their hand eye coordination, space organization and discipline. They will learn value of hard work, they will feel the contentment of creating something and their confidence and self-reliance will improve far beyond our imagination. The beautiful and useable articles they will create will make them see themselves in the work. Reflection, diligence and pursuit of perfection will become second nature to them. Something will begin to work up on their body and soul and they will grow up to be graceful, honest, creative, hardworking and content.

As Herbert Read says, ‘A child’s art work is its passport to freedom, to the full fruition of all its gifts and talents, to its true and stable happiness in adult life. Art and craft work leads the child out of itself. It may begin as a lonely individual activity, as self-absorbed scribbling of a baby on a piece of paper. But the child scribbles in order to communicate its inner world to a sympathetic spectator.’

Rabindranath Tagore wrote: ‘If educational processes are created to aim for the unity of the whole humankind, the beginnings of this are in the growth of love of the baby for the mother, for the immediate family and ultimately to universal love. But the foundations of this unity are laid in creativity.’

WOOD WORK CRAFT AND ITS ROLE IN CONTEMPORARY EDUCATION

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
RHYTHM 5 minutes	Start by a rhythm using claps and stamps and the affirmation WHAT I DO, I DO WELL. Stand in a circle, clap for each word first time, when said second time clap for the first 5 words and stamp for 1, then clap for 4 stamp for 2, and so on till clap for 1 and stamp for 5 and next stamp for all words. Reverse the process.	More complicated rhythm of walking forward saying I TREAD MY PATH WITH COURAGE AND STRENGTH. First walk all 8 steps forward one step for each word. Then walk 7 forward and 1 back ward and then 6 forward and 2 backward till you walk all backward. Then reverse the process.	Stand on the toes and say one sentence at a time. 3 times I AM STRONG, I AM STRENGTH. I AM HEALTHY, I AM HEALTH. I AM WEALTHY, I AM WEALTH. I DO NOT WORRY. I DO NOT ANGER. I DO MY WORK HONESTLY. I SHOW LOVE AND RESPECT FOR ALL LIVING AND NONLIVING THINGS. I AM THANKFULL FOR EVERYTHING. I ALWAYS KEEP A SMILE ON MY FACE. I AM HAPPY, I AM HAPPINESS.	Value - cooperation, concentration, positive thought & action. Process - claps and stamps, discipline. Work - clean the space and organise into a circle, include all children. Justice - alternately placed boys and girls. Art - sequence and rhythm. Adaptivity - can be done in any language and any positive sentence can be used. Academic - language, pronunciation, counting, balance.

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
<p>DISCUSSION</p> <p>Teacher directs the discussion by asking pointed questions</p>	<p>What objects in their surrounding are made of wood: (tables, chairs etc., paper, pencils, writing pads desks, black boards, notice boards, doors, windows, roof etc) Why these things are made of wood? Which other materials can be used as replacement? Where do we get our food from? Who eats what? Properties of wood related to density float or sink experiment with dry and green wood. Other functions: purifying the air, shade, home for other creatures, first step in the food chain etc.</p>	<p>The same discussion will yield different conversations and the children will learn from one another. There will be knowledge base visible within the class and the children find it easier to learn from peers. Add further discussions about the Conductivity properties of wood. Wood as a renewable energy Other functions of trees: creating a habitat for other life forms, the reasons for the need for bio-diversity.</p>	<p>More discussion on processed wood and the advantages of being creative and using waste wood. Other aspects of wood as in fossil energy and fuel briquettes.</p>	<p>Learning to listen to others and respect their point of view. Expressing their own thoughts without inhibition and learning to take criticism positively and learn from ones mistakes. Learning to analyse, reflect and use logic to arrive at certain conclusions after observation. Co-operation, consideration of others, self-discipline, self-evaluation, self-validation.</p>
<p>CONCEPT to be touched on</p>	<p>Learn to notice different materials, their uses, properties and possibilities. List other materials and their sources- aluminium, iron, Copper, steel, cloth, brass, List objects made from each material in their surroundings. Understand that materials are processed before they can be used, Draw attention to the fact that earth is the only source of all the raw material.</p>	<p>Draw attention to the objects and ask which material they are made from. Eg; vessels, shelves, furniture, mats, clothes, houses, tools, electric wires etc Why are they made from that materials only and not others , what are the criteria to be considered before using raw materials to make something.</p>	<p>Discuss what has happened due to indiscriminate ways of using material. How traditional materials have been replaced by non-degradable plastics. Discuss the possibility of wood as a renewable resource without depleting forests. Talk about Agro forestry and other processed substitutes of wood like plywood, particle board, hard board and new wood. Protection of wood. effects like warping, splitting, bending, termite attacks, borers etc.</p>	<p>Establishing linkages, understanding the need for reduction of waste, reuse of material and enhancing product quality for longevity instead of the present trend of use and throw products.</p>

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
STORY TELLING	Make up a story about what would happen if trees were to have feelings and talk and inform us about their needs. Their need for water, sunlight, air and a friend who would care for them.	Show animated movies like THE LORAX which is about a city where there were no trees and how it came to be that way and how one boy decides to bring trees back.	Tell the story of the chipko movement to save trees. The modern Chipko movement started in the early 1970s in the Garhwal Himalayas of Uttarakhand, by Shri Bahuguna, then in Uttar Pradesh with growing awareness of rapid deforestation.	Understanding the importance of trees. Learning what makes up the tree- carbon cycle. Sympathy and empathy for the plant world.
FIELD VISIT: To a nearby garden/ forest/ woods/ avenue of trees. ACTIVITIES	Collection of leaves, flowers, seeds (After talking to the plant and asking for its permission and thanking it with a hug or kiss) Bark rubbings, leaf impressions using crayons. Drawing anything they like- life sketches.	And observing different types of vegetation and different layers of plant life in the wild. Drawing leaves as they see them, root systems of small plants, flowers and their parts.	And silent meditation. Drawing parts of the plant, flower or tree and then drawing the whole tree as a form as seen from far.	To enrich the child emotionally with wonder at how everything is created. To cultivate reverence for the environment and mother earth.
CONCEPTS INTRODUCED	Uses of plants, Names of parts of the plant and their function. Names of vegetables and fruits. Names of spices used for cooking. Names of simple and everyday medicinal plants and their uses (children should talk to their parents and give feedback) Learning to see difference between types of leaves, types of seeds, types of roots.	Function of plants and trees- Bio diversity. Needs of plants- How they fulfil them- the wonder of how the whole living world is made from a component of air CO ₂ . How plants are the first step in the food chain. Try to identify by looking at the leaves of a germinated seed if it is a monocot or dicot.	Climatic regions of the world- Deserts, Grasslands, Tropical forests, Ever green forests. How flora depends on climatic conditions and fauna depends on flora. Degradation of forests – reasons for the same. Plantations for timbre rather than using up forests - agro forestry	To emphasise empathy with the other living beings. To bring to the child the power of his or her own observation to generate information rather than collect information from books. Self-reliance, aggregation and integration of knowledge as against segregation when learning subjects.

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
<p>ACTIVITIES based on field visit in class room</p>	<p>Sorting of the material collected- size wise, colour wise, texture wise, and quantity wise. Counting of the different classifications. Painting impressions of colour as it comes to mind. Drawing and expressing the uses of the tree to us and other living things around us. Colouring with crayons.</p>	<p>And identifying with the help of peers, parents and teachers the different plants collected. Listing their uses and making a class herbarium. Making a table with the various types of plants and their uses and attempt to identify the timber varieties. Writing a poem about one preferred tree or plant. Writing about the experience of the visit, what they saw etc.</p>	<p>And writing with more feeling component. Can decide to make a comic strip about the visit to the forest. Understanding structure from the way the trees are, the way the branches go out and the balance of the tree. Drawing first a leaf, then a branch and then the whole form of the tree observing the way the leaves are placed and the way the branches are organised with focus on stability of the tree or plant.</p>	<p>Learning classification, counting using leaves and seeds. Learning to represent thoughts in pictures. Learning classification of trees and plants, the botanical name, common name, reason for the need of botanical naming systems, uses of the plants. Learning to make tables to classify information to make it easily accessible. Language skill development, expression of thoughts in words. Creativity in use of the language to write poems. Learning to see and draw objects as they are without using the mind for interpretation. Improves observation skills. Understanding the basics of geometry, form and stability.</p>

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
COMPETENCIES	<p>Classification by size, colour, texture etc, Counting, using tens to count large quantities, Observing differences between leaves and flowers to identify the differences. Use different leaves, sticks and stones to make collages.</p>	<p>Different layers in a forest. Types of plants- grasses, herbs, shrubs, trees, epiphytes, parasites. Make a table of the types of trees against their uses like fuel, timber, medicine, food and fruit, habitat makers (banyan tree) etc. Needs of plants and trees and how they fulfil these needs themselves.</p>	<p>Bio diversity of plant and animal life. Function of plants in the ecosystem. Interdependence and symbiotic relationships. Source of energy synthesis and therefore basis of all life on earth. Concepts of angles, how acute angles occur in nature, triangle the strongest form. etc.</p>	<p>Learning to identify trees and shrubs looking at the form and remember their uses as medicine. Understanding the need for bio-diversity in nature and relating it to the health of the ecosystem. Thankfulness to nature. Learning about balance, root systems, branching patterns and leaf and flower and seed designs for the facilitation of pollination and dispersion. Observation skills, Drawing ability, self-expression, names of colours.</p>
DEMONSTRATION	<p>Children observe the carpenter working.</p>	<p>The children find a person who does good woodwork and request him to come to the school and make something for them. In the process they talk to people and locate the carpenter.</p>	<p>All the children observe the carpenter working and interact with him or her and ask him or her anything that interests them. Try to find about how he/she learnt the craft and how they are doing financially.</p>	<p>Learning the uses of the various tools by watching the carpenter work. Understanding the need for promotion of traditional crafts. Develop aesthetic sense and creativity.</p>

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
<p>FIELD VISIT: To visit the local saw mill with carpenter</p>	<p>Not needed for this age group</p>	<p>Observing the tree rings and how age of trees is obtained from them.</p>	<p>Types of timber and their origin. Costs per unit - learn unit of measuring wood.</p>	<p>Learning about the effect of seasons on plants and how the trees record time. Annual, biennial and perennial plants.</p>
<p>CONCEPTS</p>		<p>Unit of measurement of length and cost of timber. What can be made with waste of saw mill cutting, from saw dust? Curing of wood, Treatment of wood. Bamboo as a special wood. The tensile strength of bamboo makes it very versatile. Almost replaces steel if it can be kept safe from borers and termites.</p>	<p>Export and import of wood, Its cost and availability implications. Locally available timber varieties and their specific uses. Effects of deforestation on soil and animal population. Its implications for farming- conflict between man and wild life.</p>	<p>Calculation in square feet and cubic feet. Concept of volume and how it is measured. Learn about volumes and how they are calculated for different solid shapes. Cutting wood with minimum waste using concepts of LCM AND HCF. Connecting the phases of the moon with growth of plants and movement of sap in the plants. Harvesting of Bamboo was traditionally done during new moon days because the sap is low and therefore less chance of insect attack.</p>

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
ACTIVITY making wooden objects	Using a set of prepared material incorporating working with real screws, wooden nails and real nuts and bolts, screw drivers, wooden hammers etc Take a piece of wood or a coconut shell and sand paper it till smooth and make cups or ladles with them.	Making a simple toy using simple tools like small hatchets, hammers, hack saws, etc Make objects like A TOP, A BAT, A GILLI DANDA, A DRAG TOY etc.	THREE Objects; First: of their choice. Second: A utility object like a shoe stand, magazine stand, small stool etc. Third: A Utility object with aesthetic value. Pen stand, picture frame.	Feeling of competence, satisfaction and contentment. Learning about one's ability and limitations, patience and perseverance. Learning to appreciate steadiness of hand and unite it with the creativity of the heart by working out the problems using the mind.
COMPETENCIES and CONCEPTS	Understanding the need for silence when such tasks are performed. Types of joints possible. Observation of shapes, size and compatibility. Measuring using non-standard tools of measurement. Hand eye co-ordination, co-operation, Creative thinking	Add concepts according to objects made (if a top – spinning movement SO: talk about types of movement gilli danda, bat ball, only ball, drag toy, trajectory movement, movement in straight line, spinning motion, rhythmic or oscillatory movement and Cyclic movement. Which things spin or rotate: Earth, concept of axis, day and night on earth is an effect of the spinning movement of the earth. Seasons are the effect of Cyclic movement.	Concepts: of Force and how it makes work happen. Of friction and how movement is stopped. Of momentum and how we get thrown out of our seat when the bus stops suddenly. Relative movement; things seeming to go in the opposite direction when we travel in one direction. How the moon seems to be following us where ever we go and however fast we go; to make toys those go round making noises of different kinds (lots in Arvind Gupta's book).	Skills: Drawing of the top view of the object, side view of the object, deciding the size, material to be used – type of wood or processed wood. Procuring material; Costing of the material and labour and deciding value of the object. Justifying the labour value (self-esteem) How to handle and keep tools systematically. More concepts: take a small plastic bottle, cut it, fill it half with water, tie a string around it and spin it ... observe that the water does not fall down from the bottle. Explore centripetal force and centrifugal force in the throwing of a

Activity	Age group/ class 5-8 YEARS	Age group/ class 8-11 YEARS	Age group/ class 11-14 YEARS	Dispositions cultivated
				top and its spinning too! Spinning wheel, takli work , make a colour disk.
DISCUSSION and THEATRE	Discussion on what are traditional crafts, how they are dying out: Using the theme of dying out of traditional crafts write a story collectively For the three age groups according to the ability and understanding of the children and then convert it into a play. Facilitator helps with script writing and the drama is performed before the whole school.			Language ability, confidence, collective creativity etc.

Born and brought up in Mumbai, Meenakshi has a degree in Architecture from Sir J.J. College of Architecture. She has worked with low-cost, eco-friendly construction technologies at Auroville, near Pondicherry. For several years, she, along with her partner, Umesh, has practiced various alternatives in farming, construction and education in a drought-prone area of Dharmapuri District in Tamil Nadu. In 2000, they started a school based on the ideologies of Rabindranath Tagore, Mahatma Gandhi and E.F. Schumacher using methods demonstrated by Maria Montessori, David Horsburgh, Rudolf Steiner and Janet and Glen Doman. They now run the Puvudham Rural Development Trust, that works on developing effective organic farming techniques and providing a humane and child-centered education environment for children in the Nagarkoodal area of Dharmapuri, Tamil Nadu, India. For more details, visit www.puvudham.org. She may be contacted at puvudham@gmail.com



Learning Life-long

Prema Rangachary



"By education, I mean an all-round drawing of the best in child and man in body, mind and spirit"
- Mahatma Gandhi

The government's flagship programme for universal elementary education across the country, Sarva Shiksha Abhiyan, has been implemented in 13 districts of Tamilnadu. Its child-centred activity-based learning has expanded the reach and improved the quality of elementary education. A similar programme, based on the principles of constructivism and self-directed learning, has been introduced for the middle school.

However, the government's approach is always top-down and does not always take into account the needs of the children or the community they come from.

But does the bottom-up approach work? Yes it does, as a study of the pedagogy of Vidya Vanam, which serves the children of the Irula community in Anaikatti district of Coimbatore, reveals. This approach integrates learning into the greater ecosystem of the community.

The primary purpose of schooling is to allow the individual to learn attitudes and skills that allow him/her to interact with the environment successfully. A tribal person's life is totally connected to his/her environment; therefore, we needed a pedagogy of teaching that was sensitive to their cultural needs, an awareness of the traditions and learning styles of different children.

Problems of learning arise when the child's environment and cultural context are not the same as that of the teacher. Usually the teacher-training programmes are a uniform package, used across urban and rural settings without any change. So pedagogy should be seen not merely as a scientific tool for instruction but also as a cultural matrix into

which learning is woven and should address different cultural contexts, learning and teaching behaviours, both inside and outside the classroom.

Education is both an organic and a human system; it is about people. Human beings are naturally different and diverse and prosper in a broad curriculum that celebrates that diversity and recognizes various talents. A curriculum that emphasizes maths and science and also gives ample scope for artistic expression provides for diverse learning styles. So the curriculum has to rethink existing methodology and create new systems that encompass the head, heart and hand.

In the early years of school, the primary focus is to build self-confidence and self-learning skills. Subject distinctions do not necessarily make sense to the children. Meaningful learning comes with the ability to understand knowledge as an interconnected pattern seamlessly flowing from one to another to make a cohesive whole. To address this need, Vidya Vanam developed 'theme-based learning'.

Theme-based learning

This involves selecting a theme that can be explored at different levels of the child's development. Children are divided into small groups and assigned to work in groups. The theme is the overarching umbrella under which different subjects are studied and seamlessly connected with each other. It also runs through different levels of learning and is extrapolated to challenge every group. This process goes a long way in reaffirming that knowledge exists as a whole and not as individual, isolated pockets. This also deepens the awareness of the ecosystem and the cultural ethos of which they are a part.

Theme-based units help teach a range of skills and content by integrating curriculum areas around a topic. This capitalizes on children's interests and

creates a sense of purpose and community in the classroom. Inquiry and communication are activated by a desire to know more, resulting in enthusiastic participation. This integrated studies approach, based on collaboration with the learners, is a new organizational model for some teachers. It can be threatening to those accustomed to a more traditional model, because the teacher no longer has control over the curriculum content. The teacher becomes a participant in the learning process.

The teacher thus becomes a coordinator or facilitator. Many teachers have lesson plans but remain flexible and allow students' interests to lead the unit in unexpected directions. Though this gives students a greater voice in the topics they study and the strategies they use, the teacher's role is not diminished. Young people still need teachers to help them reflect on their learning and to make connections between what they knew and what they have just learned. The acquisition of skills needs to be planned and the possibilities for applying them in other situations needs to be illustrated.

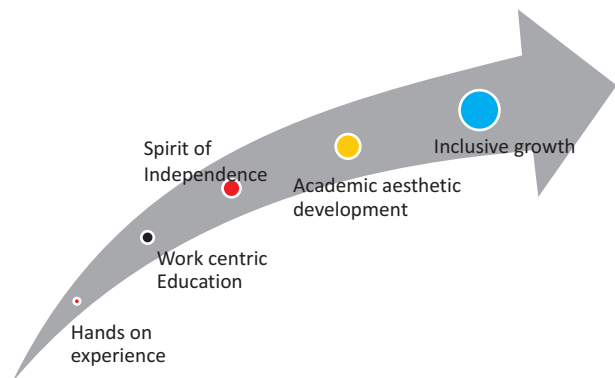
An excellent strategy for teachers is to plan thematic units with a colleague. Sharing ideas, reflecting on activities, developing resources, planning activities affirms the skills of both teachers and provides an opportunity to build on each other's expertise to create something that neither would have accomplished alone.

Vidya Vanam plans school-wide theme studies for multi-age groups created by combining the student population in ways different from the usual grade/class. The structure and duration vary according to the resources available and the objectives. One advantage is that teachers benefit from the interchange of ideas when they work collaboratively. Also, the sense of the school as a community is enhanced when teachers and students from different classes become acquainted and when students work with others of different ages.

There are also the advantages of theme studies being developed by teachers and students together. The students bring innovative ideas, resources and strategies and become committed to the learning

process that is driven by their own interests. Learning becomes more meaningful when learners choose their methods and topics of study; the model of lifelong learning is brought into the school setting. Interpersonal relationships between teachers and students are improved when authority is put aside, and teachers become collaborators and mentors rather than lecturers.

Of course, the teacher retains ultimate control over behaviour and is accountable for ensuring that students are engaged in worthwhile projects that extend skills and result in increased knowledge and positive attitudes. The movement toward student-directed learning is not a movement away from responsibility; instead this responsibility is shared with students.



1. Choose a theme

The first task is to discuss and define a theme that will form the basis of a unit of study. Goal(s) pertaining to the theme (i.e. not specific to curriculum areas) should be agreed upon by the planning team as a whole.

2. Plan ahead

Develop a realistic plan around the chosen theme. Decide who will plan specific curriculum areas, and set a date for completing the plans. Plan the entire unit together and ensure that specific objectives are met. Tasks that should be completed before you begin teaching include:

- Set objectives (for curriculum areas)
- Determine evaluation strategies
- Divide planning responsibilities
- Set deadlines for completion of planning
- Gather/locate resources

- Plan activities: an introductory activity, activities for the whole class, some for small groups, others for individual projects or assignments, and a final activity at the end
- Reach out to the community for assistance
- Map the entire unit using weekly planning templates

3. Put the plan into action

Introduce theme. You will need to be flexible, as student ideas and interests may take you in unexpected directions. Continue to meet with the planning team for inspiration and support as the unit progresses, and adjust the plan according to the situation.

4. Evaluate

Evaluate the students' progress with tools that reflect the objectives in Step 2. When you have completed the activities, evaluate the success of the unit, share information with other classes, parents, and community groups and celebrate your accomplishments.

Example

Theme: Soil

Children love to play with soil and the immediacy of it makes it an interesting subject. The theme lends itself to a detailed study of science, social sciences, math and languages.

We began with the symbol of the pot. Pottery was one work outcome of the study of the theme. A pot is also the symbol of the five elements: Earth is mixed with water to make the clay fired in the kiln (fire) and encompasses air and sustained in space.

We then proceeded to studying the creatures in soil, moved on to the plant and animal kingdom which includes the human being. The full circle connected with ecology, environment and pollution, leading back to soil.

Interdisciplinary approach



Science: Characteristics of soil (colour, texture), nutrients and fertility, process of soil formation, factors responsible for different kinds of soil like climate, rainfall, water etc.

Mathematics: shapes, area and perimeters, fractions via proportion of nutrients, measurements like volume and weight.

Social science: ecosystems, vegetation and wildlife, major landforms, environmental conservation, atmosphere, topography, archaeology

Fine Arts: painting, pottery, modelling, murals, sculpture

Language: stories, literature, essay, poems, slogans, debates

Theme-based learning helps children to make more sense of their lived reality and apply acquired scientific knowledge. This pedagogical concept tests the teachers' resolve, application and resourcefulness. It requires sensitive teachers who also need to educate parents and the community about the desirability of this enlightened and democratic teaching-learning process.

Prema Rangachary is principal advisor to Vidya Vanam, a school for tribal and under privileged children in Anaikatti, Tamil Nadu, run by the Bhuvana Foundation. She may be contacted at premarangachary@yahoo.co.in



Exploring Energy in our Daily Life - Unearthing Connections

Radha Gopalan



When we think of energy and energy conservation more often than not we think mainly of electricity. This is largely a function of the innumerable appliances and gadgets that – consciously or unconsciously – help us get through a typical day in our lives. We become conscious of energy only when there is a power cut in summer or we see an increase in the electricity bill at the end of the month or we run out of cooking gas! There is also a disconnect in the way we relate to energy. In our private and public spaces we rarely ask the questions - what forms of energy do we use? Where does it come from? How are lights and fans (and sometimes even air conditioning), in many urban homes, housing complexes, offices and shopping malls, available 24x7 even when there is a power crisis in the State and country? How is energy consumption related to what we choose to eat? How we go to work or for a holiday?, etc. However at school, work, in a social setting, in conferences and seminars, we often have discussions on the crises caused by global warming and climate change, the need for renewable energy technologies, using mass transport versus driving a car etc. Often we seem to have these discussions without drawing the connections between personal consumption patterns and the larger issues of energy such as its impact on the surrounding environment and its contribution to one of the most profound phenomenon facing the planet – climate change. It somehow seems to be a problem that is out there – a function of poor Government policies, corruption, overconsumption by “the rich”, a problem created by developed countries etc.

This article explores some simple ways by which the school space can be used to try and reduce this disconnect. The article is based on my experience with urban students in a residential school located in a rural setting – the Rishi Valley Education Centre

(RVEC). This is an 80 year old institution that resides in a semi-arid ecosystem in the Rayalseema Region of Andhra Pradesh. The nearest town, Madanapalle, is approximately 20 kms away. Our neighbours are small farmers and pastoralists whose livelihoods are dependent on a fragile ecosystem that receives very little rainfall ranging from about 55-75 cms annually. Electricity is erratic with 6-8 hours of no grid power in peak summer. Energy and water are thus scarce and precious.

Understanding energy in the school space

Like in most schools, understanding the various theoretical concepts related to energy is typically done as part of science curriculum. Applications of energy and its relationship with the environment is through Environmental Studies. Energy is often a favourite theme in projects that students carry out as part of their curricular requirement in Science and Environmental Studies.

At the Rishi Valley Education Centre (RVEC), students explore various aspects of energy through readings, projects and hands-on activities in Science, Environmental Studies and as part of the General Studies course in Class XI. Exploring renewable energy technologies through projects is a particular favourite among both students and teachers.

Understanding concepts of renewable energy and their importance from an ecological and economic context for the present and future is very important. However to make an informed choice of the most appropriate technology(ies) to be used at a given location it is important to understand the quantity and quality of energy consumed and energy usage patterns. A simple tool that can help generate this information is the energy audit¹. The information from the audit can be pictorially

¹An energy audit is a tool that is used to (i) systematically document the various sources and quantities of energy used, practices adopted for energy usage and measurement, and (ii) periodically review and evaluate energy usage.

represented through eco- maps² to understand energy consumption patterns. Students of Environmental Studies at RVEC use this tool extensively for projects. Some students have also explored energy usage patterns in the neighbourhood (comprised of small farmer and pastoralist households) through household surveys and interviews. Comparing this information with energy consumption patterns on campus revealed the differences in urban and rural energy usage patterns.

Both audits and eco-maps are simple tools that are versatile and can be used anywhere by anybody. All it needs is a pencil, paper and planning! Every time these activities have been carried out, students and adults have been surprised at how all-pervasive energy is in our lives and yet how little we think about it.

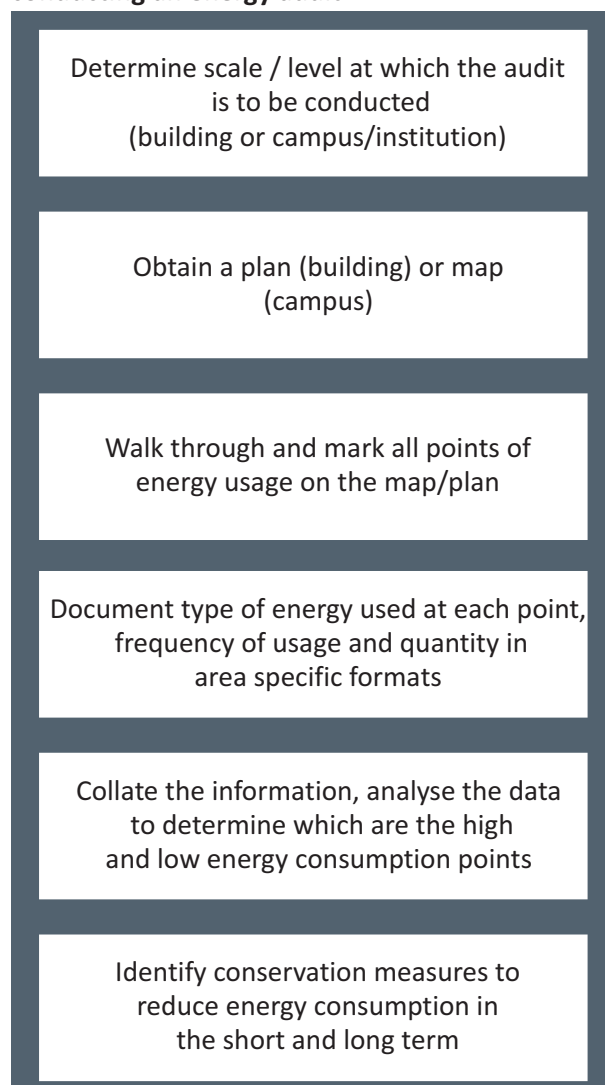
This article will focus on how the energy audit can be used not only as a tool to understand energy consumption and develop energy conservation measures but also stimulate a larger discussion on energy.

Energy audits – some experiences

The first step in conducting an energy audit is to decide the scale – will it be a house or building or will it be conducted for a campus or institution. To do this one needs to find out the various points of energy usage, types of energy used, frequency of usage, compute the quantity used, and determine the efficiency of energy use. There are several excellent resources available on how to carry out such an audit³. What is important however is to first articulate the reason for the audit – is it only to know how much energy is being used, where energy is being used, in what forms? Or is it a means to reduce energy consumption or put in place a programme to conserve energy? For example, students have carried out energy audits of their homes or the buildings in which they live to understand the amount of energy used. At the RVEC campus, a group of students and some interested teachers wanted to increase energy conservation efforts on campus and thus used the energy audit as a tool to collect quantitative data on energy usage.

The broad approach that was followed is outlined in Figure 1. While it is ideal to carry out follow up audits annually, the frequency with which audits may be conducted is a function of how long it takes to implement conservation measures identified in the previous audit. The follow up audit is typically done to assess how effective the conservation measures have been in reducing energy consumption.

Figure 1: Step-by-Step approach to conducting an energy audit



To share the findings of such an audit a map of the school or plan of a home can be used and areas of high and low energy consumption can be colour coded and displayed effectively. For example red to

²An eco-map for energy is a pictorial representation of energy usage at a given location. It could be created for a house or for a community.

³The Green Schools Programme. A Manual to Assess the Environmental Performance of the Community. Centre for Science and Environment. New Delhi. 2011. This is a step-by-step guide for energy, water and waste audits.

show areas of high energy consumption and green to indicate low energy consumption or efficient energy usage points (say CFL lamps replaced incandescent lamps).

The school energy audit carried out by students and teachers provided both direct and indirect learnings. Some of the direct learnings include:

- appreciating the importance of accurately measuring energy consumption. Very early in the audit it became clear that some of the electricity meters were not accurate and hence the data was not reliable. Thus the need for good quality electricity meters at various locations to measure the amount of electricity consumed on campus emerged as a priority action item - what we cannot measure we cannot conserve;
- becoming aware that energy is consumed in various forms e.g., electricity for home classroom and street lighting, to run computers, for cooking, laundry and pumping groundwater for daily use on campus etc. LPG is used for cooking, fuelwood for heating water, solar energy for heating water and lighting the campus at some locations and diesel for transportation of people, produce, and other goods and services needed at the school;
- finding out that it takes three diesel generators to ensure 24 hours uninterrupted power supply on campus, given the erratic grid supply. This helped understand how much and how frequently diesel was consumed for the generators;
- that there are more than 20 inverters on campus to keep the computers operational through the working hours which means somebody has to maintain them and that at the end of their lifetime they have to be replaced. What also became clear was that there is potential for hazardous waste generation since the inverter has acid batteries;
- that the office administrator optimises the transportation from school to the nearest town to conserve fuel;
- understanding that increasing efficiency in transmission of energy and in its use is critical in enabling energy conservation. To ensure efficient energy usage, electrical infrastructure (including wiring) must be periodically reviewed to minimise transmission losses. Efficiency of all electrical appliances e.g., laundry washing machines, large kitchen ovens, the kinds of lighting devices used,

must be regularly checked through a preventive maintenance programme.

Some of the findings of the audit led to direct action. For example installation of new electric meters particularly at points of high power consumption on campus so that accurate data can be obtained based on which more detailed studies can be done to reduce energy consumption. It also led to the creation of a preventive maintenance inspection checklist for equipment used in public areas like the solar water heaters, laundry washing machines etc. Students used this checklist to inspect the devices once a term and provided the report to the maintenance crew on campus for action where necessary.

Another outcome of this audit was that building level energy usage information (both quantity and frequency) was made available for the first time. This was useful for the campus site engineer and the maintenance staff to identify peak electricity loads. The information on peak loads in turn was used in estimation of energy requirement and distribution on campus when RVEC decided to build a solar power plant. The applications of an audit are, thus, manifold.

Going beyond the audit

The information generated by the audit lends itself to many extensions – starting from the individual and extending to the larger community. Personal consumption practices get highlighted – one suddenly realises how many appliances one uses in daily life. It could range from battery powered and electric toothbrushes, blenders for juices, soups and chutneys, to motors and pumps to bring water to taps, inverters to run computers and so on. This could be used to develop a personal energy conservation plan.

In towns and cities the use of energy to cool offices and homes is a significant issue. The information on heating and cooling homes and offices can be used to discuss issues around urban planning and relevant architecture. For example, poor urban planning, lack of adequate green cover and building with glass, steel and concrete has led to our cities and towns becoming ‘heat islands’. We then need air conditioning to cool them, leading to greater demands for energy. Students could then be asked to question why concrete-glass buildings are inappropriate for a country like India. This could

then lead to small projects on alternative architectural forms such as vernacular architecture and using local materials which are more energy efficient.

Tracing the source of energy is another interesting activity that students can take up from the audit. Where is the electricity coming from? Is it hydro, thermal or some other form e.g., solar, wind etc. How far is the generation point? Electricity Department officials could be interviewed to understand more about some of these issues. Where is the fuel for the vehicles used coming from? Where is the nearest fuel station? What is the cost of fuel? What percentage of energy comes from various sources at the State and National level? and several other questions can be explored to understand the energy situation both locally and nationally.

This activity can be the basis for discussions on conservation measures – reducing the number of appliances, increasing energy efficiency through better appliances (where needed), better wiring to reduce transmission losses, optimising fuel usage

during transportation through use of public transport etc.

The fact that energy is needed to draw water for drinking and other uses and to grow food can trigger discussions on the interconnectedness of everything around us – reinforcing the point that conserving water means conserving energy as well, and reducing food wastage means conserving water and energy. Understanding fuel consumption in transporting food can bring about discussions on the need to eat more locally and seasonally. The idea of embedded energy in food produced using petrochemical based fertilisers and pesticides can be introduced. The idea that fossil fuels are needed to produce these chemicals and therefore the need for sustainable agriculture can also be discussed.

What starts off as an accounting and measuring activity can be expanded to understand and show how our actions are inextricably linked to what happens to our resources and how energy is at the heart of it all. The versatility of this simple tool depends on the imagination of the learner – teacher or student.

Table 1: Sample formats used in the RVEC energy audit

A. Household electrical equipment data sheet

Water heater - How do you heat water in your home? What is the length of operation and frequency of use?

Appliance	Capacity	Length of operation (minutes)				Frequency of use		
		15	30	60	Any other	Once a day	Twice a day	Any other
Geyser								
Gas-based heater								
Immersion rod								
Wood fired boiler								
LPG stove								
Any other								

B. Lighting and fan

Facilities

Device	Quantity	Model	Frequency of use [#]	Duration of operation ^{**}
Tubelights				
CFL				
LED Lights				
Fans				
Coolers				

^{**}State the timings when these devices are turned on e.g. Lights 7:00 pm to 10:00 pm etc.

[#]Seasonal usage pattern e.g. Coolers /fans in summer etc.

Similar formats were prepared for other activities like washing, cooking, agriculture, etc.

Radha is an Environmental Scientist with a doctoral degree in Environmental Science and Engineering from the IIT Mumbai in India. After a 15 year long career in Environmental Consulting Radha moved to Rishi Valley where she teaches Environmental Science to high school students at the Rishi Valley Education Centre (RVEC). At RVEC, Radha works with small farmers and pastoralists in the surrounding neighbourhood to enable livelihoods to become more sustainable. Radha has had a long abiding interest in food security and education which she is now using as the basis of the work that she is engaged in with the community of small and marginal farmers who form the rural community in which the RVEC is located. Radha has been with the RVEC for close to 6 years now and is working at developing a livelihood framework based on her experience and practice in the field. She may be contacted at radha.gopalan@gmail.com



Education through Work (Mushroom Production) and Its Relation to Other Subjects

Sahabuddin Ansari



"Skills are needed to succeed in today's world" - Cyrus Vakil, Chairman, Examination Reform System

Dineshpur is a small nyay panchayat in Udham Singh Nagar district with a large Bengali population. The Azim Premji School, where RtE is implemented, was established here in 2012.

When the school was started, the teachers went around the entire area and provided information to the community about the school. During our rounds, we found that the majority of the population are labourers, some of whom are employed with SIDCUL, women and children roll beedis in their homes, others work in fields or sell vegetables. Our school children also worked somewhere or the other, like in motor garages and meat shops. Some grew vegetables and assisted their parents in the weekly fair on Saturdays. The parents of these children aren't very educated.

I have 8-10 years of experience in running my food factory and cultivating mushrooms. Once, in a discussion with the headmaster of the school, I told him a little about myself. The headmaster suggested that I conduct some activity which will help the children learn something new along with their studies. He talked about Nai Taleem (New Education) and work in education. I came up with the idea of the project where we could grow mushrooms. I told my colleagues also about it. Everybody gave me their suggestions, and we had detailed discussions. When we told the children about the project, they enthusiastically came forward to work on it.

Gandhiji and Nai Taleem (New Education)

Gandhiji laid the foundation for Nai Taleem. He believed that since the majority of people live in villages, children's education should be such that whatever they learn in the classroom has to be of

practical use to them in their lives. He advocated a handicraft-centred education. He said that he didn't imply that education has to be only for job-training. He wanted to teach students all kinds of things through work. His strategy was to incorporate history, geography, mathematics, science, language, art and music into it. His opinion was that education should not be just bookish knowledge, but should encompass the activities of daily life, and should be derived through work and activities.

He also felt that diligent hard work and labour must be made an integral part of life. Visually, only observation and testing must be done. When there is hard labour with our own hands, and when we are involved in experimental activities that are beneficial to the society, only then will there be true development of the mind and heart.

NCF 2005 - National Curriculum Framework

NCF 2005 deals with imparting education to children based on working with one's hands with the intention that every citizen can contribute to the economy of the country.

The National Focus Group believes that:

- Handicraft should not be taught as a separate subject, but must be taught in connection with subjects like History, Social and Environmental Science, Geography, Art and Economics, because it is an inseparable part of India's culture, beauty and economy.
- No matter what subject or profession a child chooses, the experience he has gained by the medium of craft will help him in the process of learning. Working with our hands, objects and techniques will help us understand the processes.
- In rural areas, handicraft should have different curriculum so that the practices that are already present in these places, like business, technical education, language skills, accountancy,

marketing and packaging can be developed even further. In urban schools, craft can be given as optional experience and for creative construction.

But why opt for mushroom farming? In Class 6, 25 out of 29 children have parents who are daily-wage labourers in fields or elsewhere, one parent is a doctor, one a teacher, two are farmers and one is a shopkeeper.

This is what is available to the children of Dineshpur:

- they have a teacher who has training and experience in mushroom farming
- they don't have too much space for farming.
- hay and cowdung manure are easily available.
- a temperature of 17-18 degree Celsius, which is required for mushroom cultivation
- the months from October to March are right for mushroom cultivation, since the

conditions are suitable for mushrooms.

The advantages of mushroom farming

- A large space is not required. Work can be done even inside a small room.
- Most of the materials required are waste products got from farming - these can be reused.
- The whole family can easily get involved in this
- This work can be begun with a minimum of Rs.500/-
- The mushrooms can be sold at the market and other necessities can be bought with the money
- Children get ample protein from this - mushrooms can be eaten every day.
- The compost can be reused in fields and gardens as a fertilizer.
- Day-long labour is not necessary

MUSHROOM CULTIVATION AND ITS RELATION TO SUBJECTS

<p>1. Relation to Mathematics</p> <ul style="list-style-type: none"> ● Profit and Loss ● Income and expenses ● Data Analysis ● Conversion (Market Rates) ● Area ● Unitary (If 200 g cost Rs 20, how much will 1000 g cost?) ● Averages ● Operations (Addition, Subtraction, Multiplication, Division) 	<p>2. Relation to Science</p> <ul style="list-style-type: none"> ● Renewal and non-renewal ● Parasites (Dead or Alive) ● Plants and Animals ● Chlorophyll ● Survey ● The pH value of Gypsum, and why Formalin is added ● Fermentation ● The discovery of penicillin, etc. ● Temperature measurement ● Heat ● Instruments ● Unit of measurement ● Conversion between deg Centigrade and deg Fahrenheit
<p>3. Relation to Geography</p> <ul style="list-style-type: none"> ● Weather and Climate ● Temperature ● From where is Gypsum obtained? 	<p>4. Relation to History</p> <ul style="list-style-type: none"> ● What could the origin of mushrooms be? ● The history of mushrooms ● Food and Drink
<p>5. Relation to Language</p> <ul style="list-style-type: none"> ● Listening ● Speaking ● Writing ● Reading ● Questioning 	<p>6. Food and Nutrition</p>
<p>7. Marketing and Packaging</p>	<p>8. Career and Employment - Any person (male or female) can do this work, either individually or in a group. Not much investment is necessary, and it can be started with very little expense, and still gain profits.</p>
<p>9. Climate - Cool weather is essential for mushroom cultivation, and hence, it can be done between October and March.</p>	<p>10. Mushroom Production Centre Pantnagar and Tarai Foods Limited are some of the resource organizations from which one can obtain advice and compost. These about 12 to 15 km from Dineshpur. Marketing is also easy - Rudrapur and Haldani are good markets.</p>

A few things about mushroom cultivation

Before we started cultivating mushrooms, we had a general discussion with the children and told them that we intend to start mushroom cultivation. We asked them things like - Have you seen them? What are they called in Bengali? The children said that they had seen it, but hadn't eaten it. They asked if it was available in the markets. They asked many questions, for example:

- Where do they grow?
- How do they grow?
- How do they grow without soil?
- Are mushrooms animals?
- What is added to the hay?
- Why are mushrooms always white?
- What do they taste like?
- Why are mushrooms shaped that way?
- What is inside the mushroom?
- Can we reuse the compost?

Preparation

When we discussed mushroom cultivation among the teachers, the biggest problem that arose was that of space - where would we grow the mushrooms? Though there was sufficient space in the school, we started searching for the right place. Everybody put forth their opinions, but finally we agreed upon one corner in the school. Then we started thinking about how to cover the space on all four sides so that sunlight cannot enter. We got a big table which we covered with polythene, and made a kind of room with it. We finished it within two hours with the help of the students and teachers. It was now ready for growing mushrooms.



Preparations being made before mixing the seeds (spawn)

Purchase of compost and spawn

We started this in December.

12 km away from Dineshpur is Tarai foods Limited where mushrooms are grown all through the year. We bought 50 kg of compost and a packet of spawn and the next day, along with the children, we mixed the compost with the spawn and wrapped it up with newspaper.

We told the children that the newspapers shouldn't be allowed to become dry, or else the compost would dry up. The children would look at it every day, and if they felt that the newspaper was drying up, they would sprinkle water on it and note it. They also noted down how much water they poured on it. 20 days after we mixed the spawn, we added casing (1.5 year old cowdung manure). The children participated enthusiastically in this. Whenever we needed a certain quality of manure, we told the children and they brought it from their homes and created compost with it. They asked several questions, such as - Why are we using pesticides? Why are we adding formalin? Why are we covering it with polythene? What will happen if we don't cover it?



Preparing the casing after mixing the seeds, and adding gypsum, pesticide and formalin to it

After preparing the casing, we added some water to it, and then told the children that the moisture in it should be maintained, and shouldn't be so much that the water flows away, nor should it be so less that the casing dries up. If it dries up, the mycelium will not come up, and even if it does, it won't turn into mushrooms. The children looked at it every day and added water if necessary. We did this continuously and the children started looking forward to the time when the mushrooms would start growing. When the mycelium didn't come up even after 15-20 days, the children started asking when it would come up, and that I'd told them it

would come up by this time. I also started getting worried because this was the first time I was growing mushrooms with children, and if it didn't come up, they would be disappointed, and lose their belief in this project. I started looking for a reason why it wasn't growing and found that the mycelium haven't come up because of excess formalin in the casing. I washed the casing with water and mixed it again into the compost. 15 days after that, we started seeing mushrooms. The children's excitement was worth seeing! The children from class 1 to 6 started arriving and counting the mushrooms. They even started competing about who would arrive first and count them and write the number into the chart that we'd hung up near it.



Mixing the casing into the compost

Picking mushrooms and weighing them

After picking the mushrooms, we cut off the roots, and we asked the children to weigh them in a shop nearby. They came back and told us that the mushrooms weighed 1 kg and 650 grams. I asked them if they had subtracted the weight of the vessel, and they said they hadn't. Then the children weighed the vessel, and then subtracted the weight of the vessel from the total weight, and told us that the weight of the mushrooms was 950 grams. Then we discussed with them about the number of grams in one kilogram, about how to take correct weight, and about addition and subtraction.

Harvesting the mushrooms and using them in the mid-day meal

On the day we had planned to pick the mushrooms,

the children arrived early to school. I showed them the mushrooms which had grown big and could be picked. They looked very excited. The children went to a nearby shop, got the mushrooms weighed and calculated how much the mushrooms weighed without the container. Then the mushrooms were washed with salty water, chopped, and then incorporated into the day's menu. They were very excited about the mushroom curry.

When it was distributed amongst the children, only some of them got to eat it. The ones who ate the curry said:

- It tastes like meat
- It is like rubber
- It tastes good

When we teach languages, we often say that children have to be encouraged to ask questions. Here, in the last two months, the children, not only those of Class 6, but children from Class 1 to Class 6, had asked a whole lot of questions. Some of the children wanted to grow mushrooms in their house. Some children wanted to know if mushrooms were useful to fight diseases. Others wanted to know how to differentiate between poisonous and safe mushrooms.

Considering the family background of the children, the speciality of that region, and the geographical conditions, we can select various kinds of activities and include them in the curriculum.

Education through work and relationship with friends and teachers

We often observe that children are afraid of asking teachers questions. So it is difficult to ascertain what the relationship between the students and the teachers is. Children will only ask questions when they can relate it to the subjects they are being taught. While being involved in Work in Education, we found that children formulate logical questions themselves to ask the teachers. This is because they connect it to their everyday life. They have discussions and conversations with their friends.

Sometimes, in order to prove a point, they put forth unique kinds of reasoning. For instance, one child said that we could eat all kinds of mushrooms. Another said that we shouldn't. In order to prove his point, the child said that if we can eat all kinds of mushrooms, then why don't we eat the ones that

grow on trees? We see mushrooms growing in the rainy season, why don't we eat those? One said that people collect mushrooms from jungles and eat them. Another said that he had read in the paper that a family of six had died by eating mushrooms from the jungle. So one child asked how we could make out whether a mushroom is edible or not. I told them that we can differentiate between edible mushrooms and poisonous ones.

Work in education and CCE

Continuous and Comprehensive Evaluation is an ongoing process. Children's evaluation has to be done continuously, and we can do this with education through work. When we think of evaluation today, only one picture comes to our

mind - testing the progress of children with pen and paper. We all know that every child has his or her own way of learning. If we give importance to only testing by writing on a paper, the evaluation won't be accurate because some children cannot express themselves well through writing. Some express themselves better by speaking, and some by doing. By education through work, we can evaluate all the facets of the children, like how they interact with their classmates, participation, responsibility towards work, thinking, understanding and logical reasoning, oratory skills, their yearning to learn new things, social skills, observation, their ability to relate to their subjects, and cooperation. Discussions are on with the guardians to encourage this activity in the children's homes.

Sahabuddin is presently a member of Azim Premji Foundation, Udham Singh Nagar. He earlier worked in the Learning Guarantee Program of the Foundation as an Area Coordinator at Rudrapur. He has a Master's degree in Political Science, Sociology and Education. He has 10 years' experience in the food industry and about 6 years in the education sector. He may be contacted at sahabuddin.ansari@azimpremjifoundation.org



Learning While Helping

**Suresh Kumar Sahu,
Rakesh Teta and Gulshan Yadav**



Dhamtari district, with its diverse geographical and social features, lies in the central part of the state of Chhattisgarh. A significant - and fertile - part of the district falls in the Mahanadi basin. Paddy cultivation under irrigated farming system is one of the important contributors to the livelihoods of the people in this area. A distinct area in the south of the district has an undulating terrain with thick forest. Collection of minor forest produce adds to the livelihoods of people in this area where mostly subsistence agriculture is practiced because of the lack of irrigation. Another area within the district is where four of the medium and large dams of central Chhattisgarh are situated. A large number of villages, many of them still not rehabilitated, were displaced due to construction of these dams. Fishing has become an important activity for many people in the villages falling under the catchment areas of these dams.

The above mentioned three distinct agro-ecological features influence the diverse livelihood patterns of people in these areas. Urbanization has been another factor influencing livelihood patterns of people, particularly in the adjoining areas of the upcoming small urban centres in the district. The demographic profile in the above mentioned three areas also has a pattern. While the Other Backward Classes (OBCs) form the largest group in the agriculture based area of Mahanadi basin, tribal population is greater in the other two areas of forest and dams.

A study is being conducted to map diverse livelihood patterns and understand the factors influencing the livelihoods of the people in these areas of the districts. Few sample villages have been selected to collect information from the selected sample of Households. The study has taken a mixed method approach using a number of tools for data collection such as household survey, focus group discussions, interviews and participatory wellbeing categorization.

We thought of including children in the process of data collection. In doing this, the following three types of tools were decided to be used in the data collection by children:

- The daily schedule: to understand gender-based differentiation in the work for both adults and children. Ten children (five boys and five girls) from each village took up this task.
- Village profiling: a format was prepared to capture data on demographic, social, economic, geographical and infrastructural information of the villages. One or two groups of four to six children from each village were chosen to undertake this task.
- Seasonal calendars: to collect data on agricultural practices and crop cycles, seasonal health issues, availability of Minor Forest Produce (MFP), local festivals and melas, and vegetables and fruits available in different months of a year. This task also was taken up by one or two groups of children from each village.

About 300 children of class eight from thirty two villages took part in this process. Our experiences, beginning with the enthusiasm shown by the children right up to the quality of the data collected, have been really encouraging, though we were not very confident in the beginning as we were not sure of both children's participation and quality of data. The issues related to research ethics was another problem we were grappling with. Finally, based on our understanding of the lack of space for children to connect to their own environment within the framework of school; we decided to go ahead despite our fears. This disconnect has long been identified by many and has also been diagnosed as one of the reasons for students' disinterest in the processes in the school.

The NCF 2005 underlines these problems as 'inflexibility' of the school system, where 'learning

has become isolated activity' lacking space for 'children to link knowledge with their lives'. The processes in the schools 'bypass vital dimensions of the human capacity to create new knowledge' and 'promote a regime that discourages creative thinking and insights'. The child's context has been excluded and 'learning has become a source of burden and stress on students and their parents'.

The NCF 2005 has also tried to address such issues in different sections of the document. The National Focus Group (NFG) on Social Sciences, for example, stresses the importance of inclusion of local, social and ecological contexts children live in. Similarly, the Position paper on Work and Education suggests introduction of a universal programme of 'work-centered education' based on the principle of viewing productive work along with all other forms of work (for example, activities, experiments, surveys, field-based study, social action, engagement with the community etc.) in the core curriculum as a pedagogic medium'.

The tasks we set were thought of as an opportunity for children to connect to their own environment. The students in the processes were identifying varied sources of information, collecting data (sometime two data contesting each other), verifying and triangulating them, going on to sorting and classifying the data. Knowledge construction about various things directly related to them from their immediate environment can be inferred to be happening. However, there were many other important processes that were happening in the course of tasks children were involved in. Few of such things are discussed here based on reflections from children.

Working in groups was one of the thing that children enjoyed the most in this task. Children divided the tasks within the group. Few took up the task of talking to village elders, others were assigned to talk to patwari or nurse or panchayat secretary. The advantages and challenges related to working in groups on such projects, children reflected provided them with learnings on this important area. A few of them said that they were not able to complete their tasks and were then helped by others. A few times the group showed its displeasure over member's lack of interest.

Explaining their work to the villagers and the village functionaries also provided them opportunities to

try out their communication skills, though students felt the responses (villagers and functionaries) were mixed. Some were very welcoming and appreciated their efforts. However, many also discouraged them and told this was are not their work and they should focus on their studies in the school. Clearly, the notion of learning within the boundaries of the school was very strong among such community members, though it was interesting that most teachers during our initial interactions welcomed the idea and few even helped the students in their work.

Many teachers used the analogy of projects work that children in some urban schools do to explain the tasks that the children in these schools were doing and they valued it in those terms. As a result, teachers from schools where we did not reach approached us to take up such tasks in their schools as well, showing that they are aware of the idea of broadening the learning space to include the local contexts. However, they also were bound by the conventional notion of classroom. Another issue that children faced during their tasks was of gender differentiation. The mixed group of boys and girls in few villages were accosted by the elders, who wanted to know why they were hanging out together.

In response to the question whether this experiment helped them learn anything new or in a better way, children overwhelmingly responded in the affirmative. They found that there were many things that we observed everyday but remained ignorant and didn't know enough about. In response to the question on the work of the village people, the usual response was 'farming'. However, when they started listing out peoples' occupations and the work people do, they ended up with many more categories. Thus, the format provided them opportunity to observe things in a more organized way and that helped them learn many new things.

The daily schedule also helped the children understand the differences in workload and types of work based on gender. We had the opportunity to discuss these aspects with students in a few schools. From the 'daily schedule' data the children had collected the children almost unanimously concluded that women/girls do more work within their own families. On the question whether it is fair to have such gender differentiation in work, also almost all of them thought it to be unjust. We found

this could be an excellent pedagogical tool to discuss the issue of gender with students in these schools.

Analyzing the data collected by the children indicates an interesting thing. While the quality of data was, in general, quite good, most of the gaps were to be found in the data accessed from government departments, such as land use pattern in the village to be collected from the patwari. The notion of official secrecy with the government system seems to be at play even at the village level.

Thus, clearly the participant children enjoyed the process and also had an opportunity to learn few

things about working in groups, sources of information, their immediate society and environment. In addition, they used their communication and negotiation skills in the process. One of the children explained to us that he felt good being able to help a researcher, someone who he considered was doing some 'serious' or 'important' work. Just being able to achieve this feeling of agency among the children made the whole exercise worth the effort, irrespective of any other outcomes achieved.

Suresh is working with DI, Dhamtari and is also part of Livelihood Initiative at Azim Premji University. He currently is engaged in livelihood mapping research and understanding the livelihood choices of rural people in Dhamtari district. He earlier has worked in development sector mostly on the issues of agro-biodiversity, food security, Indigenous traditional knowledge and decentralized natural resource management. He may be contacted at suresh.sahu@azimpremjifoundation.org

Rakesh is working with DI, Dhamtari and is currently part of Social Science team. He has also been involved in working on the idea of work and education with few selected schools in the district. He earlier has worked in development sector in tribal regions of Chhattisgarh. His area of interests include understanding diverse social contexts and cultural practices. He may be contacted at rakesh.teta@azimpremjifoundation.org

Gulshan is working with DI, Dhamtari as Fellow since 2013. He has a Master's degree in Business Administration with a specialization in Marketing and Human Resources and an M. Phil in Management. He earlier has worked in the area of Computer Education. He may be contacted at gulshan.yadav@azimpremjifoundation.org



A Powerful Means of Integrated Holistic Learning

Sushama Sharma



Learning by doing – Our experience at Anand Niketan school, Sewagram, Maharashtra

It was for the first time that we had planned to plant onions as a single crop on separate beds for individual students of classes VI and VII. The seedlings were ready but the beds were to be prepared. Our gardening teacher was guiding students in preparatory work. Though a head teacher, I too was as new to this as were my students. I was curious to know and join the group. When I reached the garden I saw children totally enjoying the work. They had loosened the soil and the beds were flooded with water and were pounding soil and water with their feet to make it muddy and they were enjoying the whole process thoroughly. They were not bothered about their clothes getting soiled in the whole process. Finally, the prepared onion seedlings were transplanted. The school had got a good yield of onion crop last year. These organically grown onions were used in school kitchen and some sold to the teachers.

It was easy to learn that onion was the modification of stem and its bulb stayed underground during growth. So was easy to relate to other examples of modification of stem, root, etc. as they harvested turmeric, radish, carrot, and beet. Growing vegetables as an essential aspect of the school curriculum in the monsoon and rabbi seasons opened up an enormous scope of learning of a different kind for all levels. Just to list a few -

- 1.Observation of different kinds of plants- both crop and weeds. This meant observation of leaves, root system, stem and branching, flowering, fruiting, seeds, which further facilitated learning about the grouping, use and threats faced.
- 2.Preparation of land for different type of vegetables - fruit vegetables, leafy vegetables and tubers, sowing methods and other specifications.
- 3.Understanding the importance of soil fertility, role of insects, earthworms, fungi and microbes to keep the soil alive. Importance of social insects like ants, termites and honey bees in agriculture.
- 4.Importance of recycling of biomass through different methods, such as composting, mulching as well as preparation of compost, using cow dung, and nutritional organic supplements.
- 5.Observing and understanding pests and beneficial insects and their life cycles, preparing and spraying pest repellants.
- 6.Taking care of the vegetable plots/ gardens by regular weeding, hoeing, watering, adding manure, spraying etc. Learning to use different tools like sickle, fork, spade etc.
- 7.Understanding the role of sunlight in scientific processes like photosynthesis, transpiration, pollination etc.
- 8.Measuring and designing of plots for growing vegetables. Counting/estimating number of plants in a plot, using addition and multiplication, measuring the perimeter, area under cultivation, open space area, drawing maps, weighing the yield, keeping records of the yield, selling vegetables etc.
- 9.Keeping weather record, for example measuring minimum and maximum temperature, humidity, rainfall and presenting it graphically.
10. Knowing nursery techniques. Digging pits and planting trees. Use of simple drip method for watering tree saplings. Comparative understanding of irrigation methods.
11. Understanding the hazards of scarcity of water as well as excess water.
12. Understanding the larger issues related to

excessive exploitation of ground water, unequal access to water availability, market influenced crop planning leading to excessive use of water, mono-cropping, local nutritional un-sustainability etc.

13. Understanding the gender aspects, for example, what water scarcity means for women, who are traditionally allotted the work of fetching water.
14. Learning to work independently by taking care of one's own plot and learning to cooperate with others in order to perform well. Sharing work and the money earned, based on rules stated collectively. Exposure to the idea of traditional cooperative practices in some societies where such shared practices still exist.
15. Understanding larger issues related to soil degradation, pollution due to excessive use of pesticides and chemical fertilizers, food and nutritional security, biodiversity of food etc. through extra readings.
16. Understanding broader issues related to the market. The injustice farmers face due to lack of appropriate prices they get for their products, inappropriate import – export policies, the cost farmers have to pay for seeds, fertilizers and pesticides affect farmers' economics adversely. News items and articles from newspapers, books and websites and dialogue with experts can enrich the learning.
17. Broader issues related to crop planning, the high water requirement of some crops resulting into excessive extraction of ground water, salination of land etc.
18. Last but most importantly, to learn that the work is essential for our survival and thus needs to be honoured, as also the persons doing it.

This list can be elaborated age and level wise. Thus, what needs to be pointed out here is that farming, as a regular school activity, exposes children to integrated, rich and 'close to real life' understanding and skills on multiple aspects besides academic understanding expected through compartmentalized textbooks. It breaks the hierarchical authoritative relationship between

teachers and students as both of them work together in the fields. There are a few more work based activities designed in the areas like cooking, vastrakala (art of fabric making) and energy that have a potential to facilitate learning and applied understanding. Many more could be designed based on school's situation and needs.

Work: A means for holistic learning

It is very important to point out that incorporation of work in education should not be looked upon merely as vocational education. It has much larger role in learning and can be used as a means for holistic integrated learning. There is a need to develop teacher's vision, motivation and capacity to facilitate such learning as it demands a lot more professional absorption than conventional subject teaching. Simple and basic crafts and work is more observable and manipulative, thereby providing a concrete context for learning. However, all things cannot be easily integrated with productive work. A good combination of activities related to environment and the local society can provide a very rich situation for learning. Running the school on a participatory model itself can be a good means of learning.

At the very beginning of the school, we had decided to incorporate physical work as an essential component of school education with the conviction that it has an immense potential of cognitive, physical, social and emotive development. Thus, the assumption was that systematically and scientifically carved learning experience will certainly help to develop holistic personality and responsible citizenship.

Like many others, we too were concerned about excessive bookish and competitive nature of schooling that dishonoured individual differences in children's abilities and potential. Similarly, we were disturbed by the differential treatment our society gives to all those who work manually. Here are some of our concerns:

- What makes us differentiate productive and physical work from intellectual work?
- Why is manual labour so lowly paid?
- Is it just the demand and supply that is responsible for the situation, or it has to do with our skewed value system that has devalued some types of effort consciously in the interest of some people?

- Does productive work necessarily lack an intellectual aspect?
- Is only bookish knowledge enough to succeed and extract all creative faculties of a human being?
- Does physical work have any role in developing the intellect?

We think that it is important for both teachers and students to ponder all these questions. Involving parents in such discussions can help a lot to work more effectively.

Unclear purpose of education leading to a chaotic society

Education does not deal merely with the cognitive dimensions; it also has to deal with the social, cultural, political and economic dimensions of society, its purpose being to equip an individual for personal and social life and also to help individuals build an equitable, just and nonviolent society. Gandhi said the purpose of education is 'character building', obviously because then, and only then an individual derives the moral strength and confidence to act according to the welfare of a society.

After independence, as a republic state, we accepted the constitution which gave us certain rights - right to freedom, equality, fraternity and justice which cannot be enjoyed without committing to duties. How do we help our children learn all this? How do teachers and adults themselves become the learners on this path? We cannot escape from many of these questions while planning for education. We are living in a global world today which is technologically very highly advanced and centralized. We too as a nation have reached these technological heights. However, we, as a nation, have not yet been able to tackle basic issues of nutritional security, providing clean water, sanitation, primary education and basic health services to all our citizens. We, as a political and social system, have failed to respond sensitively and in prioritization of our needs.

All the intellectual community holding different powerful positions seem to be ineffective in acting and taking policy decisions in the interest of all. Rather most those benefitting from the system seem to be more and more concerned with their selfish motives, leading to increasing

marginalization of rural and urban manual labourers. It is unpalatable to say that, even the positions held, such people are not able to understand what their decisions cause to the underprivileged and to the environment in the long run. The increasing severity of environmental problems means that we have to question the very understanding the words- 'development' and 'progress' that are being promoted globally by the market forces.

Both the rich and the poor worldwide need to revisit these concepts. It's high time for us to understand that 'humanness' lies not in the quantity we consume but the way we relate to each other and with the earth that has been helping us to survive. It's time to conserve and keep clean our soil, water and air for us and for the generations to follow. This can only help us in getting away from the excessive greed. We have to inevitably think of new lifestyles that are less energy intensive and environmentally more conservative that keep us healthy physically, mentally and spiritually at both the individual and societal level.

Education needs an integrated and holistic approach

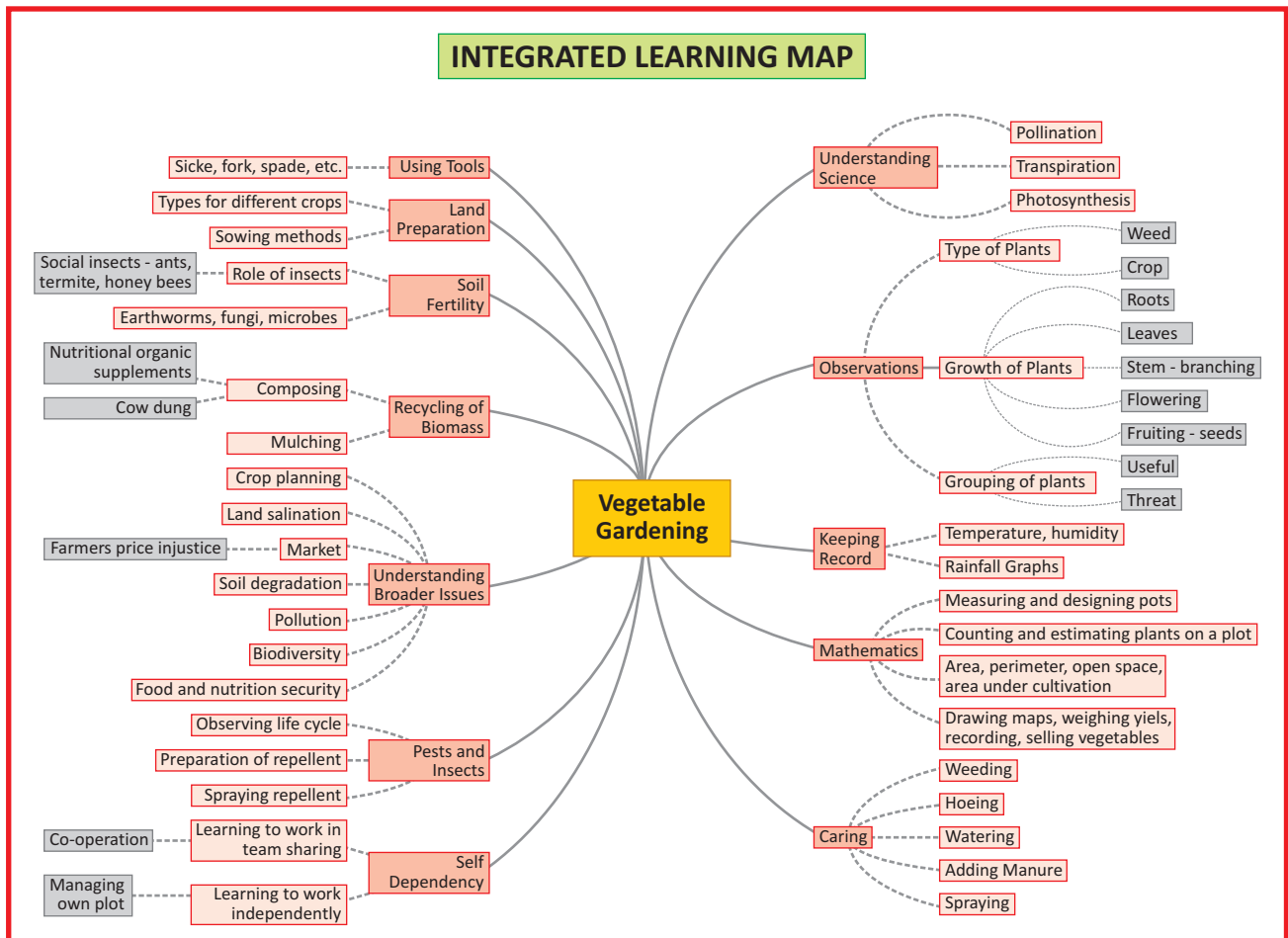
Our children need to understand this reality, the need to address and respond to it creatively, responsibly and collectively in order to change the situation. Our educational system has been largely unresponsive and non-committing in practice. This has resulted in highly irresponsible attitude and very poor civic sense. Besides this, our education has also been deskilling our children from basic skills. There is an acute need to bring revolutionary changes in it. The challenge ahead of us is to make it holistic providing good foundation to lead life with skills, values and analytical ability.

Historically, societies have survived, flourished or collapsed for various reasons like environmentally unsustainable management of resources and imbalances in human relationships within and with outside societies. Ours is a country with complex issues. We need to learn from the past and change towards sustainable future for all and also for the future generation. To me, this would mean heading towards a way that will enable every individual and society to be productive, creatively responsive and

situated sustainably wherever they are. Science and technological innovations need to be directed towards this.

Let us not think 'basic human nature' is to be greedy and competitive. Let us not end up identifying

ourselves as mere consumers. We can surely be imaginative and confident of evolving ourselves as an intelligent creed that is better organized as a species and is in tune with the spirit 'vasudhaiv kutumbakam (वसुधैव कुटुम्बकम्)'.



Growing a nursery



Water conservation through experiment

Garden activity enjoyable and absorbing even for the young



Sowing onions



Collecting dry biomass for composting



Care and patience



Child learning to spray repellent



Observing differential growth in shadow and sunlight



Measuring growth



Plucking vegetables from the garden



Everybody curious and eager to weigh the yield



Weighing the yield

Sushama is the Principal and Founder Member of Anand Niketan, Sewagram, Maharashtra. The school is inspired by the Gandhian Philosophy. Anand Niketan is a school for children from 3 to 13 years, started in 2005, in the premises of Gandhi Ashram, as a neighbourhood school. Deriving inspiration from Gandhiji's philosophy of education, Sushama, along with her team, has been trying to experiment and derive ways of holistic and work-based education on sound psychological and cognitive foundations. With an academic background of M.Sc. Anthropology (Pune University) and M.A. Elementary Education (Tata Institute of Social Sciences, Mumbai), she has been working in the field of education for last 25 years. She is basically an activist in orientation, and has worked for 15 years in rural areas of Wardha district through a voluntary agency. She has worked for integrated rural development with a special focus on education of pre-school and primary school children. She has also worked with women, youth and farmers with an integrated approach towards sustainable development. She may be contacted at sushama.anwda@gmail.com



Aiming for Work-centred Education: Introduction to Basic Technology (IBT) program in secondary schools in Maharashtra

Yogesh Kulkarni



**Dhanaji Nana Vidyalaya, Khiroda. District - Jalgoan,
Maharashtra.**

August 2014

The students of Class 9 decided to conduct an energy audit of their school and hostel building. They brainstormed on the various ways to reduce electricity consumption. Their teachers had already introduced them to energy audit forms and how to fill it. Students divided themselves into the groups and recorded energy consumed at each place. They noted that electricity can be saved by switching off lights in toilets and bathrooms in the hostels at night. They shortlisted ideas such as installing automatic circuits which can be switched on and off the light simply by clapping hand. They made the circuit and installed it. Another group made a circuit and installed light sensor for street light which would switch on and off depending on the intensity of solar light. Students used a Do-It-Yourself (D-I-Y) manual and made the circuit by using tools available in the school with guidance from their electrical instructor and as part of the project, costed the work.

They also considered different questions such as why, what, when, where, how and searched for answers from different text books. There were many questions for which they could not find answers and these were enthusiastically marked by students and teachers as 'HPNPD' short form of Hindi word 'Hame Pata Nahi Par Dhundh Lenge' (We don't know but we will find it out)!

**Agricultural M.P High school, Jamgoan District,
Ahmadnagar, Maharashtra**

August 2014

Students of 9th class carried out electrical wiring of their classroom because they wanted an electrical point for the LCD projector. They were studying 'Electricity' in their science curriculum. Their teacher asked them to draw an electric wiring diagram, with electric symbols, and make an

estimate of cost of wiring which the teacher helped them buy. Simultaneously, subject teachers introduced concepts like current, voltage, wattage, size of wire, earthing, simple phase/3 phase etc. They also learned about the history of electricity and story of Faraday and Edison. They wrote a report of their experience.

**Gopal Gandhi Ashramshala, Mangaon District,
Raigad**

December 2013

In a class while teaching different calorific value of fuel, students were asked to prepare kichadi, using different fuel such as wood, kerosene and LPG. They cooked equal amounts of rice and took readings of fuel used and time it took to cook. They also recorded observations of the amount of smoke emitted, blackening of utensils, etc. They found out their wood stove was the most inefficient, giving rise to a discussion for the reasons behind it. This led on to the productive task of construction of a smokeless chulha.

Above are some examples of Introduction to basic Technology (IBT) program. The program is running in more than 122 schools in four states.

Introduction to Basic Technology (IBT)

A scientist turned educationalist, Dr S S Kalbag, firmly believed that 'learning while doing in real life situation is the 'natural way of learning'. This is the way, in which we learn our mother tongue. We learn to swim, to cook, to drive, to operate a computer by this method. In fact whatever we can do is always learned by learning while doing. This method is so effective that it trains school dropouts into successful entrepreneurs without burdening them.

Dr Kalbag wanted to find ways to introduce this methodology as a part of mainstream education. Thus, the IBT program was conceived and introduced in 1987. It is a pre-vocational program

which was implemented from Classes VIII – X as an experiment with the permission of the State Education Board (SSC), Maharashtra, in three schools from 1987-1990. It was accepted as an optional subject in 1990. From 1990 till date, IBT is introduced in various schools in different geographic and economic regions. Recently Maharashtra government, has included IBT as a core subject under the RMSA vocational scheme.

The IBT is a very good example of how any innovative intervention in school education can take the route of experimentation in schools, scaling up as a pilot program and finally becoming part of mainstream education.

In the IBT program, the syllabus is the whole of nature, which is broadly divided into four sections: engineering, energy-environment, agriculture-animal husbandry, food processing. Students carry out various socially useful productive work, one day per week (20% of school time) in these areas. Instructors are people from the community with demonstrable skills. Work activities are related to the curricular area and subject teachers explain the theory and principles behind the task carried out by the students. Basic principles of IBT program are shown below.

IBT Principles

1. Students will learn by 'Learning while doing'.
2. Students will learn multiple skills in nature.
3. School will provide various services to the community at modest cost.
4. Instructors must have demonstrable skills.

Table 1: IBT Principles

Impact of IBT

The IBT programme was evaluated at every stage of its development by different agencies. Some of them are PSSCIVE, NCERT, IIT-B, EWB & also internally by VA. The following benefits have been recorded:

- Students' interest in the school increases.
- Students get wider exposure to world of work
- Students' understanding in curriculum area increases
- Increase in enrollment and attendances is recorded in several schools

- It helps students in selecting their future career preference
- School becomes a happening place

A comparative study of students who opted for IBT and those who did not was conducted in 2009. Three IBT schools and three non-IBT schools in the same vicinity were selected. They were evaluated as per the approved syllabus and competencies expected from the students. A questionnaire using Bloom's Taxonomy was designed. The results of the study are presented in Table 2. It was observed that IBT students performed better in parameters like understanding, application of knowledge, analytical ability, evaluating the situation and creativity.

Information	Understanding	Application	Analytical ability	Evaluation	Creativity
11.7%	22.6%	36.3%	20.9%	55%	63.9%

Table 2: Performance of IBT students vs non-IBT students

An independent third party evaluation of IBT programme was done by Lend-Hand-India in 2012. They have recorded following impact

- 49% IBT students (2011-12) enrolled for technical courses after SSC. This is higher than the 16.81% all-India enrolment rate and 20% enrolment in a controlled group.
- 14% girls enrolled for technical courses when national GER for girls in rural areas is 8.3%. For boys, 38% enrolled for technical courses when National GER for is 13.7%
- Out of 31% students who are not pursuing higher studies after Class 10, only 15% remain unemployed. The rest are employed/self-employed or engaged in agriculture.
- The percentage of students starting their own enterprise/becoming self-employed in almost three times higher than controlled group.
- Dropout rate has decreased by 17%.

IBT programme is being implemented in different geographical region of Maharashtra. It has also started in few schools in Chattisgarh, Goa, Karnataka. Many NGOs are adopting IBT programme and implementing it, thus proving that it can be replicated.

Reasons behind success of IBT program

Following are the important factors for the successes of IBT programme.

1. Curriculum: The programme prescribes nature as its syllabus. It broadly defines basic concepts and technologies to be taught. Therefore it is flexible and can be adapted to local conditions.
2. Community services: Students provide various services the community which pays for such services. Students get real life training. It also helps to keep the programme updated as per the community needs.
3. Being recognized as a subject: IBT started as a formal subject with dedicated periods in the timetable with formal permission from State examination board (SSC) in 1987, though Vigyan ashram led the program and kept on updating and experimenting with it. Formally it was conducted under the monitoring and implementation mechanism of the State Education Department

and Directorate of Vocational Education & Training. This helped in demonstrating its importance in government system and it helped IBT became part of core curriculum of Maharashtra state.

4. Instructors: Implementation of IBT will need skilled, technically qualified instructors which is difficult to get in the village. Hence instead of specifying formal qualification for instructors, IBT asks for instructors with 'demonstrable skills'. Young local entrepreneurs such as electricians, masons, fabricators, etc. are selected and trained as instructors. They are encouraged to enroll for the Diploma in Basic Rural Technology (DBRT) course of NIOS (National Institute of Open Schooling). This helps to create a sustainable local human resource.

Operating costs of the programme

The following strategies helped in keeping down the costs of the programme:

- a. Providing chargeable services to the community: This also helps in lowering the cost of raw material required for practicals. Most importantly, students get real life training.
- b. Charging fees for the programme: It ensures parents' involvement and keep them informed about the programme. The present operating cost of the programme is Rs. 1000/- per student per year.

Content of the IBT program

Department of Science and Technology, Government of India funded the pilot of IBT in 1987-1990 and still supports the development of design manuals on basic technologies. Teachers' handbooks are printed by the SSC board. Vigyan Ashram has made videos, power-point presentations and manuals to ensure lower dependence on instructors for delivering the message to the students. In last few years, Vigyan Ashram has started developing 'Open Education Resources (OERs) for the IBT. These OERs are lesson plan which will help teachers to integrate work and subject areas. These OERs are available on www.learningwhiledoing.in

Limitation of IBT program

Dr Kalbag was inspired by Gandhi's thought on education. He chooses "appropriate technology" based activities for productive work. These productive tasks are in line with their curricular subjects. Unfortunately our education system has failed to understand the holistic nature of IBT. It has always been considered a vocational subject and almost no attention is given to the pedagogical significance of IBT program.

Schools teachers are expected to teach students academic portions related to productive work. It is easy to link technological activities to principles in science and mathematics. But integrating such live work activities with syllabus of the social sciences and languages is a difficult task. School teachers are not trained to conduct class on such live case

studies. It also leads to questioning on some of their own practices which teachers find uncomfortable. Therefore it can be said that IBT programme needs to experiment on integrating social sciences and languages around productive work.

Learning approaches like Nai Talim, Work-centred education, Design thinking, Project-based methodology, Activity-based learning and so on are essentially calls for learning while doing in schools. IBT program is trying to introduce this methodology in formal schools. It is trying to do it by considering our financial constraints and huge numbers. The program has evolved over last 30 years. It is necessary to build on its achievement and successes and work on the limitations to bring change into the education system.

Dr.Yogesh Kulkarni is working as Director of Vigyan Ashram. He is engaged in training rural youth, especially dropouts, on various appropriate technologies and helping them to start their own enterprises. He is credited for spreading the pre-vocational program, 'Introduction to Basic Technology' in 100+ schools. He is a practitioner and strong advocate of 'Learning while doing in real life situations'. He has started a Fab Lab for digital fabrication at Pabal with the support of MIT (USA). He may be contacted at vapabal@gmail.com



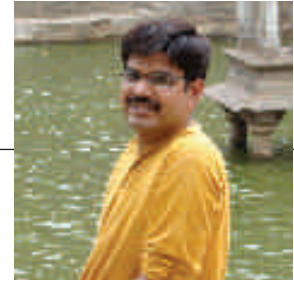
Some Large-scale Efforts





Learning to Live Sustainably - Reflections based on the Paryavaran Mitra programme

Pramod Sharma and Annie Gregory



What is the difference between awareness and education? The reason we have been asking this question is due to the widespread realisation of environmental concerns, but not enough reflection on how the issues are to be addressed. But the moment we ask if awareness can solve the problem then why did most of the people who came on a two wheeler for the session, not wear helmets (this was in Ahmedabad but would be true for most of the places), there is an immediate realisation that we are talking about education that is internalised, solves problems and help take action instead of just being aware of the advantages of wearing helmets and writing essays on it.

Here, we are talking of education to save the only planet that is our home, saving a planet that not only sustains us, but houses million of species that interact in cyclic systems with abiotic components to make it possible, an education that allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. This means understanding the concepts and taking actions in form of handprints i.e. positive action towards sustainability.



Students learn how to make recycled paper

Education for Sustainable Development (ESD) means including key sustainable development issues at all levels of teaching and learning with an objective to empower learners to change their behaviour and take action for sustainable



development. To highlight attention to this, 2005-2014 has been dedicated as the Decade for Education for Sustainable Development (DESD) with UNESCO as the lead agency.

Education for sustainable development

- is based on the principles and values that underlie sustainable development
- deals with the well-being of all four dimensions of sustainability – environment, society, culture and economy
- uses a variety of pedagogical techniques that promote participatory learning and higher-order thinking skills
- promotes lifelong learning
- is locally relevant and culturally appropriate
- is based on local needs, perceptions and conditions, but acknowledges that fulfilling local needs often has international effects and consequences
- engages formal, non-formal and informal education
- accommodates the evolving nature of the concept of sustainability
- addresses content, taking into account context, global issues and local priorities
- builds civil capacity for community-based decision-making, social tolerance,



environmental stewardship, an adaptable workforce and a good quality of life

- is interdisciplinary. No single discipline can claim ESD for itself, and
- all disciplines can contribute to ESD.

These essential characteristics of ESD are an opportunity as they can be implemented in various ways that take care of unique environmental, social, cultural and economic conditions of local context with global linkages and bring about a paradigm change in how teaching and learning happens in our education system. The only practical way is to get the children involved in projects designed to engage with real life issues as means of knowledge acquisition, developing values and higher cognitive skills leading to the desired sustainability behaviour. In conceptualisation it is very close to Nai Talim that advocates participation in productive work under conditions approximating to real-life situations.

Paryavaran Mitra – A ‘Handprint’ approach to education

Paryavaran Mitra brings to itself CEE’s learning of more than 30 years of working with schools systems in varied contexts. Designed as a Sustainability and Climate Change education programme employs ESD as a means of education. The programme launched in 2010 after a successful ‘pick right’ campaign with two lakh schools on climate change education and selection of Paryavaran ambassador. Dr APJ Abdul Kalam was chosen by children as the Paryavaran Ambassador and the enthusiasm generated by the campaign was an opportunity to focus on a programme with Project Based Learning as pedagogy. Handprint then became the symbol of the engagement of children from classes 6 to 9 in action towards sustainability. The programme has an outreach of over two lakh schools and works in

15 languages. The programme is enriched with the partnership of more than 160 organisations at various levels.

The emphasis of the programme is on ‘activities’ that are linked to the curriculum, replacing the conventional methods to help children understand the relevance of the Handprint approach in the local context or our lives, and apply it. In a way it challenges the role of a teacher to a fellow learner with no qualms in creating a new culture which says, ‘I do not know that, shall we find it together’.



Students cleaning the area around the hand-pump

The activities might include audits (surveys, interviews, etc.), demonstrations, games, field visits, performances, experiments, raising a medicinal garden or setting up a system of waste management that helps students to learn concepts through experiential learning in their immediate context. Such an approach helps children to actually ‘see’ different interconnections. It helps them see an issue from different perspectives of the people connected with the issue. The knowledge helps them to think of various possible ways to address the issue from the people who directly experience it. This is a different approach to what we call ‘problem solving’ where the emphasis is on the process than just environmental improvement. Where, all that matters is that one sees the details because, as J. Krishnamurthy said, ‘Understanding the problem is half the solution’. After gathering such important knowledge, perspectives on an issue it becomes easier for one to reflect and act.

Some experiences and ways to see work-based pedagogy

In one school project on the water theme, students were looking at different aspects of water like flow, usage, wastage, rainwater potential, quality, etc. The teacher distributed the tasks amongst groups of



Working at organic kitchen garden

students. Aspects include flow of water i.e. where the water comes from and how it is used and where it goes was connected to geography, water in our culture and literature to language class, math was linked to the rainwater harvesting potential of the school and wastage usage was connected to plain observation and thinking of ways to address wastage. If the students have discovered a leaking tap and calculated how much water drips in a day, it will lead to action which could be to convince a principal to fix the taps or even better to learn and teach to fix the taps. The students also looked at the quality indicators like pH, hardness, etc, which can be easily connected to several activities related to the use of water in the student's everyday life and health. This helps students to compare against the standards and say if the water in their context is good enough for drinking!. Through this process students continue to learn and this learning further empowers them to take action to fix/improve/sustain efforts. All of these things have one more thing in common; it is all a lot of fun, collaborative work, thinking and integration of concepts in subjects.

Different ways of seeing actions

We see a spectrum of worldviews. In some rural schools work is part of the learning atmosphere where environmental action projects are perceived as essential means of learning in the school. At the Dhablat Lakshman Paribesh school in Sagar island, West Bengal, several such initiatives are part of school life. The waste is managed by segregation where the wet organic waste is composted to yield manure which is used in the vegetable garden, with the produce being used in the school kitchens. Energy usage in the school is substituted with solar power which is maintained by the students that includes systems installed in the village. In another

school in Sagar island, students from the local community learn mango grafting at school. Through this they not only learn about biodiversity, good agricultural practices but also as it their source of income when they sell the mangoes in the open market, they also learn about markets, costs, supply and demand. In the school older students mentor younger students in this skill thereby continue to work and earn while they study. The two examples bring to light the aspect of entrepreneurship which instils in them the sense of empowerment. They seem to be confident in managing their school's energy consumption and in the other case they are confident of their skill in mango grafting which provides them with the skills to be able to contribute to their family income and to be able to make education possible, along with work.



Dhablat school - Vegetable garden

In many schools students carry out plantation drives on huge tracts of land where they do all the digging, planting, watering, etc. as there is still no culture of non-teaching staff and all the work in the school is divided amongst the students. The ESD challenge that the students who do all the manual work as passive doers understand the significance of plantation, knows the species they are planting, its significance in the local context, etc. Environmental action projects are a lot of work and its complexity increases as it proceeds from exploration, discovery, thought, action, and reflection. It is work that increases in complexity both at the cognitive and physical levels. For example, for a school to influence the community and some farmers to adopt practices like composting, using natural pesticides demonstrated by the students took four years. The key driver in this case and with our experience with many schools is the teacher who has the passion and commitment and is looking for ideas.

Overcoming challenges

One of the challenges in our formal education system is to recognise who can teach. Why shouldn't students consult with the school gardener on local plant species, their importance and survival rates? Wouldn't he/she be the best person to ask? Wouldn't the sweeper have valuable insights on how the school can handle its waste? The ability to empathise and more importantly to realise the value of the experience gained through project work and interaction with people needs to be recognised by teachers and parents. We have some examples of involving traditional healers, although these are rare and needs attention.

The other challenge is the multidisciplinary or interdisciplinary approaches requiring collaboration between teachers and grades to effectively benefit from the transformative process. The regimentation of environmental education as rallies, drives and events along with clubs is the biggest barrier. Also, there are not many examples of student -led initiatives and projects that are

spread over subjects and months. There is a need to learn and demonstrate to teachers what student led action projects would look like. For the whole learning cycle to complete itself requires supportive environments where students are given the guidance, role models and the freedom to explore their full potential. The learning process has to be flexible, adaptive and link global and local perspective.

ESD is a process-oriented approach and can strengthen education by giving importance to learners and the context. Smaller evidences lead to larger evidences. It takes time to see visible changes that are long term. In last few years, we are seeing more openness amongst schools and teachers to such initiatives. The big take home message from all the trainings that we do as part of the Paryavaran Mitra programme is for teachers to not only see the 'Environment' (read environmental outcomes) but the 'Educational' outcomes. Educational outcomes can make and sustain change out of an event of plantation, a campaign of saving paper, a day of conserving electricity.

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Paryavaran Mitra is an initiative of Centre for Environment Education in partnership with Ministry of Environment, Forests and Climate Change and ArcelorMittal, India. For details visit www.paryavaranmitra.in.



Ms. Annie Gregory is a Programme Officer with the Paryavaran Mitra Programme Secretariat since 2010. She has been involved in the initiative called 'Young Leader for Change' to demonstrate to stakeholders the engagement of students in projects addressing local issues. She is a graduate in Behaviour, Education, and Communication from University of Michigan -School of Natural Resources and Environment. She may be contacted at annie.gregory@ceeindia.org.

Mr. Pramod Kumar Sharma is handling the secretariat of Paryavaran Mitra programme. Starting as a school teacher, he now has 16 years of association with school systems. He has been part of the expert teams to Bhutan, Nepal and Maldives for strengthening Environmental Education in their school system. He has also prepared/contributed for the India's country report to UNCCD, CSD and DESD. He may be contacted at pramod.sharma@ceeindia.org



Earthian Program - Through the Lens of Work and Education

Shaheen Shasa and Sreekanth Sreedharan



Earthian is a sustainability education program for schools and colleges run by Wipro. For the purposes of this article, we will consider only the school programme going forward. Earthian, now in its fourth edition, is an annual program with two phases – in the first phase, teams of students (guided by teachers) participate in an activity-based learning program and ten schools that perform comparatively better are selected for an award; in the second phase, the Earthian team works together with the selected schools at the curricular and the school and classroom level to further sustainability education.

Sustainability education and the Earthian activity-based programme

The term ‘sustainability’ in this context relates to the sustainability of human species on the planet earth. Though there are different interpretations about the idea of sustainability, for the purpose of this exercise, we can borrow the most common understanding (derived from Brundtland Commission Report, 1987) and define sustainability as ‘meeting the needs of the present generation without compromising the ability of future generations to meet their own needs’.

Our lives are increasingly dependent not only on resources and conditions in our immediate neighborhoods, but also in places far away from us. Besides, the various resources that make our lives tick are all connected to each other in an intricate web. In school, we learn these different aspects in different chapters or different subjects, often in isolation from each other. As a result, we often do not see how these fit together. This dependence of the local on the remote and the global, and this interconnected nature are two of the main reasons why sustainability becomes a complex topic. In addition, different stakeholders involved in complex social problems often have varying views on why they happen and how to resolve them. As we enter an era of increasing ecological and social disruptions

and uncertainties, education could equip the child to understand the complexity of the problem, the interconnected nature of things, the multiple perspectives on its cause and effect and collaborate with others towards meaningful solutions. This is what sustainability education is all about.

The activity-based program in Earthian 2013 was based on the theme of water. Water, a concrete reality in the daily life of the child, is a core sustainability concern, and the program tries to use this theme to provide a genuine experience, ideas and insights within sustainability. In this program, the students identify the different sources of water, measure and identify patterns of water usage and assess the quality of water, all in their school campus. They are encouraged to connect what they learn in the activities using questions like ‘how is the quality of water related to the source?’, ‘how is water from different sources used?’, ‘is there a linkage between water and energy or water and biodiversity?’

The core purpose of the above activities is for the students to learn to ‘track the trail’ and ‘connect the dots’. These are two important ideas within sustainability. ‘Track the trail’ is to understand the flow of materials and energy (including waste) in anything that we use or do, be it water, food, agriculture, sanitation or satellite communication. The aspect of connecting the dots is about understanding the relationships across domains like water, energy, food etc and developing an integrated understanding of their relation to life, limits if any, cause and effect etc. This kind of learning is fundamental to sustainability education as sustainability can be truly aimed for only on the basis of a sound and comprehensive systemic understanding.

Some experiences and reflections from Earthian 2013

It is common knowledge that water is a scarce and

precious resource essential for life. But how well do we 'know' water and how does this knowledge influence our actions?

Mapping the trail of water on campus, identifying sources, measuring usage identifying leakages and testing water quality helped students understand water more closely thereby generating fresh perspectives. For many, measuring the amount of water they used in the campus or in their homes was a revelation – their prior estimation and actual measured usage often differed significantly. The measurement helped them develop a real sense of quantities – how much water is used for drinking or cooking; how much water is consumed when a tap is left running or water keeps dripping through the day. They tested the quality of water and wondered why the water from one source was poorer in quality than another and went about finding ways to fix it. Some initiated campaigns in school to reduce water usage, some got the school authorities to fix the leakages. The water consciousness was so high that many said if they heard water dripping anywhere, they could not rest till the source was identified and turned off. For most children who participated, the experience seems to have produced some learning, action and/or behavioral change.

It's not all positive stories alone. Some noticed that the water in their nearby pond is polluted and also that the sewage from their school is being emptied into the pond, but didn't seem to make the connection. In many cases, we saw that the syntheses of the activities or the expected interconnections were not made. In most cases, the complete spectrum of learning outcomes that the program intended was not achieved. These could be due to various reasons including deficiencies in the design and the lack of adequate support to teacher. But the above experiences show the learning potential that such an activity has if designed and executed well.

How does this connect to the curriculum?

Sources of water, rainfall, groundwater, topography and mapping (Geography), water contamination, testing and filtration (Chemistry), calculation of water harvesting potential, estimation techniques (Mathematics) are some of the concepts and skills related to the activities described above. An interested teacher can connect the dots further and introduce the children to social and historical usage

of water in the area, correlate it with local biodiversity, the changing rainfall patterns or larger issues of climate change and energy and so on.

None of these are concepts newly introduced by Earthian as they are already present in the curriculum. What is interesting perhaps is the way the programme requires students to bring these concepts together and apply them in the context of something real and concrete in their surroundings like water. The integration of these concepts under a common theme increases the understanding of the concepts and their interconnectedness. The documentation and reading and writing involved in completing the submission also provides an opportunity for the children to use language to communicate what they have learned through the activities they did. In addition, working in groups with other children and the teacher also makes learning and doing more enjoyable and effortless for children and develops capabilities such as planning, organizing, teamwork, observing, recording, and documenting.

Thus, through a series of connected activities designed to provide holistic understanding of water in the school campus, Earthian furthers the learning of the concepts and other objectives within the curriculum.

Productive work as pedagogy

Work and education is usually associated with employment and vocational education. Productive work is often seen as something that furthers production (of goods and services) and vocational or work education as acquiring knowledge and skills that provide employment. However, productive work can also be seen more broadly as any practical, hands-on activity with social utility. When seen this way, one can see that there are links between the ideas of work and education and the activity-based learning approach that Earthian has used.

The activities in Earthian are designed to bring about an experiential understanding of the local context on an important domain like water. They generate awareness about the needs and the gaps around water, its interconnections with other domains and help build some skills that may be useful to address the needs and gaps. This promotes learning and interest around a topic that is socially relevant.

The essential idea behind the design of the Earthian activity is that of experiential learning or learning by doing. This is also the underlying principle of 'work and education'. The experience of actually doing tasks helps internalize learning and makes the impact deeper and long lasting in a way that only experiential learning can.

Thus one can say that Earthian tries to bring about a mix of knowledge, skills and values acquisition through productive work. This connects well with the motto of 'work and education' – that of bringing the head, heart and hands together and making learning more integrated. In textbooks and classrooms, we often compartmentalise knowledge into disciplines and teach these in isolation from one another and assess learning through pen and paper examinations. But life is integrated and goes beyond the disciplines and it is in applying to life that knowledge becomes real. Such grounded and contextual learning activities, we feel, will help children develop the ability to integrate what they learn in different disciplines and apply it to life.

We would like to emphasise that this kind of teaching-learning does not negate the need for textbooks and other resource materials or the need to learn disciplines. Such activity-based learning complements and concretizes the knowledge and understanding acquired from textbooks and disciplines.

Looking ahead

If a simple set of activities on water can have a positive impact on children's learning, it seems reasonable to assume that expanding the scope and scale of such a learning process would be hugely beneficial to many more areas of learning. Such project-based integrated activities would make learning more grounded, contextual and real for our children, and thus more effective, by promoting all-round development of knowledge and skills, it also provides ample opportunities for the teacher for Continuous and Comprehensive Evaluation (CCE). In fact, the time set aside for CCE could be effectively used for such project-based learning activities.

Facilitating such a learning activity in class does put an additional demand on the teacher. The teacher will need to make a shift from going only 'by the book' and identify projects and experiences that can provide integrated learning for her students. The teacher would also need to help the children plan and execute the project, help them find effective ways of doing the tasks and ensure that the concepts and skills to be learned are indeed assimilated and practiced by the children. Thus, the teacher is a critical partner in making such a program a success.

In Earthian, the teacher is supported in this process through resource materials such as the water activity booklet and the resource book. Earthian plans, in the coming years, to develop more activity-based programmes on water and other themes. As part of its second phase, the Earthian programme also works with selected schools to build teacher capacity to deepen this kind of pedagogy. We hope to spread and share the learning arising from these experiences with schools, teachers, the education system and the larger education community.

The National Curricular Framework (NCF) 2005 already encapsulates such ideas. In fact, Earthian derives its inspiration from, among other things, the habitat and learning position paper of NCF 2005. We are also confident that there are many teachers and schools and initiatives where such ideas are already being practised. However, for these ideas to be integrated into the education system, there is need for widespread systemic reform in the areas of in-service and pre-service teacher education, textbooks and other teaching and learning materials and authentic CCE. These should aim to provide more space and opportunities for integrated activity-based teaching-learning in schools. This will make learning more integral, contextual and enjoyable for the teachers and the learners.

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Sreekanth and Shaheen are part of Wipro Applying Thought in Schools, Wipro's social initiative in education. They are part of the core team which designs and runs Earthian, Wipro's sustainability education program for schools and colleges. They may be contacted at sreekanth.sreedharan@wipro.com and shaheen.shasa@yahoo.com



Green Schools Program: An Out-of-classroom Experience

Sumita Dasgupta



During the past 25 years or so we have seen environment appear in different avatars in India's education arena, sometimes as a handmaiden of 'mainstream subjects', wedged between pages of chemistry or history text books or at other times as a common theme of all extra-curricular activities as taking 'nature walks' in local parks to making scrap books on local fauna. But never, until now, was it a part of the formal grading system. Environment ceased to be a sideshow after the country's apex curriculum setter and the two dominant education boards decided to allocate scores to it in the crucial school leaving examinations. In a scenario where every single mark is viewed as a stepping stone to a future career, there could not have been a more significant move especially when it came loaded with some more interesting conditions. The assessment, as per the current guidelines, will not be based on the conventional 'study-text-books-write-examination' mode. Grades will depend on how active the examinee has been 'on the ground'.

Predictably, there has been a flurry of action ever since this diktat was passed. Treating environment as a living, breathing, and 'doing' subject is not a task that the teachers have been trained to perform. There is no ready resource available either or text books or even reference books that can fit into this mould. But as always, the teachers have resiliently risen to the occasion and come up with some remarkable ideas to turn environment into a tangible (grade-able) entity.

Green Schools Programme¹ (GSP), a flagship initiative of the Delhi-based Centre for Science and Environment (CSE), attempts to lend the teachers a helping hand because it believes that this particular class is of paramount importance. Environment as a topic is being introduced with a fresh perspective to the future custodians of the Planet. It cannot, under any circumstances, be allowed to degenerate into yet another 'boring' subject. So GSP has been designed as a tool to learn Environment 'by doing' which prods students and teachers to come out of classrooms to do things—count, weigh, measure, explore and analyse. Accompanied by the GSP Manual, a do-it-yourself hand book on how to audit water, air, energy, waste, and land, within school premises, GSP introduces a new methodology for assessing the performance of the school community as a manager of these natural resources. The end product is a report card, which CSE helps the school community to prepare, quantifying its own achievements, as well as identifying shortfalls that require awareness and attention. The audit does not require any special equipment or funds. CSE teaches the schools how to collect data using simple techniques that are anyway a part of a school's daily routine. The activities can, in fact, be used as an assignment for any of the subjects in the mainstream curriculum.

Through this process GSP attempts to drive home the message that the connotation of the word

¹At present, around 30,000 schools, representing 22 states and 1 Union Territory are a part of the GTGSP (Gobar Times Global Schools Program) network. CSE has forged formal partnership with state governments of Andhra Pradesh, Himachal Pradesh, Delhi, Punjab, Madhya Pradesh, Kerala, Sikkim and Uttarakhand. As per this alliance, the State nodal agency invites CSE to train 50-60 master trainers. These GSP-trained personnel then train teachers and students at district and block level to conduct environmental audit. In most of these States the GSP manual has been translated in the regional language, to ensure that teachers at every level can use it optimally. This process has helped in carrying the GSP message to every corner of these States. Participation from schools located in remote regions has multiplied each year. In other States, the GSP team partners and trains small/local NGOs and educational institutions who have a network of schools operating under them. Among the partners, four States — Delhi, Himachal Pradesh, Sikkim and Andhra Pradesh — have constituted Chief Minister's GSP Awards, which are given to the top performers in the State. The purpose is to acknowledge and motivate a larger number of participants, and also to ensure that the State agencies are actively involved in this initiative with a long-term plan in place. GSP has also been adopted by the governments of Sri Lanka and UAE as a part of their National Environment Curriculum.

'environment' is not limited to trees, birds and tigers. It includes all the key components that make up a human being's life and livelihood. The end product is a report card, which CSE helps the school community to prepare, quantifying its own achievements, as well as identifying shortfalls that require awareness and attention.

To wrap up, CSE organizes an annual event called the Gobar Times Green Schools Programme Awards Ceremony. Here, top performers from across the country are rewarded for their enterprise and innovative skills. The objective is to acknowledge efforts made, and also to encourage more institutions to come forward and take part in this movement. The day is celebrated as a festival, when school children from every part of India are invited, not only to witness the award giving ceremony but to take part in painting competitions, perform in street plays, watch films and mingle with each other. Every year at least 5 to 8 schools out of the top 20 belong to the rural sector.

But is GSP working?

The impact of GSP on the school community is apparent if one compares the performance of the participating schools with each passing year. Here it is important to note that more than 50 per cent of them repeat the audit process year after year. Clearly, their objective has been not just to win a contest, but to gauge if they have been able to improve their score cards and become better managers of environment.

Changing trends and perception.

In 2006, after the first set of audit reports were submitted and analysed, CSE identified the following trends:

- environment-related programmes are still considered to be extracurricular. No structured approach to bring about actual changes in lifestyle or practices are evident yet.
- schools are willing to adopt innovative methods to conserve energy and water. But follow-up process to measure and quantify the impact do not exist.

For instance, 75 per cent of the participating schools had installed rainwater harvesting systems, but only one was using its actual potential. For the others it was a showcase model - set up and then forgotten.

95 per cent of them were engaged in waste management practices, like vermicomposting, recycling paper. But only 5 could record how much per capita waste was actually being generated in their premises.

In 2007 there was a remarkable shift in attitude and approach in the following areas:

- schools had mastered the art of auditing within one year.
- their data collection, tabulation, and analysis was outstanding
- assessment of impact of resource management practices like rainwater harvesting, recycling of water and waste were far more precise, structured, and accurate.
- the students had obviously been involved in every step. There was a sharp increase in awareness level.

For instance, every school had assigned student groups to weigh waste. Audit teams included sweepers, gardeners, waste-dealers. Students were using spring balances, hand balances and weighing machines and could tell CSE what types of waste were being produced and how much, each day.

In 2008, the commitment and perseverance of the participants encouraged CSE to start a new category of awards, called the Change Makers. These were given to schools which had been able to achieve basic, but long-term changes in the mindset and lifestyle of not only the school community, but also that of parents and the neighbourhood. For instance, a school in South Delhi, recorded an 8 per cent shift in commuter practice, with students and staff opting for public transport (some provided by the school) in place of individual cars or two wheelers. The parents had been involved in this decision and they were partners in this initiative.

Since then the audit process has matured into a very effective medium to assemble authentic data on status of resources and to identify trends. It clearly indicates what needs to be done, where and how. It can now, therefore, be used by administrators to gauge whether a particular system or policy has yielded results or not.

For instance, Delhi schools have made major gains in

energy audit because of CNG-run vehicles. This policy has helped them to keep emission contribution to a minimum as compared to the other states. Their scores, however, take a plunge sometimes, because of their growing dependence on diesel-run generators, reflecting the city's power situation.

Why GSP?

It is now evident that this audit is universally required, especially in schools where resources are scarce, where it is needed to ensure that basic needs are met. In schools where there is a surfeit, the audit is required to prevent wastage.

The GSP can, therefore, be used by the school authorities as a tool for two purposes. First, to set up practical, achievable 'green norms' for Delhi's schools; then to take a step further and enforce these norms in schools in the form of green policies and infrastructure.

But are the schools actually doing it on the ground?

To answer this I shall share with you a letter we recently received from one of our veteran school partners. It says, 'As you are well aware, our school is located in one of the driest zones of South Delhi. Every summer we are forced to spend huge sums of money to buy water at commercial rates. After we were introduced to CSE's school programme, we were determined to reduce our consumption. We have finally found a way to do it. We have converted all eighteen male urinals to waterless units a step that would save 1,70,000 litres of fresh water per year. Each unit costs us Rs.2500/-. The cost of installation can be recovered in the first month itself through water savings.'

From wasteful but guilt-ridden consumers to savvy yet cautious resource managers, the GSP gurus have come a very long way! It is truly a heartening development. In the global arena, environment now occupies center-stage. It plays a crucial role in shaping economies, influencing policies and deciding the fate of heads of states. Internally, it is a priority issue in the agenda of every sector - from industry to agriculture. So it is time that we got the most important segment of the population, the students, on board in this discourse. It is now imperative to build up skills, and deepen their knowledge base in these issues. Programmes like

the GSP provide them the platform to express their views, as well as an opportunity to experiment on the ground.

Government Girls Senior Secondary School, Deorali, Sikkim: They have given a fresh angle to the entire GSP audit. They have linked it to health. The girls in this small school, perched on the hills of North Sikkim, ran a very active health club till 2005. They provided first aid to students and staff, and supervised general cleanliness, till they got introduced to GSP. These smart citizens of Sikkim quickly realized that managing solid waste produced in the school, maintaining clean, water efficient toilets, making sure that the water they drank was safe, were stuff as critical, if not more, for good health as medicines and band aids. So the health club became a hub of environment activities. And the school got healthier!

Government Senior Secondary School, Makreri, Himachal Pradesh: Yet another participant from the mountains. This time the scene is set in Himachal Pradesh, and the location is even more remote. But being tucked away in the interiors, 75 km away from the nearest district headquarters has never been a dampener for this supremely energetic school community. It had won several eco awards for its work in preserving local biodiversity - for keeping a seed bank for traditional grains and cuttings of local plant species. What GSP gave these already eco wise people was a reminder that environment is not only about trees, plants, animals and seeds, but also about water, about energy and about waste; that in a State as focused in micro-hydel projects as Himachal, it was essential to begin practicing rainwater harvesting in order to ward off the impending water shortage in farmlands as river beds dry up. And once they were reminded, there was no stopping them. The audit teams lobbied hard with the local panchayat, mobilised resources and ensured that the structures were in place, not only in the school but in the village as well.

What is GSP's future vision?

CSE's objective is to forge GSP partnership with every state government, and to help set up CM-GSP awards in each of them. It is now ready to take up the following responsibilities:

- Build capacity among teachers, students and school administrators through workshops.
- Equip and empower schools, both in the rural and urban sectors, to set up practical, achievable 'green norms'. And then help them to implement these on the ground as green policies, to be practiced in the school premises.

- To enable the evolution of an alternative curriculum. Already GSP is being used by several schools as a tool to conduct Continuous and Comprehensive Evaluation (CCE) of mid and senior level students. But GSP's primary challenge has been to provide the students an opportunity to learn about environment not by memorizing yet another text book, but by 'doing'. The new curriculum will attempt to drive home the message that the connotation of the word 'environment' is not limited to trees, birds and tigers. It includes all the key components that make up a human being's life and livelihood.

Sumita began her career as a mainstream journalist, covering any issue the assignment in hand demanded, from politics to fashion. Her area of interest got more focused after joining Centre for Science and Environment, as a sub-editor in Down To Earth, the Centre's fortnightly magazine. She later contributed as a Specialist writer on Bio-diversity, and took charge of the organisation's Natural Resource Management Unit. But the role of a writer always appealed to her more than that of a researcher. So when she was offered the post of Programme Director, Environment Education Unit, she accepted it immediately, because it allowed her to combine roles - to launch and steer GSP, CSE's maiden education initiative, and be the Editor of Gobar Times, a monthly magazine for students. At present she works as a content consultant, specialised in issues related to the development sector. She may be contacted at dasgupta.sumita@gmail.com



Some Useful Resources

Sln.	Organisation	About the Resource	Online link of resource
1.	Development Research Communication and Services Centre (DRCSC) http://www.drcsc.org/aboutus.html	Creative lesson plan series on Tree, Insect, Medicinal Plant, Water, Rice, Bird, Fish, Vegetable, Waste, Energy and Local Market – a series for the teacher and educators based on the work actually done by children in rural West Bengal	https://sites.google.com/a/apu.edu.in/work-in-schools/home/list
2.	Earthian http://www.wipro.org/earthian/index.php	A learning resource on sustainability and water	http://www.paryavaranmitra.in/Earthian-Small%20Final_High%20res.pdf
3.	Centre for Environment Education (CEE) http://www.ceeindia.org/cee/index.html	A manual compiling environment education games (Green games) that can be used in schools to acquire knowledge, values, and skills	https://sites.google.com/a/apu.edu.in/work-in-schools/home/list
4.	Uttarakhand Seva Nidhi http://www.ueec.org.in/school.htm	Environment education course text books for hilly areas (class VI-X)	https://sites.google.com/a/apu.edu.in/work-in-schools/home/list
5.	Gujarat Vidyapeeth, SADRA and Ardhendu Chatterjee	A lesson plan based on Biodiversity developed with the help of Mr. Ardhendu Chatterjee during a national workshop in Gujarat in 2013	https://sites.google.com/a/apu.edu.in/work-in-schools/home/list
6.	Srishti School and Biome Trust	A toolkit for introducing children to water and sanitation issues in and around their school aiming for behaviour change	https://www.behance.net/gallery/1430553/Agents-of-Change-Spreading-water-literacy and https://sites.google.com/a/apu.edu.in/work-in-schools/home/list

Continued...

Sl.n.	Organisation	About the Resource	Online link of resource
7.	Anand Niketan http://www.nayeetaleem.org/	Methi ki Kheti- a lesson plan for academic linkages with growing Methi in school gardens	https://sites.google.com/a/apu.edu.in/work-in-schools/home/list
8.	NCERT	Project books on Environmental Education	http://www.ncert.nic.in/recent/env_edu.html
9.	Centre for Science and Environment (CSE) 's green school programme http://www.cseindia.org/taxonomy/term/20071/menu	A DIY manual for schools on how to audit waste, water, energy, air, and land within school premises	http://pondycan.org/wp-content/uploads/2014/12/CSE-Green-School-Manual.pdf
10.	Taleem Net (Nyla Coelho)	A resource book on organic farm-based curriculum for schools	http://multiworldindia.org/wp-content/uploads/2009/12/Rural-Curriculum_India_1-of-8.pdf
11.	National Gardening Association http://assoc.garden.org/ Gardening with kids	Gardening with Kids provides tools and resources that help teachers and community leaders use gardening as a method to enhance education and foster environmentally responsible adults. Lessons, funding and a wealth of other information is provided at http://www.kidsgardening.org/ Some of the curriculum material may have only paid access.	http://www.gardeningwithkids.org/

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Last date for submission of applications: May 25, 2015



Azim Premji
Foundation



We invite you to join our Early Childhood Education Initiative at Medak District in Telangana

The initiative works to improve Early Childhood Education in Government Anganwadis (ICDS). It includes:

- Improving teaching-learning by building capacities of Anganwadi workers, developing appropriate curriculum and learning resources
- Working with community members and parents to develop the Anganwadi
- Research on issues of Early Childhood Education

Eligibility

- 5 years of relevant experience. Candidates with experience as a teacher, teacher educator in pre-schools, or as a researcher working with young children are encouraged to apply
- Post-Graduate degree (MA, MSc) in Psychology, Human Development, Child Development or PG Diploma in Early Childhood Education

Azim Premji Foundation has a vision to contribute to a **just, equitable, humane and sustainable society**

For more information and to apply online visit: <http://www.azimpremjifoundation.org/careers>
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No. 134, Doddakannelli
Next to Wipro Corporate Office
Sarjapur Road, Bangalore - 560 035, India
Tel: +91 80 6614 4900/01/02 Fax: +91 80 6614 4903
E-mail: learningcurve@azimpremjifoundation.org
www.azimpremjifoundation.org

Also visit Azim Premji University website at
www.azimpremjiversity.edu.in



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