Voices of Teachers and Teacher Educators

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About the publication

The launch of the journal 'Voices of Teachers and Teacher Educators' is an initiative of the Ministry of Human Resource Development (MHRD) to highlight the vital role of teacher education in India, as the country is poised to provide quality education to all its children, irrespective of gender, caste, creed, religion and geographies under the Right of Children to Free and Compulsory Education Act (RtE), 2009. The large influx of teachers necessitated under RtE represents the biggest opportunity to bring fresh life into schools for decades to come. The challenge is to enhance the role of teachers in shaping the social transformation India is witnessing, as well as have a long lasting impact on the quality of education, also making it significantly more equitable. Teachers and all those in the system need to recognize that their ownership and voices are important and that they can and do learn not only from their own experiences but also from each other through collective reflection and analysis. The publication attempts to lend voice to teachers, their educators, researchers, administrators and policy makers in the varied institutions: Schools, CRCs, BRCs, DIETs, IASEs, CTEs, SCERTs etc., and make visible their engagement in accomplishing extraordinarily complex and diverse tasks that they are expected to perform. Contributions are welcome both in English and Hindi and there are plans to produce the journal in a multilingual format in the near future.

Call for contributions

This publication is for all of us: teachers, teacher educators, administrators, researchers and policy makers. It is to provide a platform and also to build a network for our voices, ideas and reflections. Since the idea is to make this journal reflect all our voices it would only fulfill its purpose, if we contribute to it in as many ways as we can. We look forward to all of you contributing with your experiences, questions, suggestions, perspectives as well as critical comments on different aspects of teacher education and schooling. This could also be through comments and reflections on the current issue. Your contribution could be in the form of articles, reports documents, pictures, cartoons or any other forms of presentation that can be printed. We look forward to your inputs to make this journal truly reflective of our voices. It is proposed that this be a quarterly publication. We would like to receive contributions for the next issue by 30th April, 2013. We also look forward to comments and suggestions for improvements of the publication to make this a participative endeavor and improve its quality.

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Editorial

Editorial

Over the last few years, there has been a slow if not sure consensus that teacher education is important. This realization has translated to frenetic action at local, state, national and international levels. The cumulative neglect of the teacher education sector over the last two decades is not going to be easy to redress – more importantly, there is need for collective understanding of what teacher education is all about in all its complexities. Currently, teacher education is largely described in terms such as pre-service, in-service, modules, 3-day, 5-day, 10-day trainings and so on. The debate on what constitutes 'quality' teacher education invokes sharp reactions and responses, yet, gradual consensus does seems to be emerging on the primacy and agency of the teacher, her self-respect, commitment to child-centred rather than teacher-centred teaching-learning, unprecedented interest in pedagogies and most of all, a gradually emerging agreement that the purpose of education is all children learning - meaningfully and effectively and that for this to happen, higher education needs to step in, with research-based academic support. In this issue, we attempt to present a panoptic on these efforts on teacher education.

At the national level, for the first time, the MHRD has constituted Joint Review Mission for Teacher Education to assess, in a collaborative mode with the States, the progress made in teacher education, its linkages with the school system, and the nature of research based academic support teacher education draws on. Hopefully, this will provide the necessary lens to re-define state initiatives in teacher preparation. Meanwhile, States have also been independently engaging in revitalizing teacher education institutions, notably the SCERTs. Following the account of Andhra Pradesh in the first issue, we present how Chattisgarh has shaped its SCERT. Tamil Nadu has initiated a radical shift in school and teacher education through the Ability Based Learning model, and we explore a State teacher educator's view and action on this process. We reflect on teacher preparation in general through an article on a possible process framework.

The E9 is a forum of high-populated nine countries, which formed to achieve EFA goals through south-south cooperation. The "E" stands for education and the "9" represents the nine highly populated countries: Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria and Pakistan. The E9 countries met in New Delhi for a Conference on Quality, Inclusive Education for All under the aegis of UNESCO. Teacher education challenges formed a key part of the deliberations and the joint resolution. A summary of the conference forms part of this issue.

The substantives of teacher education has to emerge from the process of teaching-learning and materials - two distinct but inter-related dimensions that converge inside a classroom. We explore these with an autobiographical account of a practitioner as he looks back on his journey in Mathematics that began in his school days with his teacher. Also in this issue is an article that explores conceptualizations of the study of science, specifically optics and the (mis)-conceptions that arise out of ritualized accounts in science textbooks. It is interesting that while for one author, the deeper engagement with existing materials was the route to life-long passion for Mathematics, another finds how materials themselves serve to act, as Bourdieu states, as a 'doxa' of scientific understanding – the unstated, taken-for-granted assumptions or the going along with what we perceive as acceptable sense behind the ideas we accept. The report on art education as pedagogy further questions our assumptions while we translate theory into practice.

It is pertinent to bring to the forefront teachers as persons, for whom so much teacher education is happening. One thing can be said for sure, they were all young men and women when they began to teach for the first time, with youthful aspirations, some tried and broken, others sieved out of more competitive options. Nevertheless, for the first time teachers engaged with children in a classroom, we can confidently say that they pour into this experience, the very best of themselves. What happens to these young men and women? What happens to them after that *is* the central task of teacher education.

'Voices' is entirely dependent on the contributions of teachers, academics, teacher educators and activists. We invite articles on classroom practices, curricula, teaching-learning materials, pedagogic practices, teacher education, snippets, reports, innovations and reflections of teachers, teacher trainees, and researchers. Please email them to: rajan.janaki@gmail.com and hardy.dewan@gmail.com.

Sheshagiri K.M.

Channakeshava

Abstract

This autobiographical article details the impact school teachers can have in generating abiding engagement of students with disciplines, in this case Mathematics, that comes out of the teacher's thorough grasp not just of content but of how Mathematical ideas developed, the questions of the times, the people involved in the subject's development. Complex concepts begin to look more graspable to an inquiring young mind that absorbs the passion for Mathematics that the teacher exudes.

Beginning

Let me begin this story with my school, the Baldwin Boys High School in Bangalore, which I joined in 1978. The school was already 98 years old then we celebrated our hundred years when I was in grade 6. But I would meet Channakeshava (Channa, as he was affectionately called), the Mathematics teacher and the main protagonist of this story, only in 1983 in the eighth grade.

There was nothing unique about my mathematical experiences up to the seventh grade. We had sincere and hardworking teachers teaching to the syllabus and preparing us for the exams. I don't recall being excited about math either. Mrs. Thomas, our class teacher in sixth was always pleasant, never lost her patience and once told me that she could solve all the problems in complicated looking 10th standard ICSE textbook by O. P Sinhal. That complex looking book which my seniors brought to school every day giving rise to both fascination and fear- I could not but help admire her for that.

Till grade 7 or so, mathematics seemed to mean that one just had to 'solve' problems and get the right answers and it involved the occasional shout and spank that one received at home and school if one got the wrong answers. Little did I realize then that the world of mathematics was full of strange creatures (such as rational, irrational, surreal, transcendental, imaginary and complex numbers, and other such creatures) which were related to each other through even stranger relationships. Beautiful relationships, many mathematicians would say. It was a world of its own, which could hold fascination all one's life.

Introduction to beauty in Mathematics

I reached the eighth grade in 1983. It was Channakeshava's first class with us in June that year and it had very little to do with our syllabus and textbooks. He could have so easily started off with the first chapter, and we would have plodded through, as usual. Instead, he wanted to begin by showing us 'beauty' in mathematics (This, I say in hindsight. It wasn't so obvious then). So he posed the following question on the blackboard:

142857 X 1?

This was easy. Next, he asked:

142857 X 2?

While we all got busy with the multiplication, he quickly wrote the answer – 285714. Then, he asked again:

142857 X 3?

428571 is the answer, which he had written down as if he knew it all along while we were busy multiplying! Then he went on to show what happens when 142857 is multiplied by 4, 5 and 6. Interesting stuff was emerging:

142857 X1 = **142**857
142857 X 2 = 285**714**
142857 X 3 = 4285**71**
142857 X4 = **571**428
142857 X 5 = **7**14285
142857 X 6 = **857**142

What we saw was a 'cyclic permutation' of the number's original digits even as we multiplied it by 2, till 6. It was difficult to discern *a* pattern in the manner the digits got shifted — sometimes one digit got shifted, sometimes two, and sometimes three but in all cases the ones getting

shifted were consecutive digits. But what was startling was that it was the same number whose digits got shuffled around. Such numbers are called 'cyclic numbers', Channa told us. And mathematics is full of such curiosities, he added, which can be studied by just about anyone. In conclusion, he asked: what happens when we multiply 142857 by 7? We wondered if the original number would get recycled again. But no! What we got instead was 999999! This was puzzling, indeed! While we were soaking it all in, Channa just smiled.

That is how we were introduced to the beauty of mathematics in grade 8. I use the word beauty because it hits you, as a beautiful sunrise would – everything appears to be in place and it cannot get better than that moment. You are left speechless. In mathematics, beauty lies in the patterns that unfold, like in the above example. Students of mathematics can access and marvel at this beauty, provided their teachers make an effort to take them on this journey. I was fortunate in this respect.

More beauty
Let me present mathematical beauty through another example, perhaps the most famous of them all.

It is acknowledged that among the most beautiful relationships or patterns in mathematics is perhaps the Euler equation (after the great Swiss mathematician, Leonhard Euler) $e^{i\pi} = -1$. To put it another way: $e^{i\pi} + 1 = 0$. Each of these numbers: e, i, π(Pi) and 0, are unique numbers which keep recurring in mathematics. Further, note the number 'e' and π are what mathematicians would call as 'irrational numbers' — simply put, an irrational number is one which has a decimal/ fractional portion that never ends. And 'i' is another equally intriguing number (called the imaginary number) which is the square root of minus 1. This is like asking 'What number when squared (multiplied by itself) gives – 1?' This 'i' is neither 1 nor minus 1 and is therefore called imaginary.

Now let us visualize the Euler identity: $(2.7182818284\ldots)^{(\sqrt{-1}) \times (3.14159265\ldots)} + 1 = 0$

Note that 'raising one number to a certain power' (which is what we do in the above expression) simply means this: If you raise a number 'a' to the power 'n', it means you multiply 'a' by itself 'n' times. So if we say a^3, it would look like this: a x a x a.

There is something very intricate that happens with the Euler identity which we lay persons can only intuitively grasp. You have this irrational e which when raised to the product of another irrational (π) and the imaginary i, gives –1. Then you bring this –1 on the left side and that leaves us with zero on the right hand side. What beats me is *how* this happens. First of all, you have this e and π whose decimal portions are never ending or recurring as even the most powerful supercomputers of our age have found. If one can find a way of adding them, it might result in another irrational number. Ditto, if one is subtracted from the other. If they are multiplied by each other, we might end up with yet another irrational number. But if e is raised to the power of the product of i and π then the strangest of things occurs – the infinite strings of digits *just disappears*, leaving us with –1! And when this is added to +1 as we see in the Euler identity, we are left with *nothing*!

It struck me that the Euler identity in many ways is like 'alchemy', or so I thought then, sitting in that Chemistry lab. Our chemistry teacher was demonstrating how different acids/liquids react with each other. There was this colourful liquid which was mixed with another colourful liquid and Voila! The mixture became colourless! There was a collective gasp in the room, and since fairly large glass containers were used to pour out these liquids, the entire exercise looked spectacular. Of course, we did not know enough of physics or chemistry to answer why this happened.

The Euler identity is similar in terms of mathematical alchemy. I'm tempted to quote Benjamin Pierce the American mathematician:

> "Gentlemen, that *($e^{i\pi} + 1 = 0$)* is surely true, but it is absolutely paradoxical; we cannot understand it, and we don't know what it means, but we have proved it, and therefore, we know it must be the truth."

You could spend your entire life unravelling these relationships, like mathematicians did. What was even more fascinating, as I realized much later in my explorations of physics, were the intimate connections these abstract relationships had with the ordering of the natural world. Surely, there is something fascinating here and I'm not sure if even the best mathematicians have understood why this is so. Isn't it all beautiful then, like the cyclic number that Channa showed us? Apart from offering us a glimpse of mathematical beauty, Channa also took us along on a fascinating journey of the history of mathematics, including its many paradoxes and famous solved and unsolved problems.

Channakeshava

Back to CK: There was more to come that year and in grades 9 and 10. There wasn't much exploration of numbers after that session on cyclic numbers - it had to be business as usual in a school that prided itself on exam results. But there was a definite *difference* in the way we were taught mathematics. First, Channa came across as very calm and self-assured, both as a human being and teacher. We couldn't get close to him, and there was no question of getting friendly with him. He ensured that there was always some distance between us and him – fair enough, I think, given that he may have been in his late forties or early fifties then. But when it came to learning math with him, it was sheer fun. With his partly bald head and bespectacled face and his immaculate suit, he looked quite the archetypal mathematician himself.

When I look back on those three years that he taught us, I realized how grounded he was in the

> *This, I now believe, is a pre-requisite for every teacher of the subject - a teacher of mathematics cannot limit his or her teaching to some sharing of procedures to solve problems but share the real excitement that comes from exploring patterns and relationships in the mathematical world. And he must do this in a manner that children can understand. While access to good reference materials would certainly help, the fundamental requirement is curiosity - how can one convey excitement to the child when one is not generally curious…?*

realized that he was indeed an avid explorer of the mathematical world.

There was this unmistakable gleam in Channa's eyes whenever he conveyed something fundamental or profound. When he emphasized some deeper aspect of the topic at hand, his mouth would open a bit wider than usual and he would pull his lips backward to make a point — like I remember when we first heard the Latin phrase *Quod Erat Demonstrandum* when we were grappling with proof in geometry. Q.E.D, literally meaning 'What was required to be proved' is what one says when one has demonstrated a proof. A proof is a kind of achievement in the mathematical world through which one demonstrates underlying patterns and relationships between numbers, spaces and the like. Everyone was attentive in Channakeshava's class, from the first to the last bench because we knew that we would end up learning *something*. The other unique element of his teaching was his impeccable running handwriting and use of blackboard space. I have not come across another teacher who used the blackboard as effectively and as beautifully as he did. His handwriting was a visual treat, not flamboyant but clear and pleasing to the eye. The sense of proportion he had when using the blackboard was just amazing. He would clearly demarcate areas on the blackboard – for instance, for drawing diagrams, for arguing, and writing down the steps of the analysis, and for rough work or calculations.

Proof

We also encountered the idea of the theorem for the first time in geometry. We had earlier learnt that most common property of triangles – that the sum of the three angles of a triangle always adds up to 180p (Well, I later realized that it doesn't, always, and depends very much on what kind of surface you draw the triangle on – this kind of thinking has led to the development of different kinds of geometries, such as Riemannian and Lobachevskian geometry, for instance.). 'How do you know this is true?' Channa had asked? 'Measure and see and you will get 180p !' we had said. 'How many triangles should I draw and measure?' This question stumped us a bit and I remember that we didn't

The geometry we have studied in school is called Euclidean, after Euclid, the great Greek geometer who lived more than 2000 years ago. His brand of geometry - Euclidean geometry is what works on flat surfaces.
In his Elements, Euclid had proposed five axioms on which the whole of his Euclidean geometry rests!

need proving but from which all of Euclidean geometry flowed. Later, one realized that there had to be certain starting points anyway without which, one couldn't even move forward.

I'm recounting all of this because CK shared this fascinating history with us. Imagine — we were learning something that was thought of two millennia ago and put down in a book then! In the coming months and years, we would prove many theorems, in geometry and algebra and trigonometry, and in algebraic geometry. I enjoyed the study of theorems and their proofs only intermittently and kept wishing that CK would tell us more and more stories instead. There were days when the proof of a theorem would just appear effortlessly and then there were days when one would struggle. Channa would go on, as enthusiastically as ever, adorning blackboard space with these eternal theorems and their mind bending logical proofs!

Years later, when I read that great book *Men of Mathematics* by E. T Bell (the title can be questioned and one can ask 'Where are the women mathematicians…?') it struck me when he said that the Euclidean method that insisted on proof may have actually hampered the development of mathematics by at least two thousand years. On the other hand, if mathematicians had followed the unfettered thinking of Archimedes, one of the three greatest mathematicians ever (along with Newton and Gauss, and, I would add, our own Ramanujan) that Bell identifies, the age of modern mathematics (and with it, science) could have occurred two millennia earlier. I wonder what position Channa would have taken? Would he have taken Euclid's side or would he have plumped for Archimedes…?

agree on any one number. In fact, any number would have been arbitrary – 10, 50, 100, 1000…? 'In any case', Channa said, what if the 1001st triangle's angles *do not* add up to 180p ?' There was no response from the class.

'For this reason, we have to *prove* that *no matter what*, the angles of a triangle add up to 180p .' And so we went about proving this elementary theorem and learnt along the way that the word 'theorem' is nothing but a statement claiming such and such a thing, which has a proof that is generated using deductive reasoning – this is something like saying 'If A, then B'. Now, all these theorems in geometry that one encounters in school (and usually breaks one's head against) rest on certain foundational statements called *axioms.* In his *Elements,* Euclid had proposed five axioms on which the whole of his Euclidean geometry rests! I had difficulty in accepting these axioms as 'self-evident truths' which did not

Famous problems we discussed
As we journeyed with Channa, we were often treated to snippets from the fascinating history of mathematics. Some years later, when I took to teaching mathematics at The Valley School in Bangalore, I realized how well he had employed the history of mathematics as an effective tool to make the subject absorbing. In fact, it dawned on me that this was the cornerstone of his teaching and was perhaps one of the most effective ways in which one could fire the imagination of the

learner. That there were hundreds of stories of mathematical discovery, many of them rooted in daily life problems and that mathematicians were as human as anyone else, hadn't occurred to most of us who had by then, reconciled ourselves to our highly developed math phobias.

The Seven Bridges of Konigsberg, the Barber's Paradox, Fermat's problem and the Four Colour Problem are among the most interesting and intricate problems of mathematics which have excited the best minds for generations. Attempts at their resolutions have given rise to entire branches of mathematics. Channa told us those fascinating stories, many of which I remember them to this day. I passed them on to my students in the best manner I could.

First, the 'Seven Bridges of Konigsberg'. I'm not sure which grade it was, may be 9th or 10th, around the time when we were supposed to learn the idea of matrices. Any teacher would have plunged headlong into the subject and would have introduced matrices as 'an array of numbers…arranged horizontally and vertically…and these are the rules for their addition and multiplication…' This would have been followed by boring problem solving from the exercises in the textbook. With Channa, that was not to be. He simply had to get to the root of the idea and share the excitement of his explorations with his students. And that is how we were treated to the 300 year old 'Seven Bridges of Konigsberg' problem. I do not remember the connections that were made between the Konigsberg problem and the idea of matrices in mathematics, but I do remember we spent a couple of periods discussing this puzzle that originated in daily life and informed the development of new areas of mathematics such as graph theory, which finds wide applications.

We spent two classes on the Konigsberg problem, trying to draw our myriad routes across the seven bridges only to be stumped in the end. And then, CK told us that Euler stated that the Konigsberg problem could *never* be solved. The actual proof came much later, in 1873 by one Carl Hierholzer. But the thinking that went into Euler's reasoning spawned an entire new branch of mathematics called Graph Theory which was in turn

Briefly, the Seven Bridges problem originated in the town of Konigsberg (founded in 1254 A.D) in Prussia (Kaliningrad in modern day Russia). The town itself was made of four land masses that were connected to each other and the mainland by a network of seven bridges built on the Pregel River which ran through Konigsberg. The seven bridges (not all of them exist now) were named 'Blacksmith, Connecting, Green, Merchant, Wooden, High and Honey', and the problem, which was attacked (actually, negatively resolved) by the great Euler in 1736 was to walk through the entire town of Konigsberg in such a manner that one would have to cross each bridge once and only once and finish at the starting point. The story goes that when people of Konigsberg took their leisurely walks on Sundays and used the bridges to reach different points in the town it occurred to them that they could actually generate a puzzle based on the bridges. Thus, the above problem was posed.
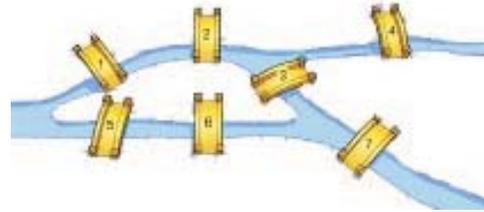
intimately connected with the idea of Matrices. It also preceded the development of another branch of mathematics called Topology, Channa said. He did not of course go into details and enlighten us about these connections, nor did we have the time to actually see how Euler resolved the problem (the proof is not *so* difficult to understand, as I discovered later, but during Euler's time, it must have been breaking news!). When I look back today, it amazes me to even think that a Math teacher could have thought so much in depth, to present just one of the myriad topics we studied at school. How much he must have read and reflected, before presenting us the problem, and linking it to what we had to study as part of our course!

Likewise, we had a fascinating discussion about the Barber's Paradox, when Channa generally talked about paradoxes in mathematics. At that stage, I remember that we were beginning to discuss the idea of Sets. Channa walked in one

day and asked if we knew what a paradox was. When there was silence in the room, he went on to explain that a paradox in mathematics occurs when we encounter a statement that contains ideas or thoughts that are conflicting (in any case, this is a simplistic way of understanding paradoxes and we will not get into a deeper discussion here). The Barber's Paradox, of which there are many variations and which is also called a paradox of 'self-reference', perfectly illustrates this. I remember the loud arguments and counter arguments in class when this paradox, first proposed by the mathematician and philosopher Bertrand Russell, was discussed. This is how it goes.

Suppose there is a village, where all men are clean shaven, which has a barber who shaves only those who do not shave themselves, and no one else…the question is: who shaves him (the barber)? It looks simple at first sight but when you grapple with it, you get tied in knots. Now, if the barber shaves himself, he actually mustn't, since he does not shave those men who shave themselves. However, if he does not shave himself, then he must, since he shaves those who do not shave themselves! So, we encounter contradictions in both cases. In the class as the paradox kept getting discussed, I actually remember imagining an unshaven barber whose beard kept growing and growing infinitely

(actually, beards don't grow that way!). Anyway, we had fun with this paradox.

Channa then mentioned that this paradox actually exposed a contradiction at the heart of set theory. In simple terms, this would mean that there is a statement 'S' such that 'S' and its negation (not S) are both true. Such inconsistencies would make the foundations of mathematics very shaky, since we would then have no basis for trusting any mathematical proof (remember, we discussed the angles of a triangle theorem and its proof earlier, where we remembered Channa's insisting that proof must be solid and robust, no matter what kind of triangle one considered?). To illustrate paradoxes that are like the Barber's Paradox, reflect on what is famously known as the 'Liar Paradox' (which, I remember, we also discussed in Channa's class):

"All Cretans are liars."
(attributed to Epimenides the Cretan)

Like the Barber's paradox, the above statement results in contradictions. Think about it.

Again, when I look back, I wonder and marvel at the depth of CK's understanding of the subject, which he used so effortlessly to help us appreciate the pillars around which mathematical thought has been built over the millennia. I remember the fascination, and it still gives me goose bumps when I recall those few classes which enabled us a deeper glimpse of mathematical reality. It is only when one loves the subject and when one *cares enough* for the learner when teaching it, that will make you take the trouble to go the root of that discipline, and expose it to the learner. This can bring real joy. Joyful learning, unfortunately, is a much misused term in the lexicon of education – instead of connoting that joy can arise from struggle and insight as well, we are talking of making things easier for the child through fun and play. This trivializes the struggle and achievement that is part of the process of learning.

I'm not sure about the context in which the 'Four Colour Problem' (FCP) was presented and discussed by Channa. May be it had to do with

the Konigsberg problem, before we got on with matrices. Maybe CK did say that it informed the development of new areas in mathematics like Graph Theory, Topology etc. The FCP was, till the 90's a great unsolved problem of mathematics (originating in map making and cartography) which stumped the best brains. Finally, supercomputers had to be called in (for the first time, literally, to establish a major theorem) to process the huge amounts of data required to establish the proof way back in the 70's. Even then, there was debate within the mathematical community – would *this* constitute proof? Did this not sound like an experimental proof which the natural sciences use routinely? Remember, in mathematics we are all used to deductive proof, Euclidean style! Anyway, a typical statement of the FCP might look like this:

> "Given any separation of a plane into contiguous regions, producing a figure called a *map*, no more than four colours are required to colour the regions of the map so that no two adjacent regions have the same colour."

To put things simply, it is like saying that one does not need more than four colours to colour a map such that adjacent countries or regions do not have the same colour. While mathematicians were able to show/prove the case with five colours, the four colour problem stubbornly resisted a solution for well over a century. Interesting, isn't it? One can never be sure which area of human activity can actually spawn a new area of knowledge which people keep pursuing even hundreds of years later!

And finally, who can forget Fermat's last theorem? We were discussing the theorem of Pythagoras, that the square of the hypotenuse of a right angled triangle is equal to the sum of the squares of the other two sides: $a^2 + b^2 = c^2$, where 'a' and 'b' are the two sides of the right angled triangle and 'c' is the hypotenuse. Every high school kid knows this, but few teachers would take the discussions forward beyond stating the theorem and one of its proofs (I have heard that there are approx. 370 ways of proving the above result!). CK went on where most teachers

wouldn't tread, and we were treated to the then 348 year old Fermat's 'Last Theorem', which states that no three positive integers *a*, *b*, and *c* can satisfy the equation $a^n + b^n = c^n$ for any integer value of *n* greater than two. This, the French amateur mathematician Pierre de Fermat had asserted way back in 1637 in his famous notebook on the margins. As we can see above, the Pythagorean case is a special case of Fermat's Theorem. To quote some examples, $3^2 + 4^2 = 5^2$; $12^2 + 5^2 = 13^2$, and there are various ways in which we can keep generating these 'Pythagorean Triples'. Channa treated us to a history of this problem and said, rather sombrely, that the Fermat problem was one of the famous all time unresolved problems of mathematics. 'Maybe one of you will solve it one day!' he said, with a twinkle in his eye.

The mid 80's were exciting times for Fermat's Last Theorem (FLT). Countless mathematicians had by then grappled with it, and proofs had been presented for specific cases, and for 'n' running into several million. But there was no general proof. Little did we realize then (in 1985) that Andrew Wiles, the British mathematician was very close to deciding that he would spend the next seven or eight years in his attic in complete secrecy to crack the problem. Finally, in 1994, when the problem was declared as solved, I'm not sure if Channa was still teaching at Baldwin's to make this announcement to students of the 9th or 10th grades. Wiles' story is fascinating and if I talk about it here, we will move away from CK. There are popular books written on FLT which explain the story of the struggle behind its proof.

We were treated to these mathematical gems by CK for three years. We also discussed about the mathematics of the infinite, though I do not remember any specific instance that caught my attention. There was one argument about whether the number of sand particles on a beach was finite or infinite. It was also interesting to note that there were 'different orders of infinity'. These days, I have revived my interest in the mathematics of the infinite.

History of mathematics
That mathematics even had a history like this was beyond our imagination as students, used

as we were to rote learning methods by and large. Channa had in-depth understanding of this history. A topic which caught my attention in school was the discovery about Indian mathematicians. When we discussed Pythagoras's theorem and did quadratic equations in algebra, Channa posed questions that Indian mathematicians attempted more than a thousand years ago. I clearly remember Channa discussing the 12th century mathematician Bhaskaracharya II. In fact, he had picked up a problem from Bhaskara's *Lilavati*. This is Bhaskara's treatise on mathematics (written when he was in his thirties), and as the fascinating story goes, is dedicated to his daughter Lilavati. If I remember correctly, Channa picked up the following problem from *Lilavati:*

> "A bamboo 18 cubits high was broken by the wind. Its top touched the ground 6 cubits from the root. Tell the lengths of segments of the bamboo."

It takes the simple application of the Pythagorean Theorem to find out that the lengths of segments of the broken bamboo are 8 and 10 cubits respectively. While we all enjoyed doing this problem and the class was greatly enlivened as a result, the fascinating part for me was the travelling back in time that we did and the realization at the time that there were Indian mathematicians going back a thousand years and beyond who had worked on what we were learning in school. While we had only touched upon the 'great' discoveries of Indian scientists and mathematicians in the history class, Channa's treatment of the subject brought things alive, and history was no longer restricted to boring dates and events and the mugging up of occurrences of the past. He would have been a very good history teacher as well! Incidentally, the above problem also appears in the history of Chinese mathematics and is known as the *Kou Ku* theorem. It appears prominently in the 13th century text known as *Hsiang Chieh Chiu Chang Suan Fa Tsuan Lei.*

In 1993, when I took to teaching at the Valley School in Bangalore after I had had enough of

manufacturing tractors, I learnt something more about the history of mathematics and took off from where we had left with Channa. A senior colleague of mine, who was also interested in understanding how mathematics was produced across cultures, came to know that someone called George Gheverghese Joseph, a scholar from the Manchester University was in town. Joseph had researched extensively the 'Non-European Roots' of mathematics. We went to meet him and invite him to a lecture at the school. To our delight, he readily agreed. His lecture was gripping, and covered a vast canvas. He showed how 'Eurocentric' the entire enterprise of mathematics and science was – indeed, this is what we are taught in schools to this day – that Europe was the centre of global mathematical and scientific development since the days of antiquity. Such a blinkered view ignores the fact that other ancient cultures also did a lot of mathematics, often predating the discoveries of Europe by at least hundreds of years. A lot of this took place during Europe's great slumber, the Dark Ages. In this context and in particular, Joseph talked about his pet research project — the discovery of mathematics of the 'Kerala School' which flourished between the 14th and 16th centuries most notably through the work of mathematicians such as Madhava of Sangamagrama and Nilakantha of Tirur, in Kerala.

Research on this alternative history of mathematics has conclusively shown that the work of the Kerala School predates the discovery of that great mathematical tool, the Calculus, by at least two centuries! While Newton and Leibnitz, generally acknowledged as the founders of the Calculus must be given their due for combining a range of disparate ideas into a coherent discipline of the Calculus, the discoveries of the Indian, Chinese and Arab mathematicians cannot be disregarded. In fact, as Joseph pointed out, we cannot overlook the transmission of mathematical ideas from Egypt, Babylon, China and India through the Arab world to Europe. Research in this area has thrown up compelling evidence that this mathematical transmission, right from the days of Pythagoras of antiquity, had informed the development of European mathematics

(Pythagoras knew that the Egyptians knew his theorem, though he also knew they hadn't proved it).

I further explored the seeds of curiosity that Channa had sown in me in the mid-eighties as a teacher, thanks to that chance encounter with Joseph in the mid-nineties. I faithfully shared these exciting discoveries with the children I taught. I also ended up buying his book *Crest of the Peacock,* in which Joseph elaborates the theme of mathematics as it was done and discovered outside Europe, starting with the mathematics of the 'Ishango bone' (actually, a lunar calendar) from the mountains of Central Equatorial Africa 20000 years ago! It is a fascinating read and will certainly open your eyes. I'm sure Channa knew about the alternative perspective on global mathematical development, but we didn't discuss it in school.

The Valley School
I graduated from Baldwins in 1985 and became a reluctant engineer in 1991. After a two year boring stint in the industry in which I was a production engineer in a company that manufactured tractors, I decided to become a teacher. One reason surely was that I wanted to keep on learning, and I wanted to share the joy that comes with discovery and insight with children. Also, I was angry with our insipid educational system consisting mostly of de-motivated teachers most of whom were just doing their jobs. In that surge of idealism that I felt as a young man, I wanted to change the world by becoming a teacher.

I attribute my reasonable success as a Mathematics teacher to the fact that I learnt from what CK did with us in school. I made it a point, for instance, to discuss the history of mathematics in my classes. The Valley School library offered me good resources. I dabbled in 'Vedic mathematics' (VM), demonstrated some of its methods, got children excited and got involved in the debates around its veracity as a system of mathematical system. Joseph does talk about Vedic mathematics in his book but there are questions about whether Vedic mathematics

actually originated from the Vedas, or, as I said, if the system is robust enough to be called mathematics. I remember attending a workshop organized on VM by the local RSS Shakha in Chamarajapet in Bangalore. We were trying to solve cubic equations, and the 'magical shortcuts' of VM were on full view. But when we slightly changed the coefficients of 'x' in a cubic equation, the Vedic methods failed. Anyway, the children lapped up whatever I could teach.

Wherever possible, I took children on a historical trajectory. We solved ancient problems based on the Pythagorean Theorem, in Trigonometry, Analytical Geometry, Logarithms and we widely debated paradoxes in mathematics. I included many of these discussions in worksheets and even managed to give problems based on these discussions in the various test papers that I set. Further, most of what I did with the blackboard as a teaching aid was what I learnt from observing CK.

There were several 'Aha!' moments that the children and I experienced. I still remember how awestruck they all were (class IX students) when I showed them, through a small table I had prepared, how the idea of a logarithm actually works and simplifies the operations of multiplication and division, by converting them to the easier processes of addition and subtraction, respectively. Imagine, instead, if I had begun by saying: 'If $a^x = y$, then 'x' is called the logarithm of 'y' to base 'a'! This is why children run away from mathematics. Well, we talked about the historical context in which logarithms were invented, and then I told them the story of the Scotsman John Napier who is generally credited with the invention of the logarithm. It is interesting that Napier indulged in mathematics as a hobby.

As you can see, CK's legacy lived on in my life as a when I became a teacher. It still does, nearly three decades later. See, that's what a good math teacher can do to you!

My Math Teacher
I met Channa at his residence again in March 2000, just before my marriage. He was happy to see me and was curious to know what I was

doing. We discussed the strengths and ills of our education system and he listened quietly to the many things I shared about my work in education. He had retired from Baldwins by then, but went to school every day to drop his grandson to school. He couldn't make it to my marriage reception and I learnt later that he was not keeping well that day.

For me, Channa will always remain the model math teacher. I have not seen a better math teacher since. He perfectly straddled the discipline of mathematics and its teaching – he was its passionate and eternal student and at the same time he loved teaching the subject. It is widely recognized in educational theory that the teacher's knowledge consists of both subject matter knowledge and the knowledge of teaching (pedagogic content knowledge) among other aspects of knowledge that are needed to become a good teacher (if one views the teacher's problem as a knowledge problem, that is). In a class of nearly 50 students and in a school that was traditional at best, Channa struck a great balance. If I remember his teaching nearly thirty years later, it is because what he taught was internalized – forever! The teaching of procedures in mathematics (procedural knowledge) is a small part of mathematics education. It is the understanding of deeper conceptual underpinnings that is important. If one develops insights here, these insights are likely to stay throughout one's life. And Channa was constantly chipping away at the deeper and mysterious structures of the mathematical world, inviting us to explore and savour its beauty.

As I write this, I have taken easy recourse to the internet to check if what I remember from Channa's classes is correct. The World Wide Web is a place where everything we discussed in school with Channa is easily available, in print, in videos and in all sorts of forms. You can access all the fascinating stuff and it will keep you occupied for a lifetime. At the same time, the internet can dumb you down – it provides many things on a platter and you are tempted to copy paste from the myriad notes and articles and call them your own! No wonder then, that there is software developed to detect plagiarism. But in the eighties when CK taught us, the '*www*' was not even in our wildest fantasies of the future. He must have therefore read a lot, sitting in libraries and looking for his favorite books in bookshops. When some of us got a glimpse of his private library, we knew he was a serious reader of mathematics and science and literature in general. His study was filled with hundreds of books then — all arranged wherever space was available in haphazard but beautiful ways. Perhaps that's where I developed a penchant for setting up my own library.

Another meeting
Till I neared the completion of this article, it hadn't occurred to me that I could meet CK again. This suggestion (which looks rather obvious now) was made by a few friends who read and liked the story. 'You must go and meet him again, and find out more…' is what they seemed to say. But almost as soon as I started thinking about it, a sense of foreboding and anxiety seized me. Would CK be *around*? 1985 was 27 years ago. Some of our teachers had moved on. Even if CK had retired in the mid-nineties, I speculated, he would be in his late seventies now. But late seventies is not too late, right?

There was this opportunity in April 2012 when I was in Bangalore on a short break from work. Despite being swamped with household chores and demanding children, I finally managed to knock on the ground floor door of 'Vasudha', his house in South Bangalore. Long moments passed in trepidation before his wife opened the door and asked 'Yes?'

'Can I meet Mr.Channakeshava?'
'Yes. And you…?'
'I was his student in Baldwins in the eighties…'
I mentioned my name.

He was sitting on the floor in the living room, watching a game of cricket during the IPL season. Phew!! What a relief it was to see him in flesh and blood again! He must have been surprised to see me. But Channa, I remembered, was not very expressive (except, perhaps, when he was teaching math!). I was invited into the living room and we started talking. He looked a lot older, had lost some weight but his gait was straight and there was that gleam in his eyes as our

conversation slowly turned to mathematics. He asked me what I was doing. I shared my life's trajectory with him but quickly got to the point. I said I was interested as an educator to understand his trajectory as a teacher. 'Your story may have many clues that may enable us to make better teachers…' I trailed off.

'I had this urge to write about you', I said, continuing as a matter of fact. 'And as I started writing, I realized that I actually wanted to meet you again.' I didn't mention the anxiety that had seized me as a result. 'That's how I'm here, to find out more.' He just smiled, as was his wont. I also told him that there are very few stories about teachers that we can use to understand that complex thing called teaching.

I told him I would come back the next day with the article for him to read. 'Would you have the time for a few questions?' I asked. 'Of course, do come…!' So I went back with the article the next day, and he took about half an hour to read it. His daughter and wife kept talking about him as I waited for him to finish reading. And then, he looked up and said 'Shoot! Ask me…' That is how I learnt more…

'You can't teach a subject without motivating the child to learn it…' he began. 'And anything that arouses the curiosity to learn is fine. Arouse curiosity, that's it! The rest will follow.' How true, if I look at my own case! 'Further', he went on, 'The key question is how does one 'come down' to the child's level? This can take years for the teacher to discover, and there are no hard and fast rules here. Each teacher has to figure it out on his or her own, and this cannot be force fed.'

I asked him to tell me about his formative years, about people who influenced him, and how he got to do what he did as a teacher. I learnt that he had wanted to become a teacher at a very young age. The thought had occurred to him, and nobody seemed to have put that in his mind. During his Bachelor of Science days in Mysore in the late fifties, he had encountered a Physics Professor from Indian Institute of Science called Subbaraya who taught them spectroscopy. 'He was an early inspiration for me. What I liked about him was his humility. At the same time the

man had guts and loads of conviction about his own understanding of the subject. His arguments and debates with the Nobel Laureate C.V Raman are the stuff of folklore.' The Physics Professor seems to have strengthened his resolve to become a teacher. The urge to find out, teach and share deepened further.

Channa also recalled how another teacher, Venkatasetty, had introduced him to George Gamow's famous book '*1, 2, 3…Infinity*' which set him out on a trajectory of discovery and learning. Following his B.Sc., he taught for four years in a school in Sagar near Shimoga. In 1962, he joined the RV Boys High School in Bangalore. A Bachelor's Degree in Education (B. Ed) followed, and he set foot in Baldwins in 1964. There are some defining experiences of his life that go back farther in time. Channakeshava, I discovered, came from the village Mattur in Shimoga district. He became proficient at a young age in Sanskrit – he could read, write and speak in Sanskrit effortlessly. I found this interesting. 'There was this chap called Venkatram in our village and he was an avid math student. He had a copy of Bhaskaracharya's *Lilavati* in Sanskrit, which I started reading even before going to college.' Mattur, I later discovered when it occurred to me that I should find out a little more, happens to be one of the two or three villages in Karnataka where everyone speaks Sanskrit!

The early experiences were definitive as I could make out. The early exposure to Bhaskara's treatise *Lilavati* stayed with him and we were treated to problems in algebra and trigonometry year after year from *Lilavati.* For Channa reading as a hobby had developed in school and stayed thereafter. 'The teacher should essentially be a student. Reading helps him to be a student.'

'How was it in Baldwin's given that it is a traditional school? I sometimes wonder what you may have achieved had you taught in a more liberal school…' I ventured to ask him. 'Baldwins was frustrating sometimes. Every institution has its politics, and there were colleagues who viewed what I tried to do as a teacher with suspicion. They may have said many things behind my back. But I carried on. When your goal

is to make teaching interesting, what can stop you…?'

As we continued, Channa pointed out something insightful. According to him, mathematical concepts are all interlinked. To teach a concept, underlying concepts must also be illustrated to the student whatever the grade may be. Further, each concept has an interesting history of human intellectual struggle and its accompanying politics. When this story is told, children get naturally curious and want to find out more. 'For instance, the Konigsberg problem led to topology and network theory, and the idea of arrays and combinations. So when we took up the topic of matrices, I made it a point to tell this story.' That's exactly what I did too, to great effect, when I taught nearly a decade later! Of course, it takes quite a lot to develop skills of communication that will enable the teacher to make complex topics edible to school going children. But as the saying goes, the most complex ideas in mathematics are simple in their essence. It is the task of the teacher to grasp this essence.

I realized that I was beginning to take much of his time and hesitated carrying on. So I told him that I would keep in touch and that my journey of discovering him as a teacher had only begun. He seemed enthusiastic about meeting again. His daughter Ranjini, who was part of this conversation, mentioned that her daughter was a great fan of his and she would have much more to add about him. It then struck me that I could reconstruct his story by talking to his family members. But that had to wait for another day.

'Over the years I have received many letters from students.' He said. My antennae stood up immediately as I heard this statement. Here was a great archive which if plumbed would yield many a secret! I realized that I needed to reach out to as many students as possible, working in different corners of the world, to tell me their stories of Channa. I saw a book on Channa slowly emerge as a story of inspiration for countless other teachers. The next time I'm in Bangalore, I'll go to Vasudha again and ask him to provide access to those hundreds of letters!

I cannot help but reflect upon the status of the teacher now and wonder what it would mean to take a leaf or two from CK's book. Can training make great teachers? Or, are teachers made even before that? I would tend to believe that one should love teaching and I'm not sure if this can alone come from teacher preparation. At the same time, I'm not discounting this preparation, both before and after, one becomes a teacher. This learning is an eternal journey. But it saddens me to see how teachers are treated within the educational system. We have created a system where we see the teacher as a contract worker who is often paid a pittance, who is made to do all kinds of things other than teaching and whose support systems are non-existent. Yet, we expect a lot from the teacher and somehow expect the teacher to be 'different' from the rest of the human species. How then can we expect children to glimpse that wonderful world that CK showed us, that I continue to see and marvel to this day?

Gurjeet Kaur

Textbook representations as reinforcers of (mis) understandings : The case of ray diagrams in Optics

Abstract

Images are representations aimed at conveying shared understandings about the world and like all representations they need to be appropriately interpreted. Ray diagrams are representations that students are introduced to at the secondary level and are thereafter used as a primary means to understand and predict the behaviour of light as it passes through a mirror or a lens. This paper examines the adequacy of ray diagrams as pedagogic tools, as they figure in the class X textbook of science.

Introduction

Textbooks continue to be the chief propellant that guides the transaction of curriculum in Indian schools. The representation of knowledge in texts is a crucial factor in shaping students' conceptual understanding. Images such as diagrams, sketches and other forms of visual representations are important means of communication in physics. This is specially the case in optics in which pictures, diagrams and symbolic representations are introduced quite early in the study of the topic. These images act as a crucial link between reality and our conception of it. Yet, one must be alive to the nuanced linkage between these representations and the abstraction of knowledge from it. Images are after all symbols and it is important that these symbols are presented in such a way that they depict concepts in the intended sense.

Status of ray diagrams in optics

Mirrors and lenses are fascinating playthings that a child encounters in her everyday life and provide early investigative opportunity for studying the behaviour of light. Ray diagrams are among the first graphic tools that a student is introduced to for analyzing and predicting the behaviour of light when it falls on a mirror or passes through a lens. However, the texts provide little help to the learner to interpret these diagrams. Ray diagrams are presented in the book like any other visuals, such as an illustration or photograph. The child is expected to make sense of these diagrams on her own and then negotiate the linkage between real world and symbolic representations. What needs to be appreciated is that even the relatively straightforward visuals such as photographs are not a vehicle for conveying actual knowledge as they are only depictive of reality.

Ray diagrams in class X Science textbook

Grades IX and X are a special juncture in the school life of an Indian child since these are the mediating grades between upper primary and higher secondary stage. It is during these two years that the students will decide the subject areas that they wish to study and pursue later in life. The textual treatment of subject matter during these years is therefore an important factor in shaping the conceptual landscape of learners as they stand at the threshold of higher studies. While the NCERT textbook for class IX has no chapter on light, class X textbook has two chapters devoted to the topic namely: i) Light-Reflection and Refraction and ii) Human Eye and Colourful World. Ray diagrams figure as prominent pedagogic graphics in the chapter on reflection and refraction to understand the image formation in mirrors and lenses.

The following ray diagrams that show the image formation in concave mirror and convex and concave lens have been taken from the chapter 'Light-Reflection and Refraction' :
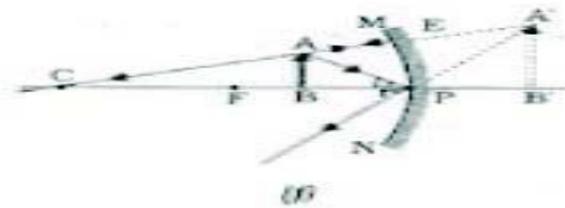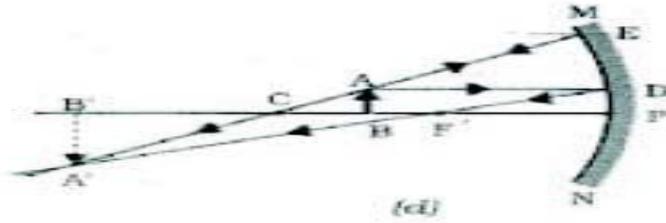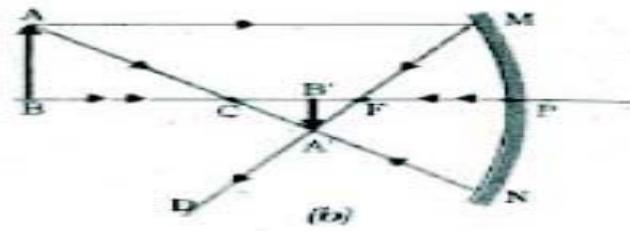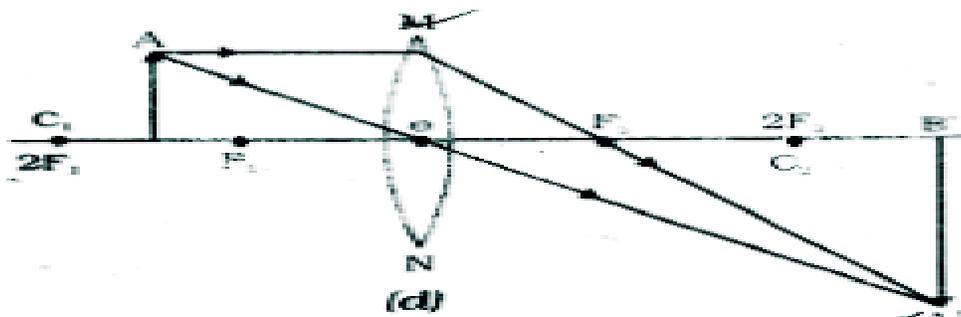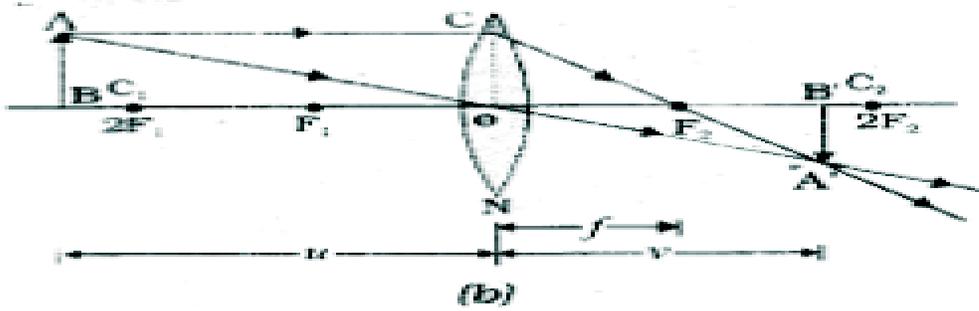
(b)

(d)

(f)

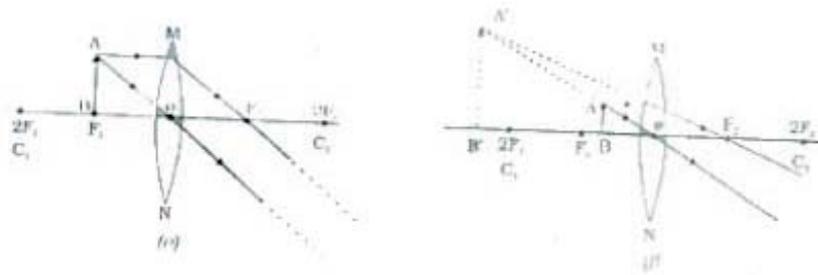Image formation by a concave mirror

(b)

(d)

Figure 10.16 The position, size and the nature of the image formed by a convex lens for various positions of the object
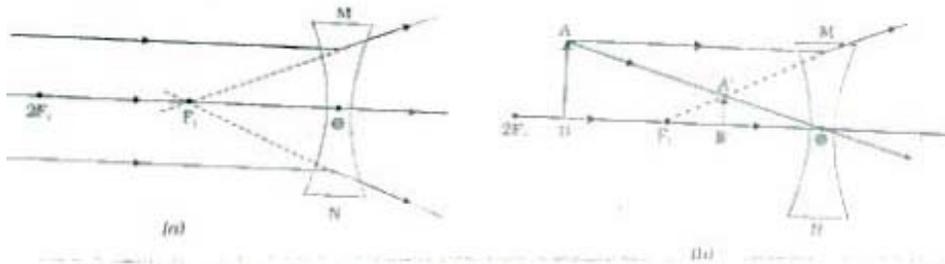

Figure 10.17 Nature, position and relative size of the image formed by a concave lens

None of the diagrams indicate the position of the observer. In fact, the image would be observable only from certain locations. Only two rays emanating from the tip of the extended object are shown contributing to the image formation. Actually many rays emanate from each point on the object. Not all of them pass through the lens but the ones that do contribute to image formation. The screen is not shown in any of the diagrams giving the impression that the image (without the screen) would be observable from anywhere. Only two diagrams show a slight extension of the rays beyond the point of image formation but the significance of this extension is not brought out

The interpretation of ray diagrams has figured as a prominent subject in the literature related to the pedagogical considerations of optics. Based on the provisional grid of features that might raise difficulties in reading images and graphical representations of STTIS group, Colin, Chauvet & Viennot (2000) put forward these reading difficulties: *Real world vs. schematic or symbolic entities* i.e. a student may misinterpret what is 'symbolic' with what is 'real' and *selection and salience* i.e. the authors may think it unnecessary to represent certain aspects of an image but students may feel that necessity. Galili and Hazen (2000) also point out that one peculiarity of optical instruction is that it is based heavily on graphical symbolism which is subject to interpretation. Arons (1997, p.257) laments that in regular textbooks the assigned problems in optics only focus on numerical or geometrical determination of image positions with mirrors and lenses and students do not get a holistic picture. Students are also not encouraged to visualize the overall array of physical phenomena especially those related to light radiated or reflected from the object. Kumar (1999) also links many of the intuitive notions in physics to image interpretations. He lists certain important aspects that must be stressed by teachers while teaching optics. These are: a) From every point on object emanate not one but a bundle of rays; b) For vision, an object need not necessarily be a 'material object' but could be any region in space from which rays are emanating; c) When a screen is placed at the position of the real image it acts as

a diffuse reflector and we see the image just as we see any other spot on the screen; d) The bundle of rays arriving from an object P to its image P' do not end there but continue past it.

Taking the graphic-reality dichotomy as the referral framework, the ray diagrams appearing in the class X textbook of science can be critiqued on the following counts:

Overselectivity and Salience: While the text clarifies that though many rays emerge from a given point on an object, only two are being shown for convenience; this implicit message does not get translated to the accompanying visuals. Not only are *only* two rays shown but it is the *same* two rays giving the impression that these two rays are the only two rays emanating from the illuminated object and the only ones contributing to image formation. Vienot (2006) pointedly highlights the inadequacy of such depictions. She conducted a study with two groups, one consisting of degree students and the other of trainee physics teachers. She shows that how by making no other change in the instructional input for image formation in lenses except adding two 'critical details' to the diagram, she was able to bring about a significant improvement in the conceptual understanding of the experimental group. The two additional features were: Showing many rays and beams except for the usual two and also showing some rays that do not impinge on the lens. This is a powerful illustration of the influence of appropriate graphics in enhancing conceptual understanding.

Incompleteness: Some diagrams are incomplete in the sense that the rays are not extended beyond the point of image formation. Goldberg and McDermott (1987) point out that while it is important to show the extension of rays beyond the point of image formation it is equally important that the students appreciate the significance of this extension. The rays after meeting at the point of real image formation tend to diverge. If there could be some means to converge these rays, the image would again be formed. The eye with its convex lens provides this mechanism by converging the rays onto the retina.

Ignoring the position of the observer: We find that all the diagrams are indifferent to the position of the observer thus reinforcing the well documented (mis)conception that image is an independent entity observable from anywhere just as any other object. Ronen and Eylon (1993) make an interesting point when they say that the terminology 'field of view' may itself be confusing because in everyday life we tend to think of it as the expanse that is visible to the eye. However, in geometrical optics it is the image that is observable from certain positions and so we need to talk in terms of 'field of view of image'. There should thus be a constant effort to link the image to the observer.

Ignoring the role of eye: Just as the position of the observer is ignored, the role of eye also gets overlooked. The eye may then be understood as a passive instrument of image observation while its participation in the process of image formation may not be attended to. The eye does not act as a passive screen that receives the rays and forms the image.

Rather the convex eye lens is an active participator in the process of image formation itself as it converges the rays diverging from the image location on to the retina and so the image may be seen in the air if the eye is appropriately placed.

As an initiation exercise for a wider study on future teachers' ideas in optics, the following diagram was shown to 13 students enrolled in a one year teacher preparation programme offered to graduate/post graduate students. All these students had opted for physics as one of their teaching subjects.

These students were asked: In the situation shown in the given diagram, would the image be seen if the eye is positioned at the screen position? The query was based on the reasoning difficulty highlighted by Goldberg and McDermott (1987).

10 out of the 13 future teachers answered in the affirmative. The example though not generalisable, nevertheless indicates that the role of the converging lens in the eye remains unclear or is not appropriately attended to even among

students who have studied up to graduate level in physics.

Ignoring the role of screen: The role of the screen is neither acknowledged in visuals nor comes up as a subject of discussion. In fact, understanding the role of screen is crucial to understanding the process of image formation as the screen makes the image an independent entity that is observable from anywhere. Students often do not analyse the process of image formation in terms of the convergence of light. The presence of a screen is thought of as a necessary condition for image formation or image observation since screen is thought of as a device that 'captures' the image and consequently the students may find it problematic to explain 'aerial images' (Goldberg and McDermott, 1987).

Discussion
The school curriculum is tiered into different stages namely primary (grades I to V), upper primary (grades VI-VII), secondary (grades IX, X) and higher secondary (grades XI, XII). An examination of the text books of the upper primary and the secondary stage informs us that there is a sudden transition from a real world rooted exploration at upper primary stage to a more formalistic approach at the secondary stage. While at upper primary stage the world is explored and investigated through two characters – children called *Paheli* and *Boojho*; at the secondary stage the tone becomes explanatory and didactic. While at upper primary stage daily life observations are taken as the starting points for the study of optical phenomena, the subject becomes symbolic and graphic driven at the secondary level. Despite this visible change in approach there is little help offered by the textbook in helping the learners negotiate this transition. The idea of 'rays' as mere theoretical constructs needs to be clearly communicated and the idea of 'light beam' needs

to be frequently invoked. Ray diagrams need to show many rays emanating from different parts of an illuminated object. The fact needs to be stated that the object is illuminated by a light source present elsewhere but not shown here. There should be some rays that do not pass through the lens. The eye needs to be assigned a more active role and students must be led to appreciate that what would be seen or not seen by an eye in a given situation should always be analysed in terms of the path taken by light from the source on to the object and then following it up from the object (or a portion of it) to the eye. The role of the eye lens in formation of the image on the retina has to be highlighted. The symbolism of ray diagrams thus needs to be dealt with explicitly and consistently reinforced.

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J. Inbaraj

Reading Recovery Intervention of SCERT, Tamil Nadu

Abstract

The Tamil Nadu Activity Based Learning Programme (ABL) has been widely acclaimed as a path breaking collaborative, materials based, self-directed pedagogy for elementary education. This article traces the ABL process and highlights stakeholder expectations, the centrality of holistic language learning, and offers alternatives to enhance reading and writing abilities in children which is the core basis on which effectiveness of ABL rests.

Introduction

The Tamil Nadu Government launched the Activity Based Learning Programme (ABL) an innovative, interesting and collaborative class room process for standards I to IV, in 37,000 government schools. The innovation was piloted in 260 schools of the Corporation of Chennai from 2003 to 2006. It was up scaled to 10 schools per district and then implemented in all the government and aided primary schools of the State from June 2007.

The ABL story is a tale of multiple inspirations coming together. The vision of education and pedagogy are drawn from David Horsburgh's work at Neelbagh and subsequent work at Rishi Valley. David Horsburgh came to India towards the end of the Second World War, as part of the Royal Air Force. He started Neelbagh, a school in Kolar District. Upscaling the work of innovative schools to become a state-wide programme involving tens of thousands of schools was the result of political will and

Neel Bagh constituted the nucleus for a host of creative methods in teaching and a vast quantum of well-planned learning materials. David developed a diverse curriculum, which included music, carpentry, sewing, masonry, gardening, as well as the usual school subjects, English, mathematics, Sanskrit, and Telugu. .....

He had vertical grouping in the classroom and the children worked on the material on cards, at their specific level. These pedagogic materials were systematically planned, with sketches and drawings and an occasional touch of humour. Fresh materials on cards would be added frequently, to emphasize that the sources for lessons were not finite. David Horsburgh also planned and managed a rigorous and unique course for teachers. A great deal of theoretical material was part of the reading for the trainees, while the school provided the setting for teaching practice. When David Horsburgh passed away in 1984, the soul force of Neel Bagh declined and the family found it difficult to maintain the school. Rishi Valley School acquired Neel Bagh, and got some support from the HRD ministry at Delhi. Anil Bordia, Secretary in the Ministry of Human Resource Development, sanctioned a project linking Neel Bagh, Sumavanam (a school run by Usha and Narasimhan) and Rishi Valley.

Radhika Herzberger, Director of the Rishi Valley had the dream of offering relevant education to children in villages adjoining Rishi Valley, while also preserving the strengths of their specific culture and conserving the natural environment. She set up the Rural Education centre, consulting Rajeev Sethi about sustaining folk culture. The teachers and students of Rishi Valley helped to create materials, Alok Mathur and Padmapriya Shirali, teachers of Rishi Valley contributed significantly. But the early initiatives were fragmentary. At this time, Padmanabha Rao and his wife Rama Rao came to Rishi Valley. They had strong roots in folk theatre and poetry in Telugu. With their talent and enthusiasm, they were able to propel the movement. They consulted widely and learnt from a variety of persons: artist, writers, teachers and theatre people. Arvind Gupta (renowned designer of toys), P.K. Srinivasan (a committed and gifted spokesman for Mathematics) and mime and puppetry experts from Andhra, Karnataka and West Bengal were among the resource persons. Ganguli's programme called "Theatre of the Oppressed" offered ways to win the confidence of the local people. The Raos worked out the concept of the learning ladder. The Learning Ladder and its organization of the learning process into small steps has become an enabling tool for barefoot teachers. Its rule-governed flexibility makes for confident and involved teachers. At the same time, it makes the students less teacher-dependent. The ladder also serves as a monitoring tool for school administrators.

Source: Anandalakshmy
http://www.ssa.tn.nic.in/Docu/ABL-Report-by-Dr.Anandhalakshmi.pdf

visionary administrators. The work could visit was introduced to Tamil Nadu teachers through visits to Rishi Valley, dialogue with teacher associations, eliciting voluntary support of teachers who were interested in effecting change, preparing teaching learning materials, setting up ABL in select schools where teachers were interested, after careful teacher preparation where other teachers could visit to see for themselves, use of the state small scale sector for producing materials on large scale and phased roll out each time preceded by preparation and orientation.

ABL Tamil Nadu, evolved, drawing on these practices. Through ABL, learning materials could be provided for several children to be working on in a self-directed manner.

Popularity of ABL

The founder father of ABL, Tamilnadu, Shri M.P. Vijayakumar, IAS, the then State Project Director, used a participatory training mode, went down to cluster level trainings and interacted with teachers and teacher association members. This resulted in the teaching community implicitly accepting ABL. ABL became a buzz word among innovation seeking states and those states faced with multi grade education. Fourteen States have so far replicated this model. ABL expert teams from Tamil Nadu, visit the states and facilitate the development of cards conforming to their state–specific requirements.

Several international researchers also studied ABL. Teams from countries like China, visited the ABL program to assess its applicability in rural remote areas. They appreciated Tamil Nadu's child-centric pedagogy.

The first questions

However, in 2007 itself, some DIET faculty members raised questions about the efficacy of the process and wanted to do action research to see if the learning, as claimed by the developers, did happen. They questioned the excessive use of cards, the copious logos and the possibility of a child staying stuck in a particular ladder for longer spells of time. These questions and request by DIETs to undertake action research were discouraged.

ASER 2010 gives a jolt

After three full years of the implementation of ABL, ASER 2010 report claimed that the reading skills of the students and basic skills in doing simple arithmetic calculation were poor among grade V children in Tamil Nadu. SSA engaged the services of NGOs, freelancers, University professors and independent researchers to study the levels of achievement. But, the reports submitted by these research scholars commended ABL's capacity in enhancing the learning outcomes of a vast majority of children.

Relook at ABL cards

Text books were rewritten for the common school Board. The cards were not revised. DIET faculty members pointed out the need to align the cards to the newly developed content. Mrs. Jeyashree Ragunad invited Faculty of DIETs, BRCs and schools to consider revising the large number of cards with the support of Mrs. D. Sabitha, the Principal Secretary, School Education. The revised cards were quite relevant to the newly developed content and they helped children to relate their card learning to text learning at home too. The revised logos were simple and easy for children to track their own progress.

Real Concern

Mrs.D.Sabitha, IAS, Principal Secretary, School Education wanted to get the real picture from the grass root level. The Director of DTERT then (now SCERT) offered to involve DIET faculty members in a large scale reading survey in primary schools and give an interim report to the State Government and to suggest remedial measures.

Rationale for the Reading Survey - The Primacy of Reading Skill

Tamil Nadu has pioneered many educational initiatives such as Joyful learning , ABL and ALM

which have attracted fair amount of appreciation in the media, in other States and some countries. Yet, there exists a subtle but openly unexpressed grumble among the stakeholders of elementary education that more than 35% students are unable to read Tamil lessons fluently. If a reading test is given in Tamil to 10 students of Class V about four struggle to read. This situation prevails even in middle schools in Classes VI, VII and VIII. This situation, if not remedied, might increase the dropouts at the end of Class IX and the drop outs can only enter unskilled labour force perpetuating the vicious cycle of poverty which education promises to break. Teachers can ensure mastery of holistic language acquisition only when children acquire all the four skills viz listening, speaking, reading and writing. Tamil has the advantage of being the mother tongue of most students. The students do have adequate exposure to the spoken language. But the available repository of language is not used as a foundation to build on. Freedom to speak on favourite subjects can create excellent opportunities for language development, but teachers focus more on copy writing and listening, though ABL did attempt to break this to some extent. As a result, young children's innate capacity to produce language lies dormant. They grow up without the ability to think and express their ideas clearly. This inability to express oneself affects one's career opportunities and growth in diverse ways. There is a dire need to create supportive environment to allow the voices of children to be heard. ABL and ALM, the popular self-learning strategies, can produce spectacular results *only* if the students can read and succeed in making meaning. A large scale survey of reading was therefore absolutely essential.

More than 45,000 Government Schools are offering elementary education in Tamil Nadu. To ensure quality outcomes, it is mandatory to monitor and review the impact of class room processes in improving the skills of students in reading and writing. Reading is the most important requirement for ensuring academic achievement. As large number of schools are less frequently monitored due to limited number of monitoring officers, the real status of students could be noticed only when a report by Pratham (ASER) is flashed in the media.

The Reading Survey

A large-scale survey of reading skills was conducted in December 2011 in 2229 primary schools and assessed 40,188 students. 412 DIET Faculty were involved in the survey. A simple format for recording the reading skills of students was evolved for students of Classes V and VIII. The text books of the previous class were used for the purpose of the survey. They were assessed both in English and Tamil reading.

Table-1: Student Reading Skill in Tamil

Sl. No.	Std	Total No. of Schools	No. of Lecturers visited the Schools	Student's		Reading Skill in Tamil (%)		
				Enrolment	Present	Good	Average	Poor
1.	V	2229	412	50171	40188	53.3	34.98	11.72
2.	VIII	616	321	17235	13515	60.57	30.41	9.02

Only 53.3% students in Class V and 60.57% students in Class VIII could read Tamil fluently and this leaves much to be desired.

Table-2 : Student Reading Skill in English

Sl. No.	Std	Total No. of Schools	No. of Lecturers visited the Schools	Student's		Reading Skill in Tamil (%)		
				Enrolment	Present	Good	Average	Poor
1.	V	2229	412	50171	40188	26.85	40.99	32.16
2.	VIII	616	321	17235	13515	32.58	41.18	26.24

The reading skills in English are very low, yet children at the elementary level need to develop their reading skills in English more in order to move on to higher education and acquire greater self-confidence in their abilities to succeed in school and to meet the career related challenges after school

Table-3: Class V students' Reading Skill in Elementary Schools in Tamil :

Districts with highest percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	The Nilgiris	Kothagiri	Kothagiri	66.12
2.	Sivakangai	Kalayarkoil	Kalayarkoil	66
3.	Dindukkal	Oddanchatram	Oddanchatram	64

Table-4: Class V students' Reading Skill in Elementary Schools in Tamil:

Districts with lowest percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	Pudukkottai	Pudukkottai	Pudukkottai	29
2.	Villupuram	G.Ariyur	Thirukovilur	38.18
3.	Chennai	Chennai	Triplicane	38.27

Table-5: Class V students' Reading Skill in Elementary Schools in English:

Districts with highest percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	Madurai	T. Kallupatti	Madurai West	42
2.	Dindukkal	Oddanchatram	Oddanchatram	40
3.	Tirunelveli	Munanjipatti	Pappakudi	39

Table-6: Class V students' Reading Skill in Elementary Schools in English:
Districts with lowest percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	Pudukkottai	Pudukottai	Pudukottai	13
2.	Villupuram	G.Ariyur	Thirukovilur	14.19
3.	Cuddalore	Vadalur	Bhuvanagiri	14.29

Table-7: Class VIII students' Reading Skill in Middle Schools in Tamil:
Districts with highest percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	Coimbatore	Thirumoorthynagar	Pollachi (South)	77
2.	Sivakangai	Kalayarkoil	Kalayarkoil	77
3.	Dindukkal	Oddanchatram	Oddanchatram	76
4.	Virudu Ngar	Palayampatti	Aruppukottai	75.50

Table-8: Class VIII students' Reading Skill in Middle Schools in Tamil:
Districts with lowest Percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	Vellour	Ranipet	Walajabad	33.93
2.	Tiruvannamalai	Kilpennathur	Kilpennathur	38.46
3.	Villupuram	G.Ariyur	Thirukovilur	46.25

Table-9: Class VIII students' Reading Skill in Middle Schools in English:
Districts with highest percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	Sivakangai	Kalayarkoil	Kalayarkoil	61
2.	The Nilgiris	Kothagiri	Kothagiri	58.50
3.	Coimbatour	Thirumoorthynagar	Pollachi (South)	56

Table-10: Class VIII students' Reading Skill in Middle Schools in English:
Districts with lowest percentage

Sl. No.	Name of the District	Name of the DIET	Name of the Union	%
1.	Sivakangai	Kalayarkoil	Kalayarkoil	61
2.	The Nilgiris	Kothagiri	Kothagiri	58.50
3.	Coimbatour	Thirumoorthynagar	Pollachi (South)	56

*Source: SCERT, Tamilnadu

Interventions

The findings of the survey was brought to the notice of the Director, SCERT with a proposal to initiate a reading recovery experiment all over Tamil Nadu. Being a quick decision maker, he organized a workshop for studying the model and perfecting it with a simple trainer manual. The recovery experiment was incubated in a few blocks by a faculty from DIET, Thirumurthy Nagar. The Director, SCERT also released funds from Centrally sponsored schemes for training 60 DIET faculty, two drawn from each DIET, and also initiated research on the impact of Reading Recovery intervention in all the thirty districts.

Methodology

a. Diagnostic cards

Initially eight A4 sheet cards were used. The chronological use of these cards by the teacher facilitated the diagnosis of the status or the reading level of the child. This first batch of cards would also take the child step by step into successful reading practice. Experiments have demonstrated that within three months students could read even Tamil newspapers fluently.

The second batch of cards were 6 A4 size sheet cards. These cards help students identify letters which cause pronunciation problems and they overcome the problem following the strategies recommended in a very short span of time. These 14 A4 size cards are a great resource support to teachers who wish to help children recover from reading problems on a fast track mode.

b. Steps involved in reading recovery

(i) Introducing letters/Reintroducing letters

Teacher requires enormous patience in writing the letters of the alphabet on the black board or note book. She needs to encourage children to overwrite on the outline of the letters of alphabet slowly. While writing each letter teachers must spell out the corresponding sound of the letter with accurate pronunciation and encourage the child to repeat the sound of the letter while writing it.

(ii) Identifying the learnt letters in the newspapers

The teacher has to increase the pace of introducing letters two or three per day depending on the grasping power of each student. After ensuring that the student has mastered a few letters, he/she must be encouraged to encircle the letters in a Tamil newspaper. The repeated identification of new letters learnt with appropriate pronunciation gradually encourages children to join letters and read headlines of the newspapers. Care must be taken to ensure that each line in the newspaper is searched with alertness to identify the letters learnt. When this is done in all sincerity the curiosity to know the other letters gets triggered and peer tutoring blossoms naturally. Incidentally the shapes of letters get imprinted in the impressionable minds gradually. The game of identifying the letters in the newspaper must be played every day for at least 15 minutes. It is advisable to have as many copies of a newspaper as possible (could be old copies as well copies from the school library or from the personal collection of the teacher).

(iii) Joining the learnt letters and reading

By combining the letters, mastered words could be coined and children can be encouraged to read them. The teacher can also encourage children to combine the letters they have learnt to coin their own words and share them with their friends and discuss their meanings. When ever they seek help, the teacher may provide it.

When children join the letters they have recently acquired and try to read, the shapes and sounds of letters get etched in the minds of young ones. When students attempt to read out the coined words, teacher shall not assist them because only in that momentary struggle for linking the letters with appropriate sound lies the opportunity to learn. Peers might help if required but teacher should not meddle with the freedom of the learner to make mistakes and learn in a constructive manner with the support of friends.

Tamil is a unique language in the sense it is highly phonetic. Each letter has its corresponding sound, unlike English. Joining two letters, if a child successfully produces the sound then reading will naturally happen. Meaning making is a spontaneous process as the child listens to Tamil around herself all the time.

(iv) Connecting letters with symbols and sounds

There are special symbols in Tamil which join letters to give different sounds. Children need to assimilate how each symbol, while joining letters, undergoes change in the sounds they make and they must be given repeated practice in this. After they learn to associate the symbols with their sounds, they must identify the symbols in the newspapers. Besides, children must practice writing new words, combining the symbols with letters and spell them out correctly. Such a steady practice will increase their confidence and make them great readers in a few months.

The way forward

The Director, SCERT wanted to involve 40,000 student - teachers from DIETs and TTIs to visit schools and address reading problem squarely. As he migrated, the project awaits a successor with a passion for reform. Till then, the seeds of reform will await the magical touch of another seasonal leader . The diagnostic cards developed through this process has been found effective in Australia and Sicily for their beginners of Tamil language and foreign learners of Tamil.

References

ASER 2010 Document.

http://www.ssa.tn.nic.in/Docu/ABL-Report-by-Dr.Anandhalakshmi.pdf

Tamil Reading recovery cards can be downloaded from the link http://www.thamizham.net .

Reading Survey Reports (December 2011) from 30 Districts of Tamil Nadu

M. Sudhish

Documentation of the best practices adopted by SCERT and DIETs in Chhattisgarh

Abstract

The quest for innovations in the public sector has been on-going for quite some time, and with the need for the world to achieve the commitments made by its leaders in the Millennium Declaration, the 2005 World Summit and other global and regional conferences, it has attained a level of urgency. The global consensus on the urgency of reinventing 'government' is also manifested in research efforts that are focused on improvement of performance and governance in public administration institutions. It is the need of the day for innovators to come together and share their information and knowledge about their initiatives to minimize wastage of resources and time in reinventing the wheel. This paper is a modest attempt to document some of the successful processes of institutional transformation and renewal, experienced at the State Council of Educational Rerearch and Training(SCERT), Chhattisgarh.

SCERT Chhattisgarh was established after the creation of the state. Starting from scratch, the SCERT has grown tremendously and many old and big Indian states are learning from its functioning, innovations and governance today. There is much to learn about how the potential of an SCERT can be harnessed with proper vision and team work. This paper will explore how SCERT, Chhattisgarh evolved and the work done by it along with the DIETs in the state and is written with a purpose of dissemination to people working with public institutions in education as well as school leaders who want to be "change-agents".

Initial conditions

SCERT Chhattisgarh was formed in the year 2001. Five senior faculty members from two teacher education colleges were deputed to work in SCERT. However, no experienced staff from SCERT, Madhya Pradesh (of which Chhattisgarh had once been a part) was deputed. The functioning culture necessitated all action at the behest of directions from top. The office was established in a DIET campus in four rooms with old furniture received from Madhya Pradesh. State level institutions need to be role models for the grassroot organizations. This is not possible when waiting for orders from the top which can cause lack of motivation and lethargy among the staff. The processes of the SCERT gained momentum only in 2005 when it organized a conference to discuss the future education system of Chhattisgarh, the role and responsibilities of different institutions and the way forward. A large number of individuals and organizations participated in the conference.

Developing a 'new' SCERT

Developing Reading Habits. As a result of the discussions, the SCERT introduced a culture of reading books. Every month one title was chosen and discussed by the faculty members. The purpose was not just to develop a reading habit among the members but also their ability to understand, analyze, appreciate different kind of texts and to increase their knowledge base about various kinds of books available. The same culture was later introduced in all DIETs and a monthly discussions on particular books was initiated. The habit was also developed among the DIET students. Every school was supported to start their own library. Books were procured and teachers were trained to use school libraries. Regular state level reading day celebrations were organized. On this occasion, every village was encouraged to spend the whole day reading books. Chhattisgarh received the Limca Book of world records for arranging the maximum number of readers reading books state-wide on a particular day.

Core Groups and Open Discussions. SCERT has developed a culture of encouraging employees

to contribute their ideas for the betterment of school quality. The staff members are asked to assist in developing policies and programs and setting rules and procedures. Different cell in-charges are authorized to establish a committee or core group to build consensus. Once the issue is discussed in the core group, it goes for further action to the concerned authority. Based on the decision taken by core group, proposals may be turned down and also be improved and reshaped. The entire faculty of SCERT also meets regularly every week. During the meeting, each faculty presents his tasks of the week, future strategies along with the support required. Experiences of a meeting that the member may have attended or monitoring feedback of different programs is also a part of the meeting. Along with these issue related to education is also discussed. Same kind of process works at DIET level as well. Every month, one DIET is elected for organizing the state level monthly meetings of DIET Principals. During this meeting, apart from the review and presentations, the host DIET showcases its activities and arranges for visits to the model schools. This process has brought remarkable changes in DIETs and also helped to identify inspiring academic leaders working in different districts.

EduSat. EduSat Network was established in SCERT Chhattisgarh in year 2006-07. There was a gradual scaling up of the network coverage and presently the state has 128 SIT to cover different blocks. Education department makes regular use of this network for the capacity building of district and block officials and to have a direct contact and two way interactions with grassroots functionaries. During summer vacation, it is used to give special coaching to students appearing for various competitive exams. Experts are also invited at times to talk directly with children on identified issues. This network has helped to build the capacity of our teacher educators as well to make effective use of media as a distance education mode. State has also planned to use EduSat for monthly review meetings, receive feedback or interviews for research and regular training programs.

The SCERT's work

Textbook Development. The state initially was following the M.P. curriculum and syllabus with slight modifications. However, they were clear that the context of new state was different and therefore the state would require to develop textbooks that were rooted in our concerns and context. The process of making changes in the existing textbooks (M.P. Board) made it clearer that a lot more work was required in the area of textbook and curriculum revision.
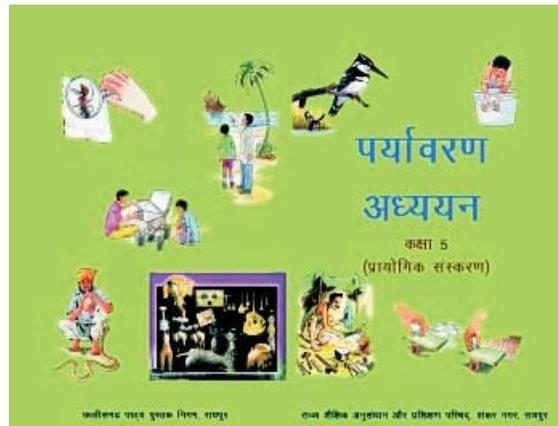
The process of revising textbook and curriculum of elementary level was initiated in year 2002. The task was huge and rigorous and was also seen as an opportunity to evolve a capable resource group that could gradually take up the responsibility to work for better quality education in the state in near future.

 It required not only vision and proper planning, but also novel ideas, expertise from various subject areas and a committed team. This demanded involvement of other agencies. A resource team with the support of ICICI centre for Elementary Education was formulated and Eklavya, Bhopal, Vidya Bhawan, Udaipur and Digantar, Jaipur were part of this resource team. People were identified from schools (Primary, Middle, Secondary, and Higher Secondary), colleges, DIETs and other NGOs. A workshop was organized with the purpose of developing a state resource group who can carry forward the work. The purpose was also to develop a shared understanding among the group about some basic issues such as: What is the purpose of

education; what do we mean by quality education, Nature of subjects, Knowing the learner, and the Learning processes etc. Discussion on: What is a curriculum and what is a syllabus and what are the criteria to decide a syllabus for various levels were also held.

Groups were made subject-wise and class-wise keeping in mind the interest and capability of the people. In the subsequent workshops people worked in these groups. The design of the workshop was such that people not only wrote the chapters but also read reference books, discussed the concepts among each other and tried out the content with children of that class. It was ensured that at the end of the day each group, in brief, shared what all they did during the day. For example issues raised, concepts discussed, difficulties etc were shared. Some of these issues were common for all, such as how to decide the content; which concepts and at which level and why; how many chapters; length of the textbooks, kind of illustrations etc. Some issues were subject specific - what do we understand by counting; fractions and variables; how these should be introduced etc.

Textbook thus developed were then pilot tested. Feedback from teachers as well as from children were taken and shared with experts and writing team and then incorporated in the textbooks.
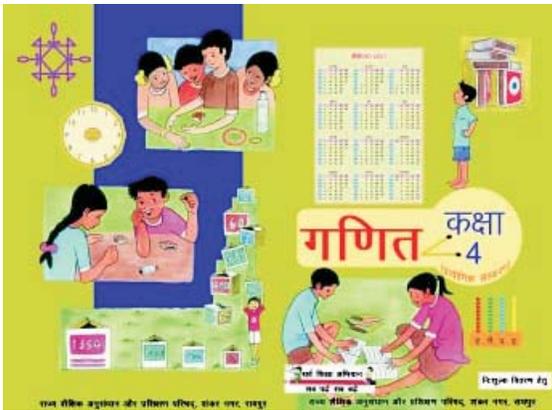
As mentioned above the textbook writing process was initiated with the support of ICICI Centre of Elementary Education(ICEE), UNICEF and institutions like Vidya Bhawan, Digantar and

Eklavya. To ensure continuity of support, the Chhattisgarh Education Resource Centre was also formed near the SCERT. This was a rigorous and continuous process and as per timelines, the textbook reform took place successfully in the state.

Improving Teachers' Training (in collaboration with the DIETs). Teacher training was also a new area for the state the DIETs followed whatever was instructed or guided from SCERT, Madhya Pradesh till then. The state needed to design its own training program. New elements such as identifying training needs, provision of help box inside the training hall to receive doubts, releasing TLM grants during teachers training through DIETs and developing teaching-learning material during the training program itself, Cafeteria approach of teachers training, cluster resource centres as subject-wise booster resource centres, using technology like EDUSAT and radio to train for Interactive Radio Instruction programs, dove-tailing with UNICEF and other support agencies to get best resources' or expertise cost from them and meeting the local expenses from state budget etc were introduced. In some cases, teachers were given the opportunity to have field experience to get proper training of that particular subject. DIETs were given various assignments from their Centrally Sponsored Funds to have a firsthand experience of the program or develop materials and try out with small groups before scaling it. DIETs were also given chance to organize state level workshops and seminars on different relevant issues. In order to fill the gap between Schools and DIETs we introduced, Jhatpat Surveys on different topics and Shodh Yatras in DIETs where regular students-teachers were initiated during vacation time so that students coming from different villages could go back and collect the required data from their schools during their two years training program. To monitor the block-wise progress of teachers training, teacher training tracking tool was developed.

D.Ed. New Syllabus. The need to change the age old content of pre-service training was realized while working on the new school curriculum and

textbooks and after their implementation in schools.
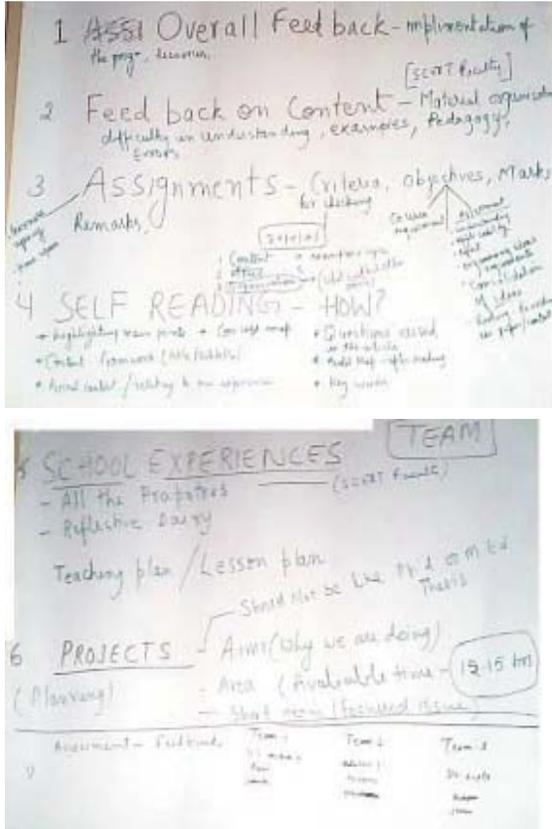
Teachers were required to have a certain kind of perspective, attitude, and ability to use new textbooks which the old curriculum was not offering. NCTE also developed new curriculum and states were expected to develop it curriculum in the light of NCTEF.

The process of revamping the whole D.Ed. curriculum was restarted in 2007-08 by SCERT with the support of some external organizations like Vidya Bhawan, Diganter, Eklavya, CERC and Azim Premji Foundation. A series of workshops were organized with DIET faculty, SCERT faculty, NOG members to discuss the curriculum, and also to select translate, edit and finalize the material for chosen subjects areas. Sufficient reading materials were developed and referred for the students and their ability to produce their own thoughts was emphasized, reducing the scope for cramming and reproducing without application.

Some specific changes made in the course include. Longer school experience program; content which push student-teachers to think, analyse and question; and makes them able to understand education in a wider perspective i.e. the philosophical, social, psychological foundations of education.

To introduce and share the perspective behind the course, orientation workshops for DIET faculty were also organized. A mechanism to get individual feedback of students and faculty were also developed. SCERT has also taken the charge of conducting exams for D.Ed. and implementing the new curriculum.. Now the state is planning to revise the curriculum of the B.Ed. course.

Systemic Reforms in the SCERT

Educator professionalism. SCERT has taken the lead in developing educator professionalism in teacher education. "Professionalism" is a form of liberty that is not simply conferred; it is earned. Accountability must be provided through rigorous training and careful selection, serious and sustained internships for beginners, meaningful evaluation, opportunities for professional learning, and ongoing review of practice.

Some of the systemic reforms initiated are:

1. Screening procedure for Resource Persons: In order to improve the quality of teachers training, the first and most important aspect is to have good and efficient Resource Persons. Generally Resource Persons are selected by the block level officials and there is no specific criterion. Block level officials have been forced to send those who are easily found to attend the training and workshops. This affects the quality of training and their impact in the classrooms. To overcome this situation, SCERT started a screening process for teachers' selection as Resource Persons. Teachers are now required to pass an exam to qualify to giving training programs and they are also given honorarium.

2. Testing of teachers: Whenever teachers are asked to attend the training, some of them boast "we have experience of many years of teaching and our students are now holding big posts hence we don't require any training". Experience counts but lack of readiness to learn new things and not seeing the causes of poor performance is a major problem of our education system. There is also a conflict between the old, senior teachers drawing handsome salary and the well qualified, newly recruited Shikshakarmis drawing minimum salary. The state decided to organize large scale testing of teachers to break up this mindset and identify the areas for teachers' training. There was a big protest against this initiative and in many areas teachers were not ready to appear in the test. But after talking with many organizations, teachers agreed to appear in such tests and results of these tests acted as eye-openers for them.

3. Online admissions: Earlier a lot of time was devoted in admission procedures. The whole staff was involved for more than one month to accomplish this task. SCERT developed the system of online admissions.

Fresh Thinking for Community Ownership
The role of the community in school management is increasingly being advocated. The state of Chhattisgarh witnessed a remarkable change in the area of community involvement and SCERT was a part of this process. One of its districts - Dhamtari -was a pro-active in this field. The idea of a four level community-involvement was introduced and gradually the journey from community participation to community ownership was initiated. The first step was taken in a small village Mainpur, situated on the border of Orissa. Parents here are daily wage earners. They played a very active role in making the school building attractive, constructing boundary walls, gardening as well producing vegetables for mid-day meal. They have also helped in purchasing computers for the school. A big library has also been developed with the help of the community.

Parents of another village Mahamalla in Rajpur cluster, Nagari block made bricks and constructed the boundary wall for the school. They introduced BALA concept in school and grew vegetables for the Mid-Day Meal. Parents in many of the villages have issued a card under the scheme "Ann Ghat Yojana" in which each house puts a handful of rice in a pot for school. Another scheme "Gyan Chakra Policy" motivates people to leave drugs, liquor, tobacco and invest the money thus saved for the improvement of school facilities.

In one of the schools of Pandripani village, the teacher is allowed to stay in school premises and the school starts early morning at six o'clock with yoga and sports. Parents also attend the yoga sessions and take charge of school in the absence of the teacher. In the evening, the teacher provides coaching classes for weaker children and support in home work. Mr. Narsingh Netam, a 55 year old person from Dongripara village has passed class 5 long back. The village donated computers for school and this old man learned computers from the school and now he teaches computers to children. He also types the question paper for all the cluster schools himself. More than 80000 parents supported schools in the district to undertake the students' assessment in a single day throughout the district, with transparency. Based on such experiences, state governments have introduced the concept of class-wise evaluation and quality improvement committees in all schools of the state and issued detailed guidelines to form such committees and provide orientation to the community.

Motivation matters
Director SCERT, gave utmost importance to the motivation of staff members and employees. He initiated the process of long-awaited large scale promotions. Maximum number of employees got the benefit of promotions. School set-up was approved and teachers' posts were tried to be filled as per new set up.

State Human Resource policy was developed and specific job charts for different posts were released. Performance-based appraisal policy was also introduced. SCERT also developed school education policy, policy on MLE, policy

to stop physical and mental harassment, ECCE policy etc.

Most of the DIETs lacked adequate staff. This affected the functioning of DIETs and they were not able to give expected outcomes. In order to bring expert staff from Elementary level, an exam was organized for those Shikshakarmis who were interested to work in DIET as deputation lecturers. After their internal exam and interview by the committee, they were given the post of Deputation lecturers in DIET. Presently more than 100 such teachers are working in different DIETs.

SCERT staff is regularly asked to write on different relevant issues. They are also supposed to develop different projects and write reports. Their reports were read carefully by the Director and comments were given for further improvements. On every good report, the faculty used to get comments as well as the sign "!!!" as a reward. Faculty used to get motivated whenever they used to get such remarks and this was one of the most discussed and shared issue among the faculty.

The faculty used to contact district officials for their work done and to know about the status of the work. They used to call from their mobiles and expenses were to be borne by the faculty itself. In order to have much closer contacts and provide more academic support to the districts and have more and more interactions, SCERT decided to provide them mobile connections and free call facility among the group in the system. This helped them to improve the coordination and timely information dissemination.

The faculty members were also provided training on the use of computers and after getting the training, they were provided latest laptops and other equipments to have a good workstation. SCERT also spent money to develop beautiful cabins for the staff. Centralized cooling system and clean drinking water facilities were arranged to have a good working environment.

One of the best parts of employee motivation is that the faculty is given full liberty to choose the work of their interest and expertise. They are allotted work as per their request and background.

All DIETs were able to send their faculty to different IIMs to study different issues of their concern. They came to know about the latest trends and cultures being followed by advanced institutes and were able to adopt some of them in their own DIETs.

Exposure visits are very important for learning new initiatives as well as employee motivation. SCERT provided them the opportunity to have exposure visits to some of the European countries and learn many new things. Officials learned how the school functions, school administration mechanism and various reforms being done in the field of education in other developed countries. Faculty members were so motivated through these visits that they started taking the initiative for having such exposures without Govt. support or funding. One of the faculty got the opportunity to visit United States and study educational system from Pre-primary to University level under IVLP program.

Conclusions and Implications

This paper has tried to document various successful initiatives undertaken by Chhattisgarh SCERT. In-depth analysis is not possible with limited resources, expertise and time. There is a need to identify the critical elements of reform. There is further requirement to focus the study on the vision guiding reforms; the leadership driving reforms; the knowledge and research/ inquiry foundation upon which the reforms are built; the opportunities for learning needed to sustain these reforms; the mechanics for communication used to coordinate them; the organizational arrangements designed to support them; and the strategies used to support them.

If we go through the strategies followed to implement the above programme, we find the following principles being followed to achieve time bound sure success:

1. Create a culture that works: The courageous leader takes ownership, working closely with the employees and plays a major role in

building a climate that can make the difference between winning and falling behind the curve.

2. Possess the courage of your convictions: courageous workers have a strategy and game plan in place of how to lead human resources, and the courage to "just do it".

3. Adapt to a changing environment: Some organizations are stuck in the past. This is the way it was done yesterday, and we'll continue to do it the same way. The best leaders accept two truisms. First, there is no such thing as staying in the same spot; you are either advancing or falling behind. And second, it's sheer lunacy to continue doing the same thing and expect different results.

4. Operate with minimal fears: Old-style workers were riddled with fears. Anxious about losing their job, uncertain about their roles in the organization, and often viewed as outsiders, they operated with a defensive posture. But the new leaders lead with a clear direction, set strategy, work with others, believe in their own skills and can face disagreement. Fear is not the motivating force, but doing what's best for the organization and creating strong strategy to deal with the change are.

5. Let the projects be the managers: A rigid hierarchy of authority makes employees less focused on the output and more focus on their next promotion. If all team members are committed to a goal, politics fall to the wayside and a focus on a successful projects drive the result. This encourages innovation, allowing more people to step up to the plate and great ideas to come from anywhere.

The good news is that as the SCERT, Chhattisgarh demostrated, the ability to innovate is a learnable skill which the educational administrators must learn. The process of inovations is never-ending and the work of SCERT & DIETs not yet over.

H.K. Dewan

Exploring alternatives in teacher education

Abstract

Over the few years, the need for teacher education courses that are more than face-to-face has been increasingly felt. The article examine the factors behind this new demand and suggests some alternatives and the enabling conditions needed to make them possible.

Introduction

The importance of teacher preparation and provision of opportunity for their continuous development has gained prominence in the last two decades. The emphasis on pre-service preparation of teachers has been further heightened by its inclusion in the RTE 2009, the time-bound nature of the recommendation has lent an urgency to the efforts. The act mandates, as part of the definition and essential requirements from a school, the presence of trained teachers (those who have undergone pre-service education). The act, apart from the criteria for teacher qualifications, also describes the way teachers are expected to work with children. *They are expected to encourage learning through activities, discovery and exploration in a child friendly and child-centred manner and make the child free of fear, trauma and anxiety and help the child to express views freely.* The courses and programs of teacher preparation and development have to keep these expectations in mind and gradually transform themselves to align with similar ideas in NCF 2005 and NCFTE 2009 and yet avoid the pitfall of being dogmatic about pursuing them to the letter. Both these advocate redefining of the curriculum and seek to establish teaching as a social practice that promotes local knowledge, active citizenship, diversity and inclusion. They emphasise the role of the learner in building her concepts and clarify the distinction between knowledge and information or between understanding and then finding one's own path versus knowing and following rules and/or methods taught.

The above - namely teachers' qualifications, their approach to teaching and their continued capacity building - have implications for many aspects of the education system and its relationship with the teacher as an individual as well as to the collective of teachers. Teachers often are reduced to implementing agencies for new incomplete and impractical ideas that are imposed albeit transiently before moving on to another idea through programs and projects. Their autonomy has steadily declined as has scope for initiative as they are forced to conform to centralized patterns of teaching and assessment. The content and pedagogy of teacher preparation programs needs to be overhauled. But more importantly than this also is the need for change in the way the system addresses their space for thought, respects and nurtures their capability and sense of purpose. It is also important for the system to take cognisance of the need for their motivation and challenges they face. These are aspects that are crucial to any improvement in schools and classrooms. Undermining their self-respect and their agency even by giving them well prepared recipes can not lead to interesting and meaningful engagement for students. While all these issues cannot be addressed in this article their importance cannot be over emphasized.

In the context of the window of time for pre-service preparation as mandated by the RTE 2009, it is crucial to remember that we need to provide training not only to prospective teaching candidates but also to another category of teachers – those without any pre-service education already placed in schools. These teachers are already teaching, perhaps with some guidance, advice and support from their experienced colleagues. Their experience in terms of how children learn (in general and for a particular subject), classroom transactions and ground realities is valuable and cannot be replicated in any school experience program. Any program for their preparation must take that into account and use this experience. Further, their sheer

numbers in some states and the fact that they cannot be withdrawn from schools while they undergo training, forces us to consider modes of training different from the conventional B.Ed. and D.Ed. courses.

There always was a resistance to alternative modes of Teacher Training, that were not face-to-face, as it was argued (and justifiably so) that preparation of teachers and teacher educators required them to have a substantial dialogue with those who could expose them to a wider vision as well as theoretical foundations. Questions of how a teacher can utilize the diversity in her classroom; what knowledge (of education, philosophy including educational as well as social purposes, human learning and psychology, social dimensions including stratification, diversity and conflict as well as of specific disciplines) is required to be an effective teacher; how the community can play a role; and what is meant by terms such as child-centred, activity-based etc. need to debated among teachers but also require resource persons to guide the dialogue.

Face-to-face discourse was meant to build new capacities in teachers and consolidate their understanding of education, in alignment with the principles that were expected at any point of time. It provided scope for interaction not just with the teacher but also among student-teachers as well as room for group discussions and ctivities – both vital components of learning process not thought possible in distance mode. But, there is now reluctant agreement to the need of alternatives to face-to-face mode. Indeed, in many ways the lack of quality of face to face interaction, governed largely by the lack of appropriate resource persons has led to this conclusion. Since such quality resource persons required were unavailable therefore there was a reluctance to provide them with any space or autonomy to construct the engagement with teachers during teacher trainings. Forced to follow pre-designed packages and modules with little scope for innovation, the level of trainings deteriorated and led to such processes becoming a farce. From the search of quality resource persons, the emphasis has therefore shifted towards attempting to provide well-structured content to the teacher

educators and teachers across the country. The importance placed on presentation of coherent and conceptually grounded ideas to a wide audience is welcome. However, the requirements of some form of dialogue cannot be entirely overlooked. It is in this context that we need to think about the structuring of capacity building of teachers and ways of ensuring their continuous developmentwhich combines the elements of face-to-face with distance education.

Continuous teacher professional development
While the need for pre-service courses that are more than face to face has assumed recent significance - due to the several factors outlined above – in-service teacher programs have been advocating it for over two decades. This stems from the notion of building a discourse or dialogue around teachers' and teacher educators' ideas of education that have emerged through serious engagement with classrooms, with theoretical concepts and debates. Several of these ideas have been included in the National Curriculum Framework (NCF) 2005 and NCFTE 2009. It has been many years since these documents were made public yet the teacher training scenario, both in-service and pre-service, seems to have not responded to them in a significant manner.

Recent discussions on teacher development have not only emphasized pre-service preparation but mechanisms for supporting and motivating teachers subsequently as well. There have also been suggestions that instead of the entire period of teacher development been used up in the beginning or at one go, it should be interspersed with period of time spent on teaching. Further, to align the teacher development programs to the NCF 2005 necessitates a change in the following broad dimensions. These are:

1. The length, nature, scope and manner of organization of the time spent by the trainee teacher in the school (school experience program, SEP) as well as the classroom. Analysis of the purpose of SEP and a convergence of the different views held by the teacher educators.

2. A shift from emphasis on merely techniques and methods to concepts of childhood, diversity and inclusion, purpose and role of education.

3. To consider the nature and processes of human learning, the importance of dialogue imbued with mutual respect and to arrive at a shared understanding of the essential elements needed for it.

4. To help the teacher understand the nature of the subject, feel confident of the underlying concepts and ideas. Also understand the ways to help children develop concepts and feel confident in it.

Given the fact that most of the educators, existing programs, syllabi, modules and materials are oriented to the didactic way of teacher preparation and education, the challenge to achieving the above is huge. This has led to the need for providing opportunity to teachers and educators across the country for reflecting on their beliefs. To do this over wider regions a need has arisen to use techniques that are more than face to face.

It has been suggested that teachers should have opportunities for capacity building through programs; for practicing teachers to be able to access courses without having to take breaks from their teaching duties. There exist some courses of this kind that have been implemented in the past, others that exist currently and the learning from these that can be used in the design of new courses.

Continuous professional development programs – past and present

In the last two decades, the concept of capacity building for teachers has evolved from occasional trainings into continuous interactions and efforts to build systems to put this idea into practice. Many institutions have partnered with the SSA in order to provide opportunities for capacity building of teachers. Under some of the State specific programs (Lok Jumbish; Bihar Education Project; Education for all, UPE etc.) and subsequently the District Primary Education Program, spread over the entire country, effort was made to incorporate various dimensions of capacity building. Irrespective of the program under consideration, reviews have identified the lack of resource persons as a major bottleneck in implementation, expansion and success. Institutions that can serve as platform for engaging with the learning needs of teachers in a continuous manner are also missing. The in-service programs have often focused on buzz words and have not been able to engage teachers in a meaningful and challenging manner.

Many States have recently introduced Certificate programs offered by Open Universities, in particular by Indira Gandhi National Open University (IGNOU) in an attempt to enrich teacher capacity building efforts. The course, teaching of primary mathematics (comprising of AMT01 and LMT01) has seen significant attention. However, the structured counselling and consultation provisions demanded by the course are missing, making it impossible to provide teachers with feedback on assignments or guide them about the spirit and purpose of this course. This highlights the need not just for other such meaningful courses for in-service capacity development, but more importantly for support required for these programs to be relevant. While we have institutions like IGNOU, ELTI and a few others who can devise programs, there is a lack of support structures. Further, looking at the size and variety of the teaching force, the gap between the need and availability of courses is extremely large. Organizations outside the government structure have developed some meaningful programs and mechanisms for interaction with teachers, but have not yet been able to come up with processes that can be take them to scale without loss of quality.

What is needed

The need for expanding the opportunities for learning had been recognized many years ago but what has emerged from the efforts towards achieving this is the need to develop programs that have a solid grounding in foundational ideas of education, its nature and disciplinary knowledge as well as concrete ideas of what can be done in the classrooms and schools. We require structures where these programs will be housed (resource centres) and where the teachers

can contact peers as well as more knowledgeable discipline experts; people who can enthuse teachers and ensure that they can continue to learn. The interaction between people at the resource centers and the teachers who come to get exposure needs to be non-didactic, open ended and conversational. The teachers should not come expecting lectures or simple solutions to their problems provided by the resource person. Instead, the centres should be a space where they can interact with their peers and discover their own solutions and resources. Solutions that are informed by their experience of the context of their school, children in it, the materials available to them physically, emotionally as well as intellectually and knowledge of what including materials and ideas children would be comfortable with.

As discussed in previous sections, earlier programs depended largely on face-to-face interaction with resource persons who were inspirational and confident. The success of the program and their scaling, were both hindered by shortage of such persons. Therefore, we now require programs with quality materials and processes that are accessible to all teachers and do not overly rely on the facilitator. Much of the material for these programs is available in the form of material designed by NIOS, IGNOU, ELTI and other agencies although it needs to be restructured and contextualized. For example, the language material of one state may not only need to be translated using appropriate idiom and expression but it would also need suitable examples inserted to replace earlier ones, before it can be used in another state. Careful scanning and editing is required rather than mere translation for the material to make sense when transposed into another setting.

Quality material that is simple for the teachers to understand and is based on real experience of classrooms is required. It should be able to engage the teachers giving them opportunity to think. The materials available should address the experience of the teachers and not negate it. The suggestions provided must be of doable tasks that have been tried out and seems to be workable. In brief, what is required is having a learning and

meaningful system that brings the desire of the teacher to learn alive.

More pressing is the need to build processes and structures to avoid the failures faced by earlier programs. There have been many massive scale orientation programs for teachers since the 1980's. These have suffered from the lack of institutional capacity to host good programs both logistically and in terms of content and proccesses as well. The brief attempts in some of the state level efforts at specific times not-with-standing, there has been very little attempt to correct this. It always appears that the resources allocated, the timing of the sanctions and their release pattern is always behind the requirements at that time. There seems to be an inability to plan an intervention slowly and systematically. There seems to be a pressure to cover all at the same time resulting in inadequate inputs that therefore get wasted. The challenge thrown by RTE 2009 should be taken as an opportunity to design processes and programs that will provide pre-service training to teachers in school while simultaneously achieving the goals of education outlined by NCF 2005 and NCFTE 2009.

To be able to explore and begin the process of reflection and learning in teachers, we require engagement that would comprehensively expose the teacher to alternative ways of looking at education, purpose of education as well as nature of the subject and concepts in it. They would also be required to appreciate the capability of the child, the diversity of the background they come from and recognize the need for equity in terms of the opportunities we provide to all children. Within this broad contour, teachers need specifically identify the individual small changes that they can make in the functioning in their classrooms, and in their relationships with children and the community. They need to be become excited about the subject that they teach and develop the confidence that they can learn more in it. This is certainly not a simple process and cannot be done by making a scheme.

To achieve this, we need to build a program that has the possibility for multiple levels of interventions with a clear focus on where we want to go. Everyone engaged in the process

needs to feel positive about her role and develop the confidence and competence to perform it with authority and pleasure. This requires a continuously learning system with structured and unstructured dialogues with people of similar and different experience basis. This also requires processes where there is a space for participants to explore, make small mistakes and have the opportunity to recognize these mistakes and the opportunity to learn how to correct it.

Emerging ideas and mechanisms

The deliberations held in the 3 teacher development seminars in which MHRD was a participant, underlined the need for building such processes and recognizing the institutions that could help in taking the leadership role to make all this possible. The seminars explored comprehensive teacher development and management to be followed by further detailed discussions on pre-service and in-service elementary teacher education. Participants to these included those who were concerned with teacher education and development from across the world and also many who are working in India for decades, trying to seek answers to the multi dimensional challenges of teacher preparation, development, motivation and performance. A common concern voiced across the three seminars was the need for continuous teacher preparation as opposed to disjointed pre-service and in-service programs. Further, they emphasized the need for multiple avenues of teacher education, multiple points of entry into the profession and more programs along the lines of the B.El.Ed program offered by DU or MA Elementray education offered by TISS. The dialogue also brought out the advantage and thus re-emphasised the need to increase participation in the academic resource institutions, both officially and non-governmental, in partnering with the State Education Department and the academic bodies at State and National level responsible for improving the quality of education.

There are signs of such partnership in some of the States. Some of these partnerships existed earlier and there are signs for some more developing. It is important to work towards development of possibilities to encourage such

possibilities and consolidating them so that they can support interventions made by the State education system. The state of Chhattisgarh, in order to be able to provide pre-service training to untrained teachers, has seen partnership between the State educational team and non-governmental resource agencies on multiple occasions. Earlier there was a lack of centers where teachers could collect and get a chance to interact with each other and with those who could act as facilitators and provide input for their further learning. Centers have been set up at the moment to cater to the open and distance D.El.Ed. program and are functioning for this specific purpose but the plan is to make these permanent learning centers for teachers and have a large team available at the center to make it possible for the teacher to receive support when she needs.

The idea of these centers functioning as centers for continuous learning would need constant attention. The materials and the facilities at the center would have to be strengthened and up-graded. The persons engaging teachers at the center would need to be kept fresh, motivated and exposed to new learning and new ideas. For this, they themselves will need to undergo frequent and regular trainings and meetings at the central level where they can share their experiences which can be used to enrich and modify the program. They would need to have access to each other as well as to resources. They would also need to be in touch with persons who are known to be knowledgeable in that domain. The accessibility of sources of knowledge would have to be improved and their numbers increased. Right now these are largely DIETs and Sr. secondary schools. The facilities and capabilities at these institutions do not allow for many more to be considered. There is a need to both improve the facilities at the existing centers and identify more of them. Competently and carefully organised engagements with persons from school system have always drawn full interest and participation. There is keeness to be respected and to do well among most teachers. The ingredients for this seem to be a diverse set of capable people working in close tandem. Creation of relevant materials imbued with

current knowledge on education developed and shared in the vernacular language and local idiom.

The fact that over-rides all this is a consistent interest in this endeavour and space to use available resources meaningfully and autonomously. The defining of the nature of the interaction at an optimal and doable level and then ensuring that what is planned happens. The danger of stating much more that what can be made possible leads both to depression and to hypocrisy. Given the goals of making the teacher and the educator an autonomous learner it is not so much that correct explanations have to be given to her but rather her capability of formulating her own logic and seeking relevant ideas for her self are necessary. She, of course, needs to be exposed to or rather immersed in the aspects of education outlined above but all that within a framework that respects her as a person in all dimensions of her existence as a teacher or an educator. It should focuss on building capabilities with enablement with access to sources for more learning. Expanding vistas to develop the interest to seek new questions and explore answers in order to also create newer ways of thinking. Education is not about transmitting edicts and information or even known concepts and ideas, it is about seeing excitement for new knowledge in whatever is a part of human endeavour. It is thus important that we create capability, desire and possibilities for teachers to constantly engage with themselves and their knowledge and share the joy of this engagement with their students.

रजनी द्विवेदी

छत्तीसगढ़ के डी.एड. पाठ्यक्रम में बदलाव

पृष्ठभूमि

छत्तीसगढ़ में नियमित डी.एड. हेतु पाठ्यक्रम निर्माण का कार्य वर्ष 2008 में शुरू किया गया। पाठ्यक्रम में बदलाव क्यों किया जाय इसके कई कारण थे। पिछले कई वर्षों से एक पाठ्यक्रम चल रहा था। लेकिन यह पाठ्यक्रम नए राज्य के गठन के बाद बनी नयी पाठ्यपुस्तकों के अनुरूप नहीं था। विभिन्न मंचों पर शिक्षकों के साथ हुई अन्तःक्रियाओं में यह महसूस किया गया कि पाठ्यक्रम शिक्षकों को सैद्धांतिक ढांचा तो प्रदान करता है लेकिन कक्षा–कक्ष की वास्तविक स्थिति में किस तरह काम करना है यह समझने में खास मदद नहीं करता। इसके अलावा, वर्ष 2005 की राष्ट्रीय पाठ्यचर्या की रूपरेखा का दस्तावेज शिक्षा क्यों, शिक्षा कैसे व किसके लिए जैसे मूलभूत प्रश्नों के बारे में एक नया दृष्टिकोण देता है। एन.सी.एफ. 2005 के आधारभूत सिद्धान्तों व उसकी अनुशंसाओं के प्रकाश में इस पाठ्यक्रम को पुनः देखने की आवश्यकता थी।

पाठ्यक्रम के अवलोकन के दौरान यह भी पता चला कि नियमित डी.एड. हेतु पाठ्यक्रम की कोई ठोस रूपरेखा (फ्रेमवर्क) व उपयुक्त पुस्तकों की सूची अथवा पठन सामग्री उपलब्ध नहीं थी। यह तो पता था कि क्या विषय पढाए जाने हैं लेकिन यह स्पष्टता नहीं थी कि यही विषय क्यों पढाने हैं?, क्या सन्दर्भ पुस्तकें होनी चाहिए?और छात्र शिक्षक से क्या अपेक्षाएं हों व क्यों?

इसी तरह पढ़ने–पढ़ाने के तरीके भी व्याख्यान आधारित थे (जबकि छात्र शिक्षक से अपेक्षित था कि वह कक्षा में कुछ नया करे व फरक करे) और मूल्यांकन भी इसी समझ पर आधारित था यथा मूल्यांकन यही जांच करता था कि छात्र शिक्षक द्वारा दी गयी सूचनाओं का पुनः प्रस्तुतीकरण कितनी अच्छी तरह से कर पाते हैं। इन सभी संदर्भों, सरोकारों व चिंताओं के मद्देनजर वर्ष 2008 में एस.सी.ई.आर.टी. व सहयोगी संस्थाओं एकलव्य (भोपाल), दिगंतर (जयपुर) व विद्या भवन सोसाइटी (उदयपुर) के संयुक्त तत्त्वावधान में आई.सी.आई.सी. आई. के सहयोग से सेवा पूर्व शिक्षक–शिक्षा के नियमित डी.एड. पाठ्यक्रम निर्माण का कार्य शुरू किया गया। 2009 में प्रथम वर्ष हेतु पाठ्यसामग्री निर्माण का कार्य पूरा हुआ व डी.एड. संस्थानों में लागू भी हुआ व द्वितीय वर्ष की पाठ्यसामग्री पर कार्य शुरू हुआ।

इसी दौरान वर्ष 2009 के अंत में शिक्षा का अधिकार कानून भी लागू हो गया। जैसा कि विदित ही है यह कानून मांग करता है कि विद्यालयों में सभी शिक्षक प्रशिक्षित हों। राज्य में उस वक्त लगभग 45000 शिक्षक ऐसे थे जिन्होंने कोई औपचारिक प्रशिक्षण नहीं प्राप्त किया था, और शिक्षा के अधिकार के तहत यह राज्य की जिम्मेदारी बन चुकी है कि शिक्षकों को प्रशिक्षित किया जाये।

अतः यह भी जरूरी था कि अप्रशिक्षित शिक्षकों के प्रशिक्षण का यह कार्य जल्द ही शुरू किया जाय। चूंकि ये शिक्षक स्कूल में कार्यरत हैं और प्रशिक्षण के लिए वे स्कूल का पूरा कार्य नहीं छोड़ सकते। उन्हें बार–बार विद्यालय से हटाना संभव नहीं है और क्योंकि छुट्टियां भी पर्याप्त नहीं है, इसलिए एक ऐसे माध्यम की आवश्यकता थी जिसमें कि शिक्षक स्कूल में कार्य करते हुए प्रशिक्षण प्राप्त कर सके व उससे लाभान्वित भी हो सके। तभी यह विचार आया कि नए विकसित किये गये नियमित डी.एड. के पाठ्यक्रम में ही इन शिक्षकों की वर्तमान भूमिका व आवश्यकता को देखते हुए संशोधन किये जाएं (और ऐसा हुआ भी)। साथ ही एक ऐसा सिस्टम बनाया जाय जिससे ये स्कूल में कार्य करते हुए न केवल प्रशिक्षित हो सकें बल्कि इस प्रशिक्षण से उन्हें स्कूल को व स्कूल में किये जाने वाले कार्यों को बेहतर करने में मदद मिले। एक पहल यह भी थी कि इस तरह के प्रशिक्षण से शिक्षकों की पढ़ने लिखने की निरंतरता को बनाए रखने में भी मदद होगी और शिक्षकों के सीखने को आगे ले

जाया जा सकेगा।

अतः यह कहा जा सकता है कि एक तरह से सेवारत शिक्षकों हेतु पाठ्यक्रम निर्माण का कार्य वर्ष 2009 में ही शुरू हो चुका था। शिक्षक तैयारी के इस कार्यक्रम के बारे में आधारभूत चर्चाएं यथा पाठ्यक्रम में क्या बदलाव हो, क्यों हो, और इन्हें कैसे लागू किया जायेगा, पाठ्यक्रम की विषयवस्तु में क्या–क्या हो, सामग्री कैसी हो, आकलन की प्रक्रिया क्या हो, पाठ्यक्रम के उद्देश्य क्या हों इत्यादि के बारे में चर्चा तभी से शुरू हो चुकी थी। सेवारत शिक्षकों के लिए तैयार किये गए वर्तमान पाठ्यक्रम को स्वरूप देने में इन चर्चाओं से बहुत मदद मिली।

इस लेख के तीन हिस्से हैं जिनमें अप्रशिक्षित सेवारत शिक्षकों के लिए औपचारिक प्रशिक्षण तैयारी उपलब्ध करवाने के प्रयास की झलक है।

पहला हिस्सा पाठ्यक्रम के उदेश्य के बारे में है तथा दूसरा पाठ्यसामग्री चयन के आधारों के बारे में। तीसरा हिस्सा, कार्यक्रम के क्रियान्वयन के लिए क्या क्या व्यवस्थागत प्रयास किये गए हैं इस सन्दर्भ में है।

पाठ्यक्रम के उद्देश्य

शिक्षक शिक्षा के लिए उपलब्ध अधिकांश पाठ्यक्रमों के केंद्र में कुछ विशेष शिक्षण सिद्धान्त व उनका शिक्षण है। ये सिद्धांत काफी पुराने हैं और इनका शिक्षण भी इस तरह से किया जाता है कि इनमें सोचने की गुंजाइश न के बराबर रहे। छात्र शिक्षक जो कहा गया है उसको माने, जो बताया गया है वही कक्षा में करने का प्रयास करे, चाहे यह शिक्षण की विधियों के बारे में हो, बच्चों के व्यवहार के बारे में हो या फिर समाज की स्थिति के बारे में। छात्र शिक्षक हो या सेवारत शिक्षक, शिक्षक शिक्षा के पाठ्यक्रम के अंतर्गत वे स्कूलों में समय जरूर बिताते हैं लेकिन उसमें हासिल अनुभवों को सिद्धान्तों के प्रकाश में नहीं देख पाते। अपने अनुभवों पर चिंतन करना और अपने विश्वासों कों व्यक्त करने, उनकी जांच करने की उनसे अपेक्षा नहीं होती। शिक्षक प्रशिक्षण कार्यक्रम का एक मुख्य

उद्देश्य यह होना चाहिए कि वह सिद्धांत व व्यवहार की दरार को पाट सके, छात्र शिक्षक व सेवारत शिक्षक पढ़े गए सिद्धान्त की समझ को अपने स्कूल अनुभव कार्यक्रम के दौरान उपयोग कर पायें और साथ ही यह भी समझ पाएं कि दिए गए सिद्धांत किस सीमा तक उपयुक्त हैं।

अपेक्षा तो यह भी होनी चाहिए कि वे अपनी समझ के आधार पर अपने सिद्धांत व उनमें अन्तर्निहित विरोधों को भी देख पाए।

शिक्षक तैयारी पाठ्यक्रम का उद्देश्य यह था कि छात्र शिक्षक जमीनी हकीकत से गहराई से रूबरू हों और उसे समझ पाये। साथ ही साथ यह भी समझे कि उस हकीकत के साथ किस तरह काम किया जाए। पाठ्यक्रम छात्र शिक्षकों को इस तरह तैयार करे कि वे स्वतंत्र रूप से सोच सकें, परिस्थितियों के अनुसार सही निर्णय ले सकें, उनसे निपटने के विभिन्न तरीके सोच सकें।

उदेश्य यह भी था कि छात्र शिक्षक व सेवारत शिक्षक बच्चों, उनकी पृष्ठभूमि और वर्तमान सामाजिक सन्दर्भ को शिक्षा के दर्शन के सन्दर्भ में समझ पाए। वे अपनी मान्यताओं से जूझ पाएं व उन्हें उन लक्ष्यों व मूल्यों के अनुरूप बना पाएं जो हमारे संविधान, शिक्षा नीतियों व पाठ्यचर्या के दस्तावेजों में निरूपित है। इस कार्यक्रम का एक उद्देश्य यह भी होना चाहिए कि पाठ्यक्रम द्वारा छात्र शिक्षकों में स्वयं पढ़ने की प्रवृत्ति विकसित हो व धीरे धीरे वे पढ़ने को अपनी एक आदत बना पाएं, जो कि एक शिक्षक होने के लिए आवश्यक है।

पाठ्यक्रम निर्माण

शिक्षक शिक्षा के दो वर्षीय डिप्लोमा कार्यक्रम के निर्धारण व उसके पढ़ाए जाने के ढंग के बारे में व्यापक चर्चाएं हुई और इनमें बहुत से लोग जुड़े। इसमें शिक्षा के उद्देश्यों पर चर्चा हुई। पाठ्यक्रम में क्या–क्या शामिल हो व किस प्रकार शामिल हो इस पर भी चर्चाएं हुई। ऐसा माना गया कि पाठ्यक्रम ऐसा हो जो शिक्षक को शिक्षा व उसके विभिन्न आयामों को समग्रता से देखने में मदद

करे। व्यापक चर्चाओं के बाद निम्नलिखित क्षेत्र पहचाने गए :–

1. आधारभूत विषय : इसमें इस तरह के मसले शामिल हैं– शिक्षा क्या है, शिक्षा के उद्देश्य, शिक्षा किस–किस के लिए, इंसान की प्रकृति व शिक्षा, ज्ञान, ज्ञान के प्रकार व उनके आधार, उनके गुण व विभिन्न प्रकारों के बीच अंतर्संबंध, शिक्षा व समाज का रिश्ता, वर्तमान भारतीय समाज की रचना व उसकी प्रमुख चुनौतियाँ क्या है, उसकी क्या विशेषताए है क्या समस्याएं हैं, इस समाज का वैश्विक परिवेश से संबंध, बच्चे, बचपन, बच्चों के सीखने–सिखाने की प्रक्रियाएं आदि।

2. दूसरे क्षेत्र में सम्मिलित है स्कूली विषय व उनको सीखने–सिखाने की तैयारी यथा भाषा व भाषा शिक्षण, गणित व गणित शिक्षण, पर्यावरण व पर्यावरण शिक्षण, कला व कला शिक्षण।

3. तीसरा क्षेत्र है स्कूल चिंतन मनन कार्यक्रम : स्कूल चिंतन मनन कार्यक्रम इस पाठ्यक्रम का सबसे महत्त्वपूर्ण हिस्सा है। चूंकि यह उन शिक्षकों के लिए है जो स्कूल में कई वर्षों से कार्यरत हैं और जिन्हें स्कूल का, उसकी विभिन्न परिस्थितियों का अच्छा अनुभव है।

अतः कार्यक्रम का मुख्य उद्देश्य है कि कार्यरत शिक्षक अपने स्कूल के पूर्व व वर्तमान अनुभवों को व्यवस्थित कर पायें। एक निश्चित विषयवस्तु को पढाने की शिक्षण योजना बनाने से आगे बढकर अपने द्वारा रोज किये जाने वाले कार्यों के बारे में समग्र रूप से सोचें व योजना बनाएं। वास्तविक स्थिति में ऐसा ही होता है शिक्षक को एक ही कालांश और एक ही विषय नहीं पढ़ाना होता बल्कि एक से ज्यादा विषय पढाने होते हैं तथा पूरे दिन बच्चों के साथ ऐसे कार्य करने होते हैं जिससे कि बच्चे व्यस्त रहें, सीखें। इसके अलावा यह भी महत्त्वपूर्ण है कि वे किये गए कार्यों के बारे में, इस दृष्टि से सोचें कि जो उन्होंने किया उसमें बच्चों की भागीदारी, उनके लिए आनंद, सीखने की मात्रा व गहराई का पुट कितना–कितना था। वे यह भी सोचें कि जो आज किया उसके आगे अगले दिन क्या करें और इसे कैसे करें कि कार्य पिछले दिन से बेहतर हो सके। यह आशा है कि धीरे धीरे सोचने कि यह प्रक्रिया रोज़ स्कूल में उनके काम करने की प्रक्रिया का हिस्सा बन सकें। उद्देश्य यह भी था कि

अध्यापक अपने स्कूल, स्कूल जहां स्थित है उस समुदाय गांव मोहल्ले की पृष्ठभूमि को, बच्चों व उनकी रुचियों को भी पहचाने और यह भी जाने कि इस जानकारी को उन्हें कैसे प्राप्त करना है व इसका सीखने–सिखाने में क्या–क्या महत्त्व है। इस हेतु संबंधित सन्दर्भ मार्गदर्शिका में उपलब्ध भी कराये गए।

पाठ्यवस्तु के चयन के साथ–साथ यह प्रश्न भी था कि पाठ्यवस्तु का प्रस्तुतीकरण कैसे होगा?सभी विषयों के मध्य एक जुड़ाव है और यह जुड़ाव दिखे व अध्ययनकर्ता को महसूस हो यह एक महत्त्वपूर्ण बिंदु है। डी.एड. दूरस्थ शिक्षा का पाठ्यचर्म मूलतः उन शिक्षकों के लिए बनाया गया जो वर्तमान में स्कूलों में कार्यरत हैं व जिन्हें स्कूल में कार्य करने का अनुभव है। कार्यक्रम बनाते समय उनकी रुचि, उनके पास उपलब्ध समय, उनकी क्षमताओं, उनकी पढ़ने की आदतों को ध्यान में रखते हुए विषयवस्तु को प्रस्तुत करने का प्रयास किया गया। यह प्रयास करने के लिए कि उनके पढ़ने की क्षमता बढ़े, पठन सामग्री की शुरुआत में संक्षिप्त में परिचय दिया गया कि यह पाठ क्या समझने में मदद करेगा। पठन सामग्री के बीच–बीच में ऐसे प्रश्न दिए गए जिससे उन्हें महत्त्वपूर्ण बातों पर दुबारा ध्यान देने का मौका मिले। यह प्रयास था कि अध्ययनकर्ता स्वयं आकलन कर पाए कि वह पढ़ी गयी / गए विषय वस्तु को समझा है अथवा नहीं। समझने में मदद के लिए कई कदम उठाये गए। जैसे– ज्यादा क्लिष्ट पर महत्त्वपूर्ण पैराग्राफ को पुनः बॉक्स में लिखकर समझाया गया, संबंधित उदाहरण दिया ताकि क्या कहा जा रहा है किस परिप्रेक्ष्य में कहा जा रहा है यह समझ आ सके। मुख्य बातें जिन पर फोकस करना है उन्हें बोल्ड किया गया तथा पाठ के अंत में कई जगह सारांश दिया गया।

तीसरा हिस्सा मूल्यांकन का था। अक्सर मूल्यांकन में याद करने व रटने पर ज़ोर होता है। पुराने डी. एड. कार्यक्रम में सामान्य धारणा थी की पासबुक व कुंजियों से पढ़ो व पास हो जाओ। यहां जोर था कि लोग पढ़ें, समझ बना पायें व पढ़ी हुई सामग्री पर मनन कर पाएं व आगे बढ़ पाएं। प्रयास यह भी था कि मूल्यांकन भी उनकी उसी समझ का हो।

स्कूल चिंतन व मनन कार्यक्रम के लिए और विभिन्न विषयों के लिए मूल्यांकन की प्रक्रिया में थोड़ा फरक होना अवश्यम्भावी है। स्वमूल्यांकन स्कूल चिन्तन व मनन कार्यक्रम का महत्त्वपूर्ण हिस्सा है। स्वमूल्यांकन की प्रक्रिया शिक्षकों को अपनी आगे की योजना बनाने में मददगार होती है, अतः अपेक्षा है कि शिक्षक पाठ्यक्रम के उपरान्त भी स्वमूल्यांकन की इस प्रक्रिया को बरकरार रखेंगे।

पढ़ी हुई सामग्री के बारे में गहराई से सीखने व सोचने के मूल्यांकन हेतु आवश्यकता थी अच्छे प्रश्नों, असेसमेंट व टास्क की। यह ऐसे होने की अपेक्षा है जिनका जवाब देने के लिए उनका काम सामग्री पढ़कर सिर्फ उसे नकल करने से नहीं चले वरन सामग्री को समझ कर, उसका विश्लेषण करते हुए, अपने अनुभवों से जोड़ते हुए जवाब देना हो। मूल्यांकन कैसे किया जाय, उसके लिए क्या तैयारी हो, यह अपने आपमें बड़ी चुनौती है। स्वयंपाठी कार्यक्रमों में कोर्स के पाठक के साथ संवाद व उसके कार्य पर फीडबैक मिलना बहुत कठिन होता है। स्कूली अनुभव में डूबने की समग्रता के बावजूद अच्छी सामग्री, अच्छे अभ्यासों व समय पर सार्थक फीडबैक के अभाव में यह सब निरर्थक ही हो जाता है।

पाठ्यक्रम का क्रियान्वयन
इस वर्ष लगभग 10000 अप्रशिक्षित शिक्षकों ने इस कोर्स के लिए नामांकन कराया है। अगले वर्षों में लगभग 35000 और शिक्षक इससे जुड़ेंगे। इस कार्यक्रम के लिए पूरे राज्य में विभिन्न जिलों में

ब्लॉक स्तर पर 100 केंद्र बनाये गए हैं। ये केंद्र या तो डाइट में है अथवा किसी सीनियर सैकण्डरी स्कूल में, जहाँ एडुसेट की व्यवस्था है, ताकि समय–समय पर केंद्र की टीम से बात की जा सके व उनकी मदद ली जा सके। केंद्र पर अकादमिक व प्रबंधन कार्यों के लिए सक्षम व उपयुक्त डिग्री हासिल किये 14 लोगों की एक टीम नियुक्त की गई है। टीम के लोगों के चयन का आधार उनकी इस कार्य में रुचि तथा उनकी शैक्षणिक योग्यता (एम.ए. एवं एम.एससी. के साथ एम.एड.) था। प्राथमिकता उन व्यक्तियों को दी गयी जो सैकण्डरी, हाई स्कूल में शिक्षण का कार्य कर रहे हैं अर्थात् जिन्हें शिक्षण का अनुभव है व उसी ब्लॉक में कार्यरत हैं, जहां केंद्र स्थापित किया गया है। चयनित व्यक्तियों को पाठ्यक्रम के आधारभूत सिद्धांतों, उसके उद्देश्यों व पाठ्यसामग्री से परिचित करवाने व उसे समझने हेतु सभी विषयों हेतु अलग–अलग कार्यशालाएं आयोजित की गईं। वर्तमान में केन्द्रों पर कार्य शुरू हो चुका है। एक व्यक्ति को दो चरणों में 14 दिनों का ठोस आमने–सामने प्रशिक्षण दिया गया। इसके दौरान उनको भागीदारी का भरपूर मौका था ताकि वे भी शिक्षकों के साथ आमने–सामने संपर्क कक्षाओं के दौरान भागीदारी व खुलेपन का महत्त्व पहचान पाएं। इस सामग्री को तैयार करने व प्रशिक्षण देने हेतु बहुत सी संस्थाओं व व्यक्तियों ने मिलजुल कर काम किया। विविध सरकारी संस्थाओं की भागीदारी ही कठिन होती है किन्तु इस साझे प्रयास में न केवल सरकारी बल्कि कई गैर–सरकारी संस्थाओं ने मिलकर कार्य किया व कर रही हैं।

Kumud Purohit

A report of the
Philosophy of Education seminar organized by the Azim Premji Foundation

Abstract

An international seminar was organized by Azim Premji University on "Philosophy of education" held at Bangalore on 23-25 January, 2013. The seminar was the culmination of a series of regional seminars held in Dehradun, Pondicherry and Jaipur, in which 28 papers were presented.

Introduction

Philosophy of education (PoE) has been a part of its sailent features the curriculum designed for degrees offered in the field of education, especially teacher education, in India. However, a closer examination of the content of this curriculum would soon reveal that courses in philosophy of education thin themselves into recitation of names and 'opinion' and seem to appear disconnected with the rest of the curriculum.

The persistence of this image of philosophy of education forecloses the possibility of utilizing the analytical tools that philosophy offers in scrutinizing assumptions and concepts, defining frameworks and terms, examining justification, implications and normative foundations. *What is lost sight of here is the need to carry over the habits of thought as a tool.*

The syllabi at various teacher education institutes and for training programs at different levels, while claiming to be receptive to the needs of an inevitable interdisciplinary approach, seem to offer little and in some cases almost nothing to ground the concerns raised by the theoretical foundations that form the matrix of such an inter-disciplinarity.

The inclusion of these disciplines, as a resources to draw from, seems to pull the programs in myriad directions and lack of emphasis on introducing a set of conceptual tools to ground these approaches merely add to the mounting issues.Through the present seminar, Azim Premji

University has tried to rejuvenate the task of opening the possibilities philosophy of education has.

The seminar served the following purposes:-

a) Take stock of trends and character of work that has been done in other parts of the world.

b) Provide exposure to leading contemporary figures in philosophy of education to practitioners in the country.

c) Explore the possibility of articulating a philosophy of education drawing from indigenous traditions in the country.

d) Provide a platform for individuals to pursue their interests in philosophy of education, present their work and imitate discussions.

The event - day one

The International seminar was an event where established scholars in the discipline from across the world made presentations on the current issues in PoE. Through this seminar debates in philosophy of education world over were connected to the Indian Scenario and a significant number of academics in India were brought together. A total of 23 papers, spread over 6 sessions, by established scholars in the discipline from across the world, reflected and generated a body of knowledge about the philosophy of education.

Prof. Rohit Dhankar of Azim Premji University introduced the Seminar and the Programme Structure. Prof David Carr. University of Edinburgh, UK in his paper reflected about the concept of education. In the first part of his paper, he discussed about confusions of different senses

about different conceptions of education. In the second part of the paper he identified several different conceptions of education, between egalitarian and non-egalitarian aims of education, between instrumentalist and non-instrumentalist purposes of education, between the roles of schooling in promoting both conformity and independence and between different views of the educational value of schooling. In terms of these tensions Prof. Carr's paper also identified six competing conceptions of education as schooling, namely, Platonic or elitist traditionalism, liberal egalitarian traditionalism, utilitarian traditionalism psychological (psychoanalytic) progressivism, pragmatist (instrumental) progressivism, and educational radicalism or deschooling.

Prof. Krassimir Stojanov, Catholic University Eichstatt, Gemany reconstructed the distinctions and interrelations between two quite different meanings of the term 'Education'– "the human development" and "as teaching". Prof. Krassimir discussed the concepts of education of Dewey and Peters, who failed to draw a clear analytical distinction between the two meanings of education introduced the Hegelian theory of Building as a theory of the development of the human ability to participate in the universal logical space of world that consists of concepts and of inferences between concepts, that is, of arguments. To inhabit this space, transformation of one's own beliefs to conceptual contents and assessing the validity of these beliefs by articulating them in argumentative discourses is needed. Hence, for teaching to be educationally supportive, he demanded teachers to acknowledge empathetically the precognitive beliefs and ideals of students and encourage students to articulate conceptually these beliefs and ideals by involving them in practices of public reasoning.

Professor John White, University of London, UK discussed "An Amines-based curriculum" by which he showed that by beginning with general aims that equip each learner to both lead a personally fulfilling life and help others do so too. Specific aims to be derived from these to cover the personal qualities, skills and understanding needed for a life of personal, civic, and vocational well being. Mina O'Dowel, Associate Professor, Lund University, Sweden presenting a brief summary of the History of Human capital theory discussed how its underlying assumptions contrast to the philosophy of education.

The paper presented by Cludia Suhumann argued for a return to the critical core of the cosmopolitan idea and also that the critique of reification can serve as a vital tool for re-imagining the cosmopolitan teacher education as a critique. Her paper also focused on how educational Institutions can provide, strengthen, and enhance the conditions for binding ourselves as citizen of the world in non-reifying ways.

Roop Rekha Verma, former Vice-chancellor, Lucknow University, highlighted the need to revisit some older conceptions of the aims and nature of education and examine if education can still be resorted as a tool for humanizing the society. She also suggested education as a tool for peace to be molded as to became an instrument of ameliorating conflicts of different kinds of identities and interests.

Alok Mathur, Head, Rishi Valley Institute for teacher education reflected upon 2 interconnected and generative notions deriving from Krishna Murti's educational work; 'philosophy in practice' and 'school as a center of inquiry'. His paper attempted to place these notions in the wider framework of the calls for educational reform and renewal in the 21st Century.

Days two and three
Prof. D.C. Phillips, Stanford University, California, expressed his concerns about the criticisms of mainstream epistemology raised by those academics who believe that it is a tool used for the domination of minority groups. His paper described the most common misunderstandings about epistemology, and pointed to the important epistemological issues in education research and the field of policy.

Prof. Arindam Chakraborty, and Dr. Benjamin Zurk, University of Hawaii, Manoa, U.S.A. pondered upon the paradox faced by the educators of philosophy between authority of

teacher's intelligence and autonomy of learner through inquiry which is a demand of rationality, and which gives us the skill of questioning the authority. The paper also discussed about Radhakamal Mukherjee's description of Vedic Upanishadic pedagogy, J. Krishnamurthy & St. Augustine who agree with Rancere's radical claim about teacher's intelligence radical claim about teacher's intelligence standing between subject and pupil's own mind was critically examined in the paper.

Prof. Padma Sarangapani of TISS, Mumbai in her presentation explored the concept of culture as relevant to education discussion and advocated to build a Susangati learning culture' which involves primarily learning social ordering that simultaneously constitute person and society.

Mr. Hriday Kant Dewan of Vidya Bhawan Society, Udaipur raised several pertinent questions including what the school should attempt to do, how it should proceed and what should be the elements. It should emphasise, what can the school, as an externally structured formal system, do for children and their choices. He also explored the attempts at infusing development of moral, experiences, reasoning and choices through the school, and the basis and constraints for choosing these. Avinash Kumar, M.A. (Edu.) student from Azim Premji University discussed the positive of 'philosophy of education' in the syllabi of teacher education programmes in India, presenting the results and analysis of survey of the B.Ed. syllabi of 11 Indian Universities. His paper highlighted the limitations of the traditional approach and underscored the relevance of some salient features of analytical approach for contemporary teacher education, by showing its congruence with the 'visions' of teacher in NCF, 2005 and NCFTE 2010.

Prof. Dina Kuhlee, Humboldt University Berlin, Germany in her paper provided an overview of the German teacher education structures its legal contexts with regard to the role of the state in education, and its embeddedness in the rationalities of teaching as a profession. Her paper introduced some recent developments and problems in German Initial teacher education, and presented some contrasts with the situation in England and its most recent shifts into a "craft

of philosophy" of teaching. Prof. Christopher Winch, Kings college, London. Outlining three influential conceptions of teachers, as craft workers, as executive technicians, and as professionals and related these to different models of initial teacher education. He also presented the anglo German perspectives with reference to their relevance to the contemporary Indian policy scene.

Prof. Rohit Dhankar, Azim Premji University critically discussed the foundation versus integrative approach to and scope of theoretical knowledge in NCFTE and ETE (Elementary Teacher Education Programme) and suggested an interconnected disciplinary approach.

Prof. Amitabha Mukherjee, University of Delhi, inquired into the nature of mathematics arguing that engagement with nature of mathematics is important for those who teach mathematics. He also raised questions about what makes maths difficult or unique.

Vijaya S. Verma, Ambedkar University, Delhi stressed upon the necessity to revisit the methods and philosophy of science since it has no absolute truths and is a process always information.

Mr. Kamal Mahendroo, VBERC- Critically examined the concept of constructivism from various philosophical perspectives. His paper also tried to examine the impact and implications for the practice of Science teaching, in Indian context.

Prof. Sundar Sarukkai, Manipal University explored how perspectives on science drawn from Indian experiences can contribute to the interface between history and philosophy of Science (HPS) and Science Education (SE). He also discussed definitions and nature of science to be the challenges that needed philosophical intervention. His paper suggesting how philosophy of science can be relevant for science education, aimed to make both HPS and SE more sensitive to other cultural formulations of science and scientific method.

Mr. Richard Pring, Oxford University- this paper analysed what could be meant by an educated

person, so that education could be placed more within the realm of ethics than in that of social sciences. He also drew through his paper some of the consequences for educational policy, practice and research, with particular reference to language of education, pursuit of higher standards, assessments of standards through testing, false dualism between 'academic' and 'vocational' and the practice of teaching. Thus he raised a significant question about the importance of philosophical issues for educational research.

Prof. Robin Barrow, Simon Fraser University raised his concern about empirical researches, concluding that an imaginative understanding of one's role is more important then a set of 'proven' methods and ethos. Thus philosophical inquiry into the nature of the enterprise is essential in teacher preparation.

Venu Narayan, Azim Premji University and Rajesh Kasturi Rangan, National Institute of advanced studies emphasized that for an integrative conception of wellbeing, we need to intertwine the social, biological and cognitive factors in a manner that does justice to all three. They used the notion of embodied cognition as a crucial bridge between the many levels at which conception of well being operates.

A broad based notion of wellbeing must inform educational theory. The paper suggested Buddhist ideas and Indian philosophy of mind and their normative implications to offer an alternative route to undersanding and inquiry that is significant for education.

In between these enlightening and informative sessions about the philosophy of education through exchange of ideas and questions, several view but significant questions about the nature, present status and possible routes of philosophy of education emerged.

The seminar ended with the declaration by Prof. Rohit Dhankar about an annual forum on philosophy of education to be organized every year.

Janaki Rajan

A report of the

E-9 Conference on Inclusive, Relevant Quality Education for All Teacher Education

Abstract

The Ninth E-9 Ministerial Conference 'Inclusive and Quality Education for All' was held in New Delhi between 8-12 November 2012 and provided rich insights into strategies with which the countries were moving towards relevant and quality education for all.

Background

The challenge of achieving education for all is particularly daunting in the following large developing countries - Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria and Pakistan, which represent half of the world's population, and most of the adult illiterates. The E-9 initiative was launched at the EFA Summit in December 1993 in New Delhi-India and since then Ministers of Education of these countries have been meeting to review achievements in basic education and define possible joint programmes. The education of girls and women, teacher training and literacy are on top of the agenda and these are strategically considered the most important for enhancing developmental perspectives. While each of the countries faces specific complexities, they also share common colonial histories and challenges in strengthening and deepening independent nation-building offering much scope for sharing of experiences.

The U.N. representative Irena Bokova pointed out that E9 have been co-operating since 1993, but world has changed since 1993. Rising economies also have large peoples in poverty. Quality is the best way to move forward towards social justice. Everywhere, children and parents are demanding education, education is always the first concern. 61 million children are out of primary schools, 71 million are not in secondary school. Among those in schools, many are not learning. Inequality is deep. Poorly qualified teachers, sub standard education are widespread. This is gambling with our children's future. We will not be able to meet the 2015 goals.

Skills hold the key to the future. Strengthen public policies for quality, and these efforts must be maintained. Stronger assessments are needed. There is need for GEQD framework to diagnose critical elements that prevents provision of quality education. We need national level assessments, but also assessment for comparison across countries.

The Minister of Education of the host country, Dr. Shashi Tharoor, pointed out that we are here to deliberate on Inclusive, Quality Education for 2/3 illiterate adults and over half of the world's children. The critical factors that impede reaching EFA goals are bi-litateral and multi-lateral understanding among E9. E9 has a seat in the EFA High Level Group and can be greatly influential. The systemic nature of the quality requires Frameworks. He quoted Mistral: The worst sin is abandoning the child. She cannot wait for tomorrow. Her name is today.

Stock taking of Progress

The progress since the 8th E-9 meeting held in Abuja, Nigeria was presented by Prof. Ruqayyatu Ahmed Rufai, Hon'ble Minister of Education, Nigeria. During the period 2010-2012, in the E-9 countries, the number of illiterates reduced from 537 million to 525 million illiterates in 2010. The Abuja Framework of Action in 2010 had a collective commitment to effective new resources for literacy. The progress has been considerable. New laws have been enacted, implemented, and national education policies evolved. Pakistan's goal was 80% literacy by 2010. India passed the Right to Education Act. Bangladesh goal was 100% literacy by 2014. In India, Egypt, Brazil

and Nigeria there was strong advocacy for education. Mass mobilization took place in Pakistan, for literacy in India, advocacy among Parliamentarians in Pakistan, Nigerian TV and Egyptian villages. India launched Saakshar Bharat Mission with the goal of 80% literacy. Brazil launched the Literate Brazil program (6.5% by 2015) in Brazil. Pakistan has committed to make 2 million people literate in 3 years and to reduce drop out to below 5%. Equity is the focus - India with programs for literacy for women and girls; Nigeria with focus on 22 minority languages, literacy across the life span, literacy linked to income generation and capacity building of personnel. There has been more community involvement and decentralization. Pakistan has devolution of management, through the National Commission for Human Development, Nigeria has management committees under National Mass Education Commission. NGOs, CBOs, have been active in India and Bangladesh. There has been steps taken for assessments and equivalence. India with its National Institute of Open Schooling and literacy for 2 million people; Nigeria with its equivalency frameworks which enable adult learners to join public schools after literacy process. India's private sector involvement in education is 1.2 Billion USD. There is increased private sector and community donations in Pakistan and Business Forum in Egypt. The E9 is a useful E9 platform. There have been workshops in India, Nigeria, Indonesia, collaboration with each other. At the International Centre for Policy for Education, 35 countries have signed up and made their POA, the Paris Communique on Global Partnership for Education.

Delegates highlighted their country's progress in education.

Bangladesh - The second chance
With a literacy rate of 59.8%, Bangladesh views non-formal education for adult and youth as contributors in economic development. Way back in 1972, the Constitution recognized education as fundamental right. 51% of girls are in schools. Whereas in the 1970s, literacy was 50% it is now 93%. The Net Enrolment Ratio in Primary education has increased up to 99.47%. In 1998,

the prestigious "UNESCO **Literacy Award** 1998" was accorded to **Bangladesh.** There is strong focus on livelihood based education for urban children of the 10-13 age group and livelihood training for the 14 plus age group. There are around 700 NGOs involved in literacy program in Bangladesh. BRAC, the non-formal primary school program reaches a million children. Around 10 million children have graduated from this program. 40,000 teachers have been trained. This is a 'Second Chance' program for primary education for those children who had dropped out of school or grown too old for school.

Inclusiveness is a constantly evolving process to make education more welcoming to all children irrespective of their backgrounds. The arrangement is to provide 1 room, 1 teacher, for 4 years. Most of the teachers are women. The Second Chance program is started only when 2/3rd of students are adults. There are separate schools for ethnic minorities; if students come from two tribes, there will be two teachers, one from each tribe. Every school must have at least one child with special needs. Lot of arrangements are made in the classroom to include this child such as special calendar, table, charts. Classroom formations are either 'U' or 'O' shaped. The classroom is decorated by student artwork. National curriculum is followed; but with supplementary books both for general and specialized.

Learning achievement assessments are least researched area in Bangladesh but what research existed shows that urban children did better than rural; boys did better than girls; and children of the mainstream sections of society did better than ethnic groups. One of the major reasons for this is that all children have to use mainstream language as medium of instruction and so there was no level playing field. Bangladesh is committed to achieve the EFA goal of 100% literacy by 2014, but faces some challenges. Need for materials to be prepared based on culture poses a challenge. Education does not have linkages with other programs. While the Non-Formal approach has been highly successful, there is absence of large long-term formal educational programs. Teachers engaged in Non-Formal sector have no career path. Natural calamities adversely affects educational efforts.

Brazil

According to the 2010 census, 9.6% of the population of Brazil are illiterate. 96.9% of children of the 7-14 age group are in school. Brazil has a Basic Education Development Index, which has contributed greatly towards improving quality. There is Priority Assistance for the children. Education initiatives are linked with poverty alleviation programs, sanitation programs, etc. Attendance of their children in schools is linked with monthly allowance provided to poverty groups. This improves regular participation in schools. Brazil is engaged in creation of public services for the poor people in collaboration with non-government and private sectors. Brazil has achieved the following advances in the last two decades:

- Access to primary and lower secondary education has become almost universal. 94.4% of the population in the ages 7 to 14 is now included primary and lower secondary education.
- The proportion of young people attending secondary education at the right age has doubled compared to that of 1995, showing a significant advance in the access to secondary education.
- The rate of youth and adult illiteracy has been reduced.
- Access to higher education has increased.

Literacy for all the children by 2013 is the commitment of the government. The biggest challenge is wide income disparity.
Brazil lays great importance to South-South Cooperation and E-9 forums.

China

China is well on its way to achieving EFA goals by 2015. China has already achieved near universal enrollment in primary and secondary stages. This marks a 20% increase from 1990. In 2010, a National Plan for Equity and Compulsory Education was announced. Public education budget is now 4% of GDP. There are National Standards for Schools and every school has to acquire the standards.

For education for disadvantage groups, there is a financial support of 40USD as scholarship.

Teachers are provided special education training to enhance their abilities to reach out to the disadvantaged. With increased urbanization, there is focus on education of migrant groups and teachers training in rural areas. 6 National universities have been offering scholarships for teachers who work in rural areas. China lays great emphasis on ICT in education and the sharing of theory and practice. High speed internet connection is provided to all schools. Education is one of the highlights of the commitment of the National Congress and very high on national priority. Support for education from all walks of life and society is strongly encouraged. Currently, the focus is on monitoring and assessment of education. After achieving EFA goals by 2015, technical education and vocational education to support economic development will be on the agenda post 2015.

Egypt

There has been a paradigm shift in education due to the recent political changes in the country. Egypt is committed to reforms in education. Literacy centres have been established through partnerships with private and other actors and collaboration with World Food Program (WFP). Egypt won the UNESCO Literacy award in 2010. The Strategic Plan for 2007-2011 emphasized access to equal education, support systems and community participation in education. There exists an enrollment gap of 1.2 between boys and girls in KG. However, children belonging to disadvantaged and difficult circumstances are accessing education in the 45, 773 schools. Learning, Life skills and accepting of others are the focus areas in education. Girl friendly schools are being established through support of NGOs in remote areas. Active learning strategies and cooperative learning is being adopted. Quality and organizational capacity building initiatives have been progressing with five workshops for the literacy teachers.

Future Challenges include need for more schools, and funding. To improve quality in education, student involvement, curriculum reform and decentralization are being tried out along with professional development of teachers, ICT. Curricular content is being aligned with market need and employability. The needs of groups who are victims of multiple discrimination has to be addressed.

India

On universal primary education, India has ensured availability of schools in a 1 km radius. There is near full participation in enrollment and there are lesser number of children out of school. However, 30% children fail to complete primary school cycle. There is a huge establishment of pre-school centres through the Integrated Child Development Scheme by the government for non-formal education. There is still a struggle to improve quality in the non formal centres.

Literacy - India is on track to achieve this goal by 2015. Gender parity is quite reasonable at primary level but parity is not as good at higher level. The Right to Education Act opened up a new area for children and education. Adoption of right based framework need to be taken to ensure entitlement for every child. The Right to Education cannot be implemented only by government. To ensure equity and quality private schools have been included. 25% of admissions in private schools must be from economically weaker sections. Inclusion has to start from classrooms, classrooms need to be child friendly.

It's not an easy task to take education forward in a country like India. Challenges are huge. The thrust is that no child should drop out from elementary education cycle. Back to School campaigns have been states in many states to re-enroll children who have dropped out. Retention of girls is also a focus and residential schools have been established. The role of Civil Societies are important in achieving these goals. Malnourishment of children also contribute in dropping out. There is a universal program of Mid Day Meals as a basic right. Availability of quality teachers is an issue, there is a back log of one million of teachers in remote areas of the country. Quality is a major challenges inrecruiting teachers in such large numbers. Modern technologies are being used for teachers training and on-site support as well as training through distance education. School monitoring and school improvement programs are being undertaken. Textbooks and curriculum reviews are also being done.

For out of school adolescents, literacy mission provides life skills and certification programs. There is also vocational education framework also for youth and adolescent groups. India is on the right track, probably on a fast track. Financial requirements are not a big challenge. Technology is also a big help to achieve the goal.

NCF 2005

There are two parts to the development of NCF 2005. India is a federal country and any document of the nation has the formidable task for getting consensus. NPE 1986 saw the NCF as the means of building national consensus and the curriculum load. 1990s was a decade that was characterised by fragmentation of the discourse.

At the apex, is the Steering Committee with scholars, teachers, NGO, teachers. Then there were 21 Focus groups: curricular areas, national concerns, etc. ensuring that this was not just a document to be prepared.

The document consists of perspectives, objectives and also the conditions, necessary for curricular change through a participatory nature of curriculum making. Learning in the classroom must reflect what the child experiences outside the classrooms. The two are divided in a colonial country like India. Opening chapter touches on what is globalization; chapter 2 is about learning and knowledge and it is not conext that we stereotypes the child from one type of response from a child. A single axis of success is presented. This document stresses on diversification, flexibility in children's learning styles. Psychology, specially constructivism approach which has more spaces for learning. A space where the children of the marginalized move away from one notion of success, and those who do not meet it, are considered failed. This document spells out a more cognitive and sociological idea of children's learning, and re-conceptualisation of the areas. Chapter 3 talks of curricular areas and what are the defining features, and also see what curricular areas have come to mean-they have become devoid of vibrancy, language is taught in such a way that children are unable to articulate their thoughts

or debate. It creates an ethos that does not push children to memorise and that enables the teacher not to feel forced to 'cover' the syllabus. Last chapter, explains 'quality' as a self awareness of the need to improve. Also, there are multiplicity of governance structures. Vocation and academic are brought close together. The NCF was finalized based on consensus. Then text books, a new kind of textbook was created. Textbooks to be used to inspire. What we need is to provide a 'taste' for learning. The child can learn on his/her own steam after that. China was inspired by the NCF as it takes into consideration the diversity. China has made some reforms in curriculum, 8 reforms have been conducted.

Krishna Kumar said that this is a persuasive document, it is not imposed by the central government. But it was approved by the states. RTE also specifies that NCF will be the academic order. Because it is a persuasive document, it shows the better ways to go about things, but does not prescribe. How can there be more humane evaluation, assessing in a more holistic way. Use this document as a goal setting document which is above politics. 15 states have decided to use these textbooks.

Indonesia

Indonesia has strong commitment for EFA and has taken many steps to ensure medium and long term planning towards this. Curriculum, Teachers training and national assessment are the initiatives. Several changes have been made to get the competency based curriculum after 2006. Learner's characters and combination of soft and hard skills are the focus. 2.9 million teachers are there. One million teachers are certified by 2011.

Milestones for teachers reform

20% of National budget is allocated to Education now. School Accreditation system for formal and non formal education system are in place. Construction of schools, classrooms, new library has been initatied. Unemployment is a major concern so we have national framework of education for employment. Ethics, morale, scope of knowledge have been described. Competency based curriculum and trainees for vocational education/training are there. To ensure learning out come, national system of examination have been established. New system for improving

quality consists of 40% share from classroom assessment and 60% from national assessment.

Nigeria

In Nigeria, progress has been made. 74% urban and 64% rural children attend primary schools in Nigeria. 100% access is the target along with equity and gender parity. To ensure quality in education, criteria has been laid down for teachers. Teachers need to improve their methodologies. Drop outs are low in 2010 when compared with the data of 2004. Nigeria has more male teachers than female teachers. There are a large number of untrained/unqualified teachers but Southern states have good quality teachers. Basic science and technology has been introduced at basic education level. Social study is compulsory at basic education level.

Low quality at entrance is a challenge for teacher's education. Low motivation is also a challenge. Teacher's trainees have negative attitude towards teaching profession resulting in poor learning environment. There is paucity of laboratories in schools. Teacher: Pupil Ratio varies from 1-30 to 1-70.

Nigeria was short of 660,000 classrooms but now the deficit has come down to 330,000 classrooms. Private sector support is poor. In areas with difficult terrain, schools are far away from home and this results in less student participation. Data gathering system is also poor. Projects have been initiated for out of school children. Girls education projects: equipments are being provided to school and support to teachers. Provision of text books in English, Science have been made. Advocacy and sensitization is being done with parents and community on education. Quality assurance, ICT are in place for teacher education. Curriculum for teacher education and review have been done. ECCE is compulsory in all public schools of the country for one year of pre-school. Annual teachers awards are being introduced to recognize teacher' work. Provisions for library, textbooks is being enhanced. Multi sectoral efforts, EMIS contribute to girls education initiatives. Infrastructural facilities are still inadequate. Northern part has less participation

of girls in comparison to southern part of the country. Nigeria spends 2% GDP on education in addition to local matching grant.

Nigeria recognizes that more funds will be required for education. While education is on the Concurrent List, the role of central government is limited. Quality education can only be achieved through political will. Even if EFA goals are not achieved by 2015, 80% of teachers will be qualified by that time. Sensitizing parents, advocacy for the teaching profession and making it attractive are key strategies being pursued for quality education for all.

Pakistan

Natural calamity and conflicts created challenges to achieve the goals. Terrorisim, lack of proper infrastructure and teachers made it more difficult to progress. There is lack of political will, lack of community participation and the political context further creates challenges in Pakistan. Pakistan is facing war against terrorism, (Afghanistan) and resources are being utilized for that. National education Policy 2009, National commission for Human Development are two key steps in education.

Free education and text books up to secondary level have been ensured by the government. Pakistan has also tried to improve quality through reform in teachers training, examination system and promotion of need based literacy, functional literacy , child friendly schools have given a boost to the goal in the county.

Under the 18th amendment , Article 25 A of the constitution of Pakistan- 'State shall be responsible to compulsory education for all the children of 5 to 14 years age group'.

Lessons learnt in Basic Education

- ECCE of 3 years or 2 years emerged as key strategy for quality basic education (China, Indonesial).
- Initiatives that had a cycle of 10 years to 20 years have yielded measurable gains in quality improvement in basic education.

- E9 Countries most effective in their quality basic education had 9 years of basic education and 2-3 years of prior ECCE (China, Indonesia).
- Teachers need to be at the centre stage of planning and leadership of EFA. They need to be seen as a key constituency in and of themselves.
- Education needs to be viewed along with related social development specially poverty alleviation.
- What do we mean by quality education- why education and what for education needs debate.
- E9 experience is that education is the best contraception (India decadal birth rate fell after DPEP/SSA- before 1990s population growth was 24% per decade, now it is 17% and 11% in the south of India).
- While two E9 nations have reached a point where 9 years of basic education has reached 99.95% of children (China) and 99% (India), the gap of unreached in terms of absolute numbers remain huge.
- Nigeria has been able to exponentially increase its higher education institutions.
- Schooling has been linked with poverty alleviation programs (Brazil) and gender equality (Ladli Scheme, India).
- China and India have clear goals for substantial presence of young people with higher education in the work force.
- China has clear strategies, after UEE, for 'balanced' approach i.e. correcting imbalances in rural schooling by ensuring ICT in rural schools and massive investment in infrastructure development of rural schools. Urban schools have been drawn in to twin with rural/urban poor schools (China, Delhi). University students have been drawn in to work in rural areas for 3 years and this is paid for by the central government (30,000 students, China). 6 National 'Normal' Schools provide special curriculum for teacher education for rural schools. No tuition fees, additional benefits.
- Education index has been developed and is in use (Indonesia).

☐ Even countries at risk of natural calamities, war, have greatly expanded ECCE with a strong Quality Framework (Pakistan).

☐ Gender as barrier to education not an issue in some E9 countries (China, Brazil) but a huge issue in others (India, Pakistan, Nigeria).

Quality concerns

☐ Equity concerns strongly inform most country effective strategies for quality improvement.

☐ How can we persuade governments that not only is our concern that of education, but also of development. How can we draw other ministries into EFA agenda?

☐ How can we, E9 countries help each other and carry them along for 2015 and beyond

☐ Generic and concrete replicable experiences have to be shared (Olav).

  o Share China's experience of piloting central schemes in different socio-economic settings, learning from these before roll out.

  o Share children's stories, textbook materials so that they may be included in each others' teaching-learning materials.

  o Action plan of 2013 for most E9 countries already in place-let us find spaces where E9 can observe, participate in each of E9.

☐ Language: Learn from China, the only one of the E9 countries which presented in their language, while all other E9 struggled to present themselves in English.

☐ Which country will lead which initiative to be decided by their comparative edge.

Strategies

☐ Bridging the Rural-urban divide, reaching unreached areas drives most strategies.

☐ E9 problems and issues have great commonalities and there is huge potential to collaborate and strategize collectively.

☐ South-south geo cultural commonalities is a plus, a resource and not a liability.

☐ Need research to assess on our achievements, and experiences we can learn from best practices. And failures. Spectacular failure is the best of teachers!

☐ All children are unique and special; otherwise we categorize and separate, tend to exclude - but certain exclusions happen because people belong to a certain group. What are the implications for planning and implementing strategies for special groups. Some disabilities are physically and visibly disabilities, the question is also one of what is not visible: It is a matter of human and financial resources. There is value for a country saying 'do this, or it will break the camel's back'. This principle is transferable [to all excluded groups at different points in time]. Otherwise, powerful voices can influence, and decisions can be taken for political reasons than for technical or research based reasons.

☐ Platforms of local governments and judiciary to be systematically involved to generate political will and judicial support.

☐ Post 2015, we need to hasten slowly, and move with deliberate speed-rather than have global agenda that countries feel they need to force fit.

Sarwat Ali

National Seminar on Art Integrated Learning:
A Commentary

Abstract
This article attempts to explore the salient features of Art integrated learning as an innovative pedagogy developed by the Department of Arts and Aesthetics, NCERT in MCD schools of Delhi. Examples on learning language and mathematics to break rote memorization are highlighted along with a word of caution that it should be guided by Constitutional provisions, and social justice.

The Department of Arts and Aesthetics, NCERT organized a National Seminar on Art Integrated Learning (AIL) for primary level of school education on 17th and 18th December 2012 in New Delhi. The seminar was organized, so as to provide opportunities to school teachers, teacher educators and children to share their experiences of AIL with Heads of DIETs and SCERTs. Educational Authorities of MCD, NDMC and Directorate of Education were special invitees. The initiative was based on recommendations of the NCF 2005 to make Arts Education a compulsory component of school education.

Background
The focus, as specified by the concept note on the seminar was to use Art Education as innovative pedagogy for holistic learning and development of children in school at primary level, not merely making arts a compulsory component.

The concept note highlighted the various components of the initiative as follows:
- Focus group discussions with teachers and principals of the school.
- Preparations of the material on the basis of FAQ's from teachers and stakeholders.
- Preparing teacher training modules, seven of them for understanding of AIL as a concept.
- Ten day training program of selected teachers from 20 schools based on the training package.
- Organizing various activities of art experiences in the classroom and integrating them with curricular subjects.

- Launch of AIL in 20 MCD schools in collaboration with DIET, Rajender Nagar
- Hand holding meetings with AIL teachers once a month
- School visits for a follow up

A pilot study was conducted by NCERT with 20 schools of Municipal Corporation Schools of Delhi. The presentations of the activities in the school and the findings of the impact of the study were shared during the seminar.

The proceedings
During the seminar, school teachers of MCD were given an opportunity to share their experiences of the initiative. Almost all of them made power point presentations; some showed video films. The teachers appeared confident, motivated and well versed with pedagogical techniques and issues; much more than the teachers in school usually seem to know. Bringing school teachers on a forum and giving them opportunity to be on the other side where they are not just listeners is a welcome step. The children in schools who participated in these activities seemed involved and appeared to enjoy the art activities and art integrated activities as was evident through videos and still pictures. The transition from merely copying from the black board to writing poems and answers on their own is certainly a great way to help children to learn language.

A good example of the NCF 2005 recommendation was presented by a participant who was independently trying out AIL for classes 3, 4, and 5 at MCD Primary school, Sahyog Vihar in Delhi.

She described that to address grammar in context, children were asked to draw anything they liked. Children drew cycle, ice cream, butterfly, bird, jalebi, pencil etc. One picture at a time was selected at random. One picture was that of jalebi. The picture of jalebi was pasted on a flannel board. The children were asked what the picture looked like. One child said, it looked juicy, another said it was yellow, a third said 'round', yet another said circular. All these words were written on the black board - as many as 17 different responses. The teacher pointed out that all these words describe the special qualities of jalebi. And such words were called adjectives.

Relating numbers with art was less effective, and displayed limited conceptual understanding of how children learn. For instance, making the numbers with clay may be good for motor development and for recognition of numbers, but does not seem appropriate for understanding number concepts. Drawing and painting fractions is one step forward by seeing the concept visually for learning fractions but insufficient to grasp the concept. These are just few examples, scrutiny of the activities by pedagogical professionals who are subject experts as well would perhaps better inform conceptual misconceptions. Therefore, it not only seems essential but inevitable to get these activities authenticated before they are further made use of in other schools of the country as it is being planned; executing extensive try out besides professional advice also seems essential.

Some areas of concern

Despite the impressive work presented, it appears that for Art Integrated Learning, art needs to be seen as a means and not an end to the means. Enlisted below are few examples which seemed problematic in the plays staged by children of 12-14 age groups at the end of the first day.

☐ One play depicted the poor and the rich. The depiction was based solely on depictions on materialistic possessions that the rich have and poor do not. This single-dimensional way of depiction lacked nuance and complexities that define poverty and wealth which children of the 12-14 age groups can well grasp and often do. Despite the creativity of children, the play served to legitimize of poverty through AIL.

☐ Another play establishing that Mughals did not bring this land with them and this land belongs to the community. So far so good. But the 'community' was portrayed as one which only has Sadhus as priests. What was the message and how would it be understood by young minds in a multi-cultural society?

☐ Yet another play brought forth the idea of women having the right to come back home late night just as men do, as a straight forward linear analogy. The roots of gender inequality, the social realities that are manifested and its various forms were not explored. The next morning, the news paper informed us of the ghastly gang rape of young women at 9 p.m. in a bus.

☐ Religion was visible in presentations made by the teachers of MCD, while sharing their experiences of the AIL project. This included making idol of Ganesh, reading Namaz, preparing and celebrating Chat Puja etc. These pictures were not related to curricular area nor were they followed by any discussion.

Seen in the background of inclusive education which the Right to Education Act assures all children, inclusive education "is a point of view that cuts across all subject areas, and addresses the histories and experiences of people who have been left out of the curriculum. Its purpose is to deal equitably with all gender, caste, class, ethnicity, differences in the human community; why things are the way they are in terms of power relations and equity issues, by equipping students, parents, teachers the tools needed to combat discrimination and to find ways to build a society that includes all people on an equal footing.''

"Education is not just about having children from different backgrounds in the classroom. Bodies of children are not enough. And dances and dresses and dinners portraying various communities are not enough. Dominant culture is as different as all cultures. But it doesn't get named as different, it gets named as normal. Anti-discriminatory or inclusive education helps to move this perspective over to the side to make room for all cultural perspectives.''

What we need to ask ourselves

''What kind of pictures are up on the wall of the classroom? What kind of festivals gets celebrated? What are rules and expectations, kinds of language that is considered acceptable? What kind of interactions is encouraged? How are children grouped? Teachers will need to acknowledge that their own education has had a cultural bias, that is exclusionary and this needs to be purged. They need to look at how dominant cultures and biases affect their view of non-dominant groups in society. They need to look at their own culture, see what their idea of normal is, and realize it is quite limited and is just reflecting a particular experience. They have to see that what they often view as universal is actually exclusionary. To be really universal, they have begun to learn what the marginalized silenced groups have to say about themselves. Educators will be dishonest if they do not point out that some people benefit from marginalizing certain groups. We have to talk about how young people, teacher and students can use that to change the order of things so that more people benefit" Wayne Au (2009). Even though inclusive education was dealt with in one of the presentations, it was not from the perspective of social justice.

It was argued that AIL is the teacher's choice, so what is wrong with it? It is only art, as one participant tried to point out. It may also be argued that suppression would not help and this is an honest expression of how people feel. I am not sure if we have complete freedom of expression at cost of making certain communities invisible. The notion in the play that land belongs to all and we all have to make it better would have been a more real expression of a peaceful society.

The National Curriculum Framework for Teacher Education (NCFTE) 2009 details out secularism in education in unit 9 as follows:

"The essence of secularism rests on two basic principles:
☐ Separation of religion from politics.
☐ Acceptance of religion as purely and strictly private affairs of individuals having nothing to do with the state.''

It further reiterates "In India, secular tradition is deep rooted in its history. Indian culture is a composite one which is based on the blending of various spiritual traditions and social movements".

India has enormous diversity and our Constitution pledges equal opportunities. We need to make sure that all cultures find expression in the class room, not just familiarizing with cultures of some dominant groups alone. Uncritical enthusiasm may be counterproductive. Innovative pedagogies need to ensure that they are guided by social justice and constitutional provisions.

Celebrations are important, but what celebrations we choose has immense significance. Why birthday celebrations? A birthday celebration is a middle class and elite and colonial culture. How relevant is it to bring it in school education, especially with MCD school children, where some of them find it difficult even to avail basic amenities. The teacher's need intense training to include culture specific pedagogies, to understand the sensitivities and pedagogical techniques before integration of culture in education is considered.

The AIL initiative included a pre- and post test on curricular achievement after AIL. The findings of the study informed that no significant difference was found in achievement among the children who learnt through AIL and through conventional chalk talk.

Conclusion

On the second day of the seminar, Prof. Krishna Kumar former Director, NCERT, expressed his discomfort at considering art as subservient to other curricular subjects. He reiterated that art in itself is essential for peace and non violent society and recommended Devi Prasad's, Art, The Basis of Education, as one of the essential readings in this context. He also emphasized how important it is to develop aesthetic sensibilities. Aesthetic beauty, he felt was essential for creating beautiful minds.

It would be pertinent to include a debate on the forum 'Kitab Copy' which noted that in recent

times, a few private schools have started celebrating Annual Days and other functions from 2/3 PM in the afternoon to 9/10 PM as if it is a wedding ceremony. During this period, students from 5 year old to 18 year olds participate in various cultural programs and voluntary tasks. Recently, a Ranchi school kept the children in December without warm clothes for these seven hours as the children were required to perform in summer costumes. The dignitaries present were the Director and Inspector Generals of Police and School Management members from Delhi. The children were made to prepare for the cultural programs for a month or so, leaving the class rooms during regular class hours. Clearly, Art Integrated Learning is an initiative worth taking forward more thoughtfully and certainly not in haste.

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Book Review

James Tooley, The Beautiful Tree: A Personal Journey into How the World's Poorest People Are Educating Themselves. 302 pages (hardback). Penguin Viking. 2009.

The first six chapters of the book, A beautiful tree, present the picture of budget private schools in various countries - India, Nigeria, Ghana, China and Kenya. James Tooley in these chapters presents how in these countries private schools are serving the poor people's need for education for their children. Also during this journey, he has shown the various merits of private school like accountability to parents, commitment from teachers, cost efficiency, English medium etc. In the book he has tried to argue how these private schools show us a way to achieve the goal of universal education.

The story of each country starts with the government officials and development experts denying the presence of any budget private schools, which is then proven to be incorrect by Tooley's research team, which goes into streets of slums and villages and unearths these small enterprises. Another interesting observation that Tooley presents across the countries is the state of work at all levels of the government education system. The system works more or less in similar ways across the countries and is ripe with corruption, nonchalance, bureaucracy and blame games. The state officials across the countries believe that the poor people are sending their children to private schools out of their ignorance or peer pressure. To this he points out some very real problems of public schools:

1. Teacher absenteeism
2. Socially distant teachers
3. Poor/"horrific" conditions
4. Low standards/poor outcomes
5. Out of school children

And development experts unanimously agreed to this situation. But instead of giving up and looking elsewhere, the solution that the reports from several of these organizations suggest is more and better public education. Tooley uses these reports for shunning private schools and quotes the reasons cited in them - lack of teachers' training and poorly paid teachers, low quality buildings and motivation to make profit. But these are not the reasons why the reports still prefer public education – these have been presented later by Tooley. Tooley compares these schools with laptop manufactures being motivated by profit. Although, it is fair to question whether comparisons between providing education and manufacturing are valid.

The author's own research tested 24,000 children in India, Nigeria, Ghana and China, in Maths and language proficiency; in India and Africa, he found that in almost all respects, children in private schools performed better than those in Government schools. In other words, teachers may be unqualified, and school buildings may be dreadful, but private schools more than compensate, because they are directly accountable. Only in provision of playgrounds did the Government schools do better across the board.

Some development agencies have been contemplating role of private schools in universalization of elementary schools but they have also advocated strong government regulations. But Tooley says that the already existing regulations with regard to schools or other sectors are constantly flouted and are an immense source of bribery in all the countries. Tooley questions why the accountability has to lie with the state and why not to the parents which in case of private schools already exists. Private schools make changes to keep up with parent demands and thus are more responsive. In case of government services for poor, parents have no control as they are directed by the state and poor people do not have voices which can be heard by government. It is important to note at this point that the work of another researcher in this area has shown that parents are not entirely satisfied with the quality of education in low fee private

schools also, but they are sending there only because they do not see any other option. Srivastav writes, "While low-fee private schools were seen as a better option, they were not necessarily seen as a good option"

In one chapter the author has presented "five good reasons" why development experts have been rejecting private education and counters them:

1. With the rise of enrollment in private schools, government schools are left only with the most marginalized children and reduced parental pressure to improve and further privatization will worsen this problem. Tooley has not directly countered the point, rather argued that if the poor children get the education they desire for by private means, then why should it be relevant whether this undermines the state system.

2. The second reason is Tooley's interpretation of the UNDP report which he perhaps paraphrases as "market failure". Education is seen as a public good as investment in education not just benefits the person who gets it but also the society at large. He says that UNDP is concerned that poor people may not see the investment worthy in terms of the returns they would get. Thus, it is possible that large number of people will not invest in it and thus education cannot be left on the chance of private investment. This he counters by pointing out that poor people see the private benefits and thus are already investing in it.

3. The third reason is phrased as the "pro poor" idea, where the concern is that private education cannot be the possible route for universalization of education as it requires tuition fees to be paid. Not all parents can afford it and will thus get excluded. This Tooley has countered by the possibility of creating targeted vouchers.

4. The fourth reason is that education is a fundamental human right and thus governments should play an active role in it. Tooley presents two version of the International commitment towards this right. The millennium development goal commits governments to ensure that by 2015, children everywhere will be able to complete a full course of primary schooling. The second version is the Dakar framework for action, commonly known as Education For All (EFA) which commits governments and NGOs to ensure that by 2015 all children have access to and complete free and compulsory primary education of good quality.

Tooley sees a remarkable difference between the two and says that where the MDG does not rule out the role of private sector, EFA by including the clause of free education rules it out. From here the argument goes to the last one, where the most important thing is not free education but poverty not being a deterrent and thus targeted vouchers may be a solution.

5. The last reason was about historically educational expansion being achieved by government intervention and not through the market. To counter this Tooley, presents three points. First, he says that by the time government involvement happened "universal primary school provision was more or less achieved in 19th century England and America". Secondly, he raises doubts about the education for all states considering truancy and dropouts. Thirdly, he questions why the route taken or imagined to be taken by the west may be considered to be the only way forward. The first and the second points seem to be contradictory to each other.

The eleventh chapter traces the existence of self finance schools in India as late as 1820s and shows that the criticism that the British presented of this indigenous system at that time is very similar to what states and experts present now.

1. Low paid teachers.
2. Lack of building.
3. Low quality teaching methods.

He says that similar private schools/systems of education were prevalent in other countries till the time government entered. He also draws a correlation that the government introduced schools neither achieved the contextual aim of education nor reached the desired numbers at that time, nor is it capable of doing so now. So going back to private schools is in fact the culturally appropriate model for these countries.

Tooley reiterates his solution for taking all the children to school by

1. Targeted vouchers and
2. Loans to budget private schools.

He believes that since these are profit making ventures small loans can be given and will be paid back. Tooley says that the biggest criticism of private schools is regarding the infrastructure which can be supported in this manner. As soon as the proprietors have money at their disposal, they invest it in the schools. The other concern about quality of education and pedagogy in specific has only obliquely been answered by two arguments that even in public schools education is mainly reduced to rote learning and since proprietors are keen on betterment they are also keen on knowing what will help them improve learning in their schools.

Tooley in this book has not touched the matter of the kind of textbooks being used in these schools and the question of teacher preparation. These are two major critiques of the private schools impacting quality of education. He also does not answer the question how vouchers will help working children get to school.

At one or two places, Tooley has pointed out that the salaries being given to the teachers are extremely low, but he justifies it be saying that it's what they will get anywhere else.

How Tooley views education and schooling is also questionable? Are they comparable? Education in a very vague sense also implies holistic development of the students not just knowing some facts. So if the private schools are able to achieve the task of getting students to pass the grades by knowing some facts with no understanding or critical and mental faculties or respect for constitutional values, then can it be called education?

It seems that Tooley comes from the understanding that education is only meant to be fulfilling the needs of the job market and has nothing to do with the kind of society a nation wants to build. As Srivastav points that the choice of private schools are only a choice of desperation. This is not a quality statement for the private schools and the goal of universalisation is not just to school children but to provide quality education.

The book is definitely written as a personal journey (as the name also says) and sometimes describes in detail the experiences and emotions of the author more than the topic being discussed. As a result many of the arguments that he has made are familiar and commonsensical. This book is written in a very easy to read language and full of anecdotal references which make for a novel like reading. It is for the reader to decide whether she agrees with Tooley or not.

The reader can also read another book with the same title: The beautiful tree - indigenous Indian education in the 18th century. It is available on the website www.arvindguptatoys.com

Bibliography

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Chudgar, Amita. (March, 2012), Economic and Political weekly, Variation in private school performance.
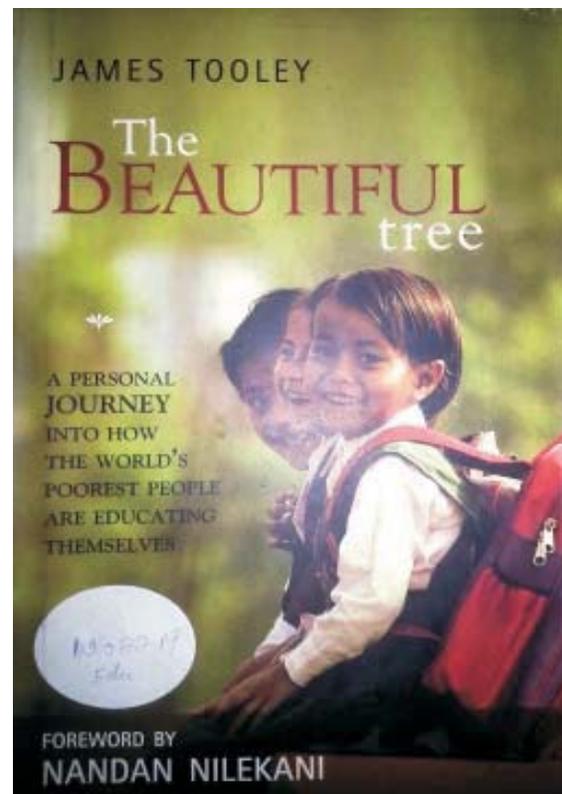
Conference Announcements

3rd International English Language Teacher Educator Conference, Hyderabad
The British Council, EFL – U (English and Foreign Languages University), ELTAI (the English Language Teachers' Association of India) and IATEFL (the International Association for Teachers of English as a Foreign Language) have come together again to host the 3rd International English Language Teacher Educator Conference. This conference will be held in Hyderabad from 16 – 18 March 2013 at the Hyderabad International Convention Centre.

For more details visit the **www.britishcouncil.org.in website.**

13th International Pragmatics Conference (New Delhi, 8-13 September 2013)
The 13th International Pragmatics Conference will be held from 8 to 13 September 2013 at the India Habitat Centre, New Delhi, India. The conference is hosted by the Indian Institute of Technology (IIT). The theme is: *Narrative pragmatics: Culture, cognition, context.* The conference is open to ALL OTHER PRAGMATICS-RELATED TOPICS as well (where pragmatics is conceived broadly as a cognitive, social, and cultural perspective on language and communication). The conference is chaired by *Rukmini Bhaya Nair* (Indian Institute of Technology).

For more details visit: **http://ipra.ua.ac.be/main.aspx?c=.CONFERENCE13**

Making education inclusive - By identifying and dismantling exclusionary pressures and practices in education.
The Southern African Association for Learning and Educational Differences (SAALED) in association with the UNESCO Chair in Teacher Education for Diversity and Development at the Wits School of Education announces its biannual conference to be held in Johannesburg from 1 – 6 July 2013.
1 – 3 July will have a research focus, and students, academics and researchers are invited to submit abstracts of current and completed research for consideration for inclusion in the programme.
4 – 6 July will include various plenary and workshop sessions presented by invited local and international speakers to equip teachers and therapists to meet diverse learning needs.

For more information visit: **http://www.inclusionconference2013.org/**

Visit **https://www.coursera.org/#universities** for information on free on-line courses conducted through collaboration of 33 Universities offering 215 Courses including in Sociology, Psychology, Micro Economics, Media Studies, Language processing, Management, Computer Sciences, Artificial Intelligence, Engineering, Global Warming and many more condcuted by MOOc, Massive Open Online Course.

Abbreviations

AIL	:	Art Integrated Learning
B.Ed.	:	Bachelor of Education
B.El.Ed.	:	Bachelor of Elementary Education
BRC	:	Block Resource Centre
CPD	:	Continuous Professional Development
CRC	:	Cluster Resource Centre
CTE	:	College of Teacher Education
D.Ed.	:	Diploma in Education
DEO	:	District Education Officer
DIET	:	District Institute of Education and Training
DPEP	:	District Primary Education Program
DU	:	Delhi University
ECCE	:	Early Childhood Care and Education
EFA	:	Education for All
ELTI	:	English Language Teaching Institute
EVS	:	Environmental Studies
GDP	:	Gross Domestic Product
IASE	:	Institute of Advanced Studies in Education
ICDS	:	Integrated Child Development Services
ICT	:	Information Communication Technology
ITP	:	Initial Teacher Preparation
M.Ed.	:	Master of Education
MCD	:	Municipal Corporation of Delhi
MDG	:	Millennium Development Goals
MHRD	:	Ministry of Human Resource Development
NCERT	:	National Council for Educational Research and Training
NCF	:	National Curriculum Framework
NCFTE	:	National Curriculum Framework for Teacher Education
NDMC	:	New Delhi Municipal Corporation
NGO	:	Non Government Organization
NPDE	:	National Professional Diploma in Education
NUEPA	:	National University of Educational Planning and Administration
ODL	:	Open and Distance Learning
OoS	:	Out-of-School
PDS	:	Public Distribution System
Ph.D.	:	Doctor of Philosophy
PISA	:	Program for International Student Assessment
PTC	:	Primary Teaching Certificate
PTR	:	Pupil-Teacher Ratio
RBC	:	Residential Bridge Course
RMSA	:	Rashtriya Madhyamik Shiksha Abiyan
RtE	:	Right to Education
SC	:	Scheduled Caste
SCERT	:	State Council of Educational Research and Training
SMC	:	School Management Committee
SSA	:	Sarva Shiksha Abhiyan
ST	:	Scheduled Tribe
STC	:	School Teaching Certificate
TISS	:	Tata Institute of Social Sciences
UPE	:	Universalization of Primary Education

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