

Re-Engineering Education As If Students Mattered

India prides itself on its success in education. Largely driven by the perception of the Western media that has lauded the competence of Indian engineers and the sheer numbers of engineering graduates who fill the benches of Indian software and outsourcing companies, we are now, at the political and upper-class level, in a self-congratulatory mode. The success of Indian knowledge companies is now being seen as the success of Indian education.

While a part of this perception is indeed correct, a significant part of it is wrong. Self-applause brings with it complacency and comfort with the status quo. Never before has Indian education needed reform more than today. Never before has our education system been in greater danger of obsolescence. Never before have students, in the single-minded pursuit of marks and ranks, committed hara kiri in such large numbers because they saw their dreams evaporate with the results of one exam or foresaw harsh retribution from their families (2500 of them killed themselves in 2007).

The congratulation must be reserved, not for the educational system, but for the quality of individuals who are successful in their careers due to their innate ability to harness the system to meet their personal goals. This success is not because of the educational system in place; indeed it is despite it. It is a harsh meritocratic environment, driven by learning by rote, with little stress on experiential learning and excessive focus on textbooks, answer books, homework and evaluation, token appreciation on values and ethics, unnatural spotlight on narrowly defined achievement. Teachers are encouraged to focus on grading children and then comparing them, often openly - a process that creates disillusionment, unnecessary competition, rivalry and jealousy in formative years, when collaboration and group learning should both be seen as paramount virtues.

The proof of the failure of this education system, in a larger sense, is in the pudding itself: if you were to ask engineers, for instance, just how much of their education is relevant to the job that they do at work or to their lives or to their interactions with others, few would suggest a number above ten percent.

The focus of the Indian education system is on 'literacy' - a peculiarly defined term that includes the forced assimilation of information: formulae that will rarely be used after an examination, scientific facts and figures that need recitation in a test rather than understanding and the study of important subjects such as the social sciences (history, geography, economics, social responsibility) purely as an imposition. The education process is further sanitised by prescribing colourless, vapid textbooks that focus on the end result in an examination that is generally stressful to students because they compete amongst themselves, on one hand, and time, on the other.

Few words are as erroneous, when they are correlated, as literacy and education. A person who is literate is called 'educated', in the belief that they mean the same thing. Yet, the difference is vast and not just in degree, but in substance; it is the difference between night and day.

India's effort to become a literate country is a courageous attempt to balance the numbers with the quality of education, and thus far, the numbers are winning. Quality, regrettably, is a lost focus, particularly when a growing economy is able to absorb semi-literate, ill-educated people in a diversity of jobs that have little correlation to their skills or preferences. The focus by India's politicians over the last few years has been to convert literacy into a mass opportunity in two self-serving ways. They

1. Create allocations for literacy in institutions, thus opening up vote banks; and
2. Run educational institutions as smooth production systems that churn out mediocre, poorly trained graduates, engineers, doctors and MBAs, among others, who pay high fees for the benefit of a degree, which, in turn, is the passport to employment or further education.

Education is a far deeper idea, because it prepares an individual, not only for a career, but for life. Education is building one's emotional intelligence, as well as skills that will create sustained relationships with people, understanding the Earth and its different cultures in an increasingly inter-connected World, experiential learning in Science and Technology, the inculcation of interdisciplinary thought, appreciation of art and literature and, importantly, respecting our country's heritage and its many different cultures.

Education is not about competition, but about collaboration, which is a far greater skill to learn and more important to one's life. Critically, the education process must impart enduring knowledge that enables the individual to form an independent set of values. Therefore, the time has come to address the needs of true education that focuses less on **winning** the race and more on **living** the process; indeed, the race is then no longer a race, but a less stressful amble. Nothing exemplifies the current obsession with winning than the system of teaching the second language in Indian schools, something that I shall now dwell on, as an example.

The role of Hindi as the second language in the CBSE and ICSE curricula must be debated seriously. In the South, for instance, the standard of Hindi is a source of much concern, since it is rarely spoken in its pure form in any part of the region or used in written documents of the Government (colloquially, the Hindi spoken in urban India is hugely different, mixed with liberal doses of English, creating 'Hinglish' a quaint derivative). I do not argue the need for Hindi - every Indian must know the language and Hindi is very useful in the rest of the country. But here's my point: why should an unacceptably high standard, a

standard never used in colloquial or written etiquette, be taught (more practically, hammered in) to students, the process beginning when they are just six years old. It is common to see parents and children go through sustained stress in the process of learning, by senseless rote, a language that is presented in an asinine, unthinking structure. Children learn just enough to get through the examination and then shudder to recall anything they learnt.

The consequence of this stress? Across schools in India, more particularly South India, children now hate Hindi and see it as a horrible imposition designed to de-motivate them and test their endurance. This is not Hindi's fault; rather it is the fault of the designers of curricula who defeat the very purpose of multi-lingual education. At another level of analysis, it is the vacuity of ideas in creative teaching that drives efficiency, to meaningless effect. The time spent on such fruitless pursuit should instead be utilised to develop a child's instinctive affinity for words and language, the teachers being trained, not in the language itself, but in developing creative material to help students appreciate the same language; using theatre, images linked with words, stories and the film media to build practical skills in Hindi. Hindi need not, and should not, be a way of distinguishing 'brilliant' students from the others. But, the Indian-Macaulay system of education does this extraordinarily well.

This is a waste of human resource. The Japanese call this *muda*, which stands for "waste", "futility" or "purposelessness". The originator of the muda concept was Taiichi Ohno who developed the pioneering Toyota Production System. He created an intellectual and cultural framework for eliminating waste, which he defined as "any human activity which absorbs resources and creates no value." By this definition, over 80% of the content taught in our schools is *muda*, since it creates no **enduring** knowledge, exhausts a child rather than energises and precludes fun and significant experiential learning.

A great deal needs to be done; indeed nothing short of re-engineering of the educational system will help. Education should be driven by four critical parameters, now accepted world over:

- ✂ Education should focus on enduring knowledge (or "education for life").
- ✂ True education exerts minimal stress on the child or the family.
- ✂ Education must equip students with values, helping them deal with an increasingly complex, multi-cultural, diverse world.
- ✂ The *process* of education must be the focus, rather than the end result - this means that education must be fun.

In addition, I will add one parameter that is missing in the existing system: rural education must be relevant to future livelihoods.

Education for life

Enduring knowledge is different from information. History as presented in textbooks is information; the lessons from history and the evolution of humans are knowledge. It is silly to have millions of children learn about the date of the Battle of Panipat, for instance; this is *muda*, since it is a waste of memory and adds no value. On the contrary, it induces stress in children since it needs effort that is boring and repetitive. Instead, students need to learn just how the *sequence of wars* altered the course of history, how greed and the need for power have been fundamentally cruel to millions of unfortunate victims, how empires arose and collapsed around misplaced ideals of intolerance, superiority and the hunger for dominance. Students must be driven to wonder at Shackleton's courage and the indomitable human spirit that has made the homo sapiens unique in specie evolution. They must marvel at the disappearance of the Inca civilisation or the abrupt end to Mohenjadaró. *That* is history.

Just as the focus of school history hinges on irrelevance, the study of science is no better; it is absurd to teach the subject of centrifugal force, without actually demonstrating its application in a pump or vessel; this is the application of science for human development. Taking another example, can medicinal plants, the colours and fragrances of flowers and insectivorous plants be truly assimilated without experiential learning? These are topics that must include multiple experiences in the field, a grow-our-nursery effort, showing films and samples. This learning will then set the foundation for the conservation ethic; knowledge about the utility of a medicinal plant and its rapidly shrinking footprint makes the student take intelligent choices later in life and does not propel him or her into a career in Engineering, Management or Medicine, simply because these are 'in'.

Further, education for life means understanding the role of trust and inter-dependency in dealing with people, family values and conflict resolution, among other things. The absence of education in any of these vital subjects has meant that children grow up physically and intellectually, but lag behind in emotional intelligence. Teachers are trained to teach subjects of academic interest; I will assert (controversially, I'd think) that it is more important that they be taught skills to handle the emotional needs of children as well, to enable them to play the role of counsellors in the critical years of a child's development. About the role of teachers in teaching academics, I come to later.

Witness this excerpt from a talk by Sri Sri Ravishankar, the founder of the Art of Living Foundation:

“Only an education that can nourish inbuilt virtues can impart true intelligence. Today, it is the concern of every parent that their children should grow up to be well-educated human beings with certain values in their lives and that they should be happy. But somewhere along the line, the link to happiness appears to be getting severed.

We are losing the goal of happiness.

What a beautiful smile a child has, what joy and friendliness it exudes. But see the face of the same child by the time he passes out of school and college. Does it still retain that joy, that innocence, that beauty that it was endowed with as an infant? Is there a way to retain the innocence of a child when it grows older? If we can achieve that, then we will have attained something really marvellous; because innocence brings with itself a certain beauty.

Can't we introduce in our education system such values that will ensure that every child learns to be friendly? These days if you ask children how many friends they have, they will count on their fingers – one, two, three, four, five... Not more than that. If you don't know how to be friendly with the 40-50 children present in your classroom, how will you ever become friendly with the six billion people on this planet? The basic tendency to be friendly is lost somewhere in the pursuit of selfish education.”

Education without stress

Thankfully, the issue of stress on children is now receiving some attention. Why must a predisposition for arts and an aversion for arithmetic be faulted? After all, the overwhelming majority of the adult human population uses only the four basic arithmetic functions all their lives, and, almost always, uses the computer for the rest. The reason for teacher and parental dismay is a pre-conceived notion of success, in particular, academic success. Thousands of children have been driven to their death by this notion, yet the Indian literacy system is unprepared for change; every single year, in every state in India, there are reports of children who commit suicide as a result of their failure in the conventional winner-takes-all system. This is the most destructive manifestation of *muda*.

Children must study less. This means two things:

1. There must be less in quantity that is prescribed for a particular class and an increase in the quality of educational experience, that helps proper assimilation; and
2. Related to the above, repetition of subjects must be less than it is today. A number of subjects - the study of the solar system is one such example - are repeated up to six times in particular curricula over

classes three to ten. On each occasion, the stress is on repetition & memory and, occasionally, an obligatory visit to the nearest Planetarium (for urban children). Ask a child to enumerate 3 interesting facts about Jupiter and you will understand why mere rote learning six times over is a waste of effort, memory and paper. Can children study less subjects and, in a subject, less topics, but be clear in their minds on what they have studied, this clarity being induced by interesting media, questions and a fun-based approach? More on the 'fun' later.

The answer that I expect from school managements is a predictable one. We are helpless, they will exclaim, at the mercy of stringent standards set by a Board. Dig further and there will be another answer: the need to build the competitive spirit. More portions, they will say, separate the proficient from the not-so, the academically superior from those less inclined to academics. This is nonsense. Why is this competition necessary? To drive the vast majority, who don't score up to the expectations of the teacher to despair and pangs of failure? Is it necessary to show the World that a student can be classified as 'good' or 'bad' by the time she is seven or eight years old?

Education, I repeat, must be collaborative, not competitive. It must seek to involve the class in problem solving and discovery, rather than pit children (and their parents!) against each other. The process of competition is characterised by highs and lows; goodness knows how many crests and troughs each one of us has endured without the educational system adding to it.

The impact of this literacy can be most subtle. A friend, who runs a company that works with Indian and international organisations, tells me about the differences between dealing with Indians and others. When she needs to use information published by an Indian organisation and asks for permission, the answer is generally a 'No', sometimes polite, often brusque. European and American organisations tend to reply differently saying 'While this material is copyrighted, we can point you towards material elsewhere that is not'. There is a large difference in approach here: one competitive, the other collaborative, a difference in assumptions: 'I grow, but you shouldn't' in the first case, 'let me try to grow with you' or 'there is space for both of us' in the second. I hasten to add that generalisation is dangerous. Not all Indians fall into one category and others into another, yet the trend is most visible.

Teachers have an important role in inducing, or softening, stress. They need, more than anything else, to be kind and gentle; indeed the process of teacher recruitment - the process of interview and selection - should judge their fondness for children and their ability to relate to the multiple intelligences of a child, as much as technical prowess in the subject. When students display weaknesses or aversion to a topic or subject, what is needed is an appreciation of their strengths and a gentle recourse to corrective action, such as using creative methods of teaching. One reads of instances where teachers have

used mainstream films and theatre to teach Hindi, with considerable success. Similarly, children in rural areas can easily be taught geography and the physics of water with immediate recourse to their surroundings.

Education for today

The World today is vastly different from the World a generation ago, yet the process of literacy hasn't changed a bit. I refuse to believe that my fellow Indians who drive on the roads with little respect for others - even for children who are walking on the zebra crossing - who honk without purpose other than to vent their own frustration, who cut lanes with aplomb and who believe that in transporting a sick man to a hospital you are justified in severing the limb of one who comes in the way, are educated. What these fellow Indians have been subjected to is an academic system targetted at employability, not maturity; it is a system that rewards selfishness at the cost of the achieving a larger goal.

Let me take another example. India is recognised as a prime tourist destination all over the World, yet the Western perception of the Indian's attitude to a Western tourist is a source of much embarrassment. Why does this happen? Our education system again. A system that does not emphasise values at work, elevating it instead to the status of a 'desirable' rather than an 'essential' and leaves issues such as exploitation, materialism and greed to the individual's own sense of right and wrong. Education for today needs to change to incorporate these values, much more than the literacy machine does today.

At another level, I emphasise that these values are indeed more important than even technical knowledge. Lets take the example of an accountant, to illustrate the point. The computer system has effectively taken the accounting out of the accountant, leaving him free of the drudgery of keeping books. His job today is far more multi-disciplinary and multi-cultural requiring an understanding of other functions and geographies, where his colleagues work. This means an ability to understand people better, empathise better and work together, rather than against one another. Collaboration again.

Education as fun!

It is critical that the teachers be providers of interactive, visual education. As an example, multi media has taken over the role of providing information in colour and visual form, that is fun, interactive and rich. This is one medium; many others exist. Stories, discussion groups, experiential learning and games are four successful ways of combining intelligent learning with fun.

It is astonishing that professional education is as stupid in form as primary learning; witness how accountants are expected to memorise sections in Company Law, when in reality they only need to know how to use it (*muda*, again!). This is indeed a classic example of the need to grade overriding the need to educate.

Critically, the need of education today is to make the technical prowess of the teacher as *irrelevant* as possible in the learning process. With multiple media, the teacher becomes a facilitator of learning, rather than the source of it, the one who asks questions, rather than the one with all the answers. This transition is necessary is largely because India needs a million teachers today, and to expect a million enthusiastic, child-friendly educators is unrealistic, at the least. The transformation is easier to make with media, ie, the process, rather than with the individuals.

The finest way to make education fun is to make it inter-disciplinary. A study of water, for instance, is centred around geography, but has important bits of history in it, in addition to the physical laws and chemical properties it carries. When subjects get compartmentalised, the link between them is lost, yet most scientists will attest to the efficacy of thinking across disciplines. The celebrated investor, Charlie Munger, better known as Warren Buffett's partner, swears by multi-disciplinary knowledge in investing - he believes, for instance, that biology and human evolution is an important knowledge source for the stock market professional. As a further example, the Monte Carlo simulation, used in complex financial derivative pricing & trading, was first created for use in war and, later, to understand sub-atomic particle physics.

The Western Education system understood this need for multi-disciplinarity about two decades ago; a student today can major in post-colonial literature and macroeconomics under the flexible subject selection process, and still be accepted by the job market for the value of his core competence, embellished by multi-disciplinary learning. In this respect, India is a generation behind and, in the interest of education and a lively learning process, there is an immediate need to catch up.

Finally, a word on the burden that children in India, in particular urban children, carry on their backs everyday to school. Is this truly necessary? The answer is without doubt, poor planning by teachers who do not realise that

their individual insistence on bringing a textbook, a workbook and a notebook for each of their subjects adds up to the unhealthy weight of the school bag. No child can see education as fun, when it weighs on them every morning.

The answer to this is conceptually simple. I suggest that textbooks be 'torn' into chapters and that children only bring relevant chapters to school, a practice that is being attempted by a number of schools that are sensitive to the issue. Homework must necessarily involve exploring knowledge banks such as books in school libraries and the internet, rather than have parents do the exercises themselves merely to meet an uncaring teacher's expectation.

..and finally, on rural education

A final, and vital, point on rural education. Those who work on school curricula have generated identical syllabi for rural and urban areas within a state. This attempt at uniformity is the primary cause of the failure of rural education to educate the individual, since children in rural India simply cannot correlate their education with their immediate reality. The two subjects that result in the maximum amount of attrition - dropouts - are Mathematics and English, both of which are taught with the intensity and depth imparted to urban students. There are four reasons why this intensity results in failure:

1. English is not spoken in rural homes and children *think* in their language. Hence, sentence construction and delivery are faulty. The abstruse nature of the English language, constructed as it is with little logic and grammar and a propensity for form, does not make life easier for the rural student. I question the need for English at every level of the rural education system. Students in rural areas who fail in English should not be held back from future academic pursuit that might lie in a multiplicity of areas, unrelated to the language.
The issue with Maths is no less disturbing. The syllabus mandates that a rural student must be taught simultaneous equations in his ninth standard even though only two out of ten such children will move into non-farming professions in the current generation. When this student is asked why this knowledge is necessary, there is rarely a reply. In other words, the student sees no meaning or relevance in the learning process.
2. Teachers in rural India are often particularly weak in these two subjects at the high school level. Their own education has been based on rote learning and does not therefore equip them to teach English and Maths.
3. On any day, a quarter of the teachers are absent from school.

4. Parents in rural areas tend to be illiterate or marginally literate, unable to help their children with academics. The child is therefore on his own and must cope alone. The peer group is of little help.

This applies to three out of five students in India today.

At the high school level, the rural education system has achieved the unthinkable: reducing education to a system of certified illiteracy, let alone education. This was done by the State Governments who reacted to high failure rates in rural schools by imposing a pass 'target' on the Education Departments in their states, which was achieved suspiciously quickly. How? By lowering the quality of the examination and imposing pass percentage targets on teachers, in turn. The teachers were now incentivised to help students write their papers, rendering the process of examination meaningless.

Despite this naïve intervention by many State Governments, the pass percentages in states at the level of the tenth standard is dismal. The student feels dejected and drops out from the learning process, a decision that he will rue many years later. Yet, astonishingly, no one has learnt from the experience and the charade continues. The rural student is not taught subjects that connect his circle of comfort to the classroom such as the basics of soil and water conservation or farm economics, something he could easily relate to and learn more about from his immediate environment.

Importantly, the literacy system, by virtue of its approach, has subjugated the farming profession to the status of a last-option enterprise. Ask any farmer's son on his choice of profession and farming would be an unlikely answer. What the system has been creating is a sense of inferiority in rural students, without the commensurate opportunities for improvement. Further, eight of ten children being educated in rural India would spend the largest part of their lives in close touch with agriculture, a profession that is worthy of the highest respect. It is common today to see young 'literate' adults in a village idling time away, while their parents work in the fields. To join their parents is seen as an unacceptable compromise.

The literacy system does not equip the remaining two (of ten) children who migrate to non-farming professions either. They go through painful processes of re-learning, since their literacy is wholly inadequate in vocational training, factory or office skills or, indeed, in working on the computer (the last of which is now changing for the better, due to the many interventions by non-profit organisations set up by the information technology industry).

In summary, rural education has failed because:

1. It targets uniformity of the end product. In other words, this education is irrelevant to the child in the village.

2. It judges based on criteria that are designed to de-motivate
3. it subjugates farming to the status of a last-option profession.

The two *tasks* facing the State Governments in India is to make the rural education process *relevant* and *flexible*. This is not difficult. To help this happen, I propose the two following guidelines:

1. The only compulsory subjects for a rural student should be those relevant to his immediate environment. These include (but are not limited to) the study of the local language, soil and water conservation, essentials of farming - bringing in concepts from biology, physics, chemistry and geography that they can relate to -, health and hygiene, farm economics at a basic level (including the concept of banking and interest), Indian and local history and (in later classes) social organisation and civics and relevant Indian and State laws, to which they are subject.
2. Non-relevant subjects must be optional at the high school level (8th to 12th standards). Students who show an interest in maths, for instance, might wish to take it up further; others might choose to study biology or physics. The important aspect is that children be given a choice of electives, from which they select, say, four or five. Importantly, I recommend that English be made an elective.

The teachers in a high school now will have an additional responsibility: that of 'marketing' the course to the students. I imply that it is their role to convince students of the importance of the various subjects and help them choose based on individual proclivity. To emphasise again, remove as much as possible, the teaching role from the teacher. Make him (or her) a coach, a guide to the student.

I finally recommend that the system of a tenth standard examination be dispensed with and education be made open upto the twelfth. While I suggest this measure for rural education to become universal, relevant and meaningful, it is applicable to urban India as well.

An educated India is not just an important goal. It is **the** most important goal to strive for. A re-engineering, nothing short of a revolution, is needed to make this happen.