

# THE CALAMITY THAT INDIAN EDUCATION IS FACING AND INNOVATION AS A MEANS TO OVERCOME IT

(Innovative teaching and learning processes)

- AALHAD PARULEKAR (2011A3PS260H)

Circa 1909 : The Maharaja of Mysore allotted 371 acres in Bangalore to the Tatas for building an institute dedicated to producing world-class research in science & technology.

Late 1950s: Jawaharlal Nehru visits a former jail in Kharagpur and decides to convert it to a college which would promise the country's finest engineers. He also decides to set up more such colleges across the nation to remove regional imbalance. Why is it then, that after a disproportionate amount received from the government and having, arguably the best laboratories in the country, no truly path-breaking research has stemmed out of the IITs and IISc? Why has India not produced any Nobel laureate in Science or an Abel Prize winner since independence? (Hargobind Khurana and Venkataraman Ramakrishnan were not Indian citizens when they received the Nobel Prize). Why is it that, in spite of all the hype, none of IISc, IITs or even BITS for that matter feature anywhere in the top institutes in the world? (IISc. Is the top Indian institute, ranked 305 in the world. The IITs are outside the top 500.) Where exactly does the fault lie? Competence of teachers? Quality of students? Education System? In fact, a little bit of all three-going hand-in-hand, thus compounding the problem over decades.

A peep into the pillars of education would reveal a few facts:

There are three chief realms of the teaching-learning process :

1. Theoretical: The core foundations of any branch of knowledge. Usually consists of some theory, a few axioms and a handful of formulae.

2. Experimental: Has “Trial and error” as it’s pillars. No “fact” is accepted without testing and consistent observations lead to conclusions.
3. Realistic: Concerned with application of acquired knowledge to real life situations.

The largely apparent problems that Indian education is facing today is the gross imbalance of one of the three realms. Let us take a look at a few stereotypical extremes:

→ Extreme Theoretical: Very typical of the numerous cram-factories prevailing in our country, whether to manufacture Board exam toppers, entrance exam toppers, doctors, scientists or engineers. Coaching centres at Hyderabad (Narayana, Chaitanya etc.) and at Kota (Bansal, Allen etc.) provide excellent examples. This mindset of students and teachers continues for years with clearing exams, obtaining a degree and completing the prescribed syllabus becoming the sole motives of students and teachers respectively. The joy of the process of learning and it’s real-life applications are kept aside.

→ Over-Realistic: The students who fall in this category seem to be very smart. They have their entire life-plan figured out. They don’t care one bit what inspired Newton to formulate gravity or how Einstein came up with relativity. These are high-IQ boys and girls who will ace the entrance exams, get into a top institute to pursue a professional career, only to end up selling coke or soap or working in a bank in return for being paid several lakhs of rupees per month. In short, doing something that has absolutely no co-relation to their education. In the process, cheating the taxpayer whose money was used to subsidize his/her education and also the institute which strove to provide cutting edge facilities, only to be forgotten later.

→ The students whose education consists majorly of practical education are labeled “diploma holders” and are relatively looked down upon a lot in later stages of life.

What could be done about this looming danger to Indian education? The answer lies in a shift from a majorly one-dimensional approach to an eclectic, all round approach to learning.

Using multiple learning styles and multiple intelligences for learning is a relatively new approach.. Traditional teaching continues to use a limited range of learning and teaching techniques, mainly linguistic (Recollecting and reproducing text) and logical teaching (derivations, proofs of theorems) methods. Many schools still rely on classroom and book-based teaching, much repetition, and pressured exams for reinforcement and review. A result is that we often label those who use these learning styles and techniques as bright. Those who use less favoured learning styles often find themselves attached to various not-so-complimentary labels and sometimes lower quality teaching. This can create positive and negative spirals that reinforce the belief that one is "smart" or "dumb".

Research shows us that each learning style uses different parts of the brain. By involving more of the brain during learning, we remember more of what we learn.

A variety of learning styles ought to be included in the teaching-learning process, some of which are:

→**Audio-Visual**: Relying on images and sounds to record information...As the saying goes-A picture conveys a thousand words. Students will be able to understand a lot more by looking at a Van Gogh classic than read about the influences of culture on renaissance paintings. Analogously, instead of merely teaching how a transformer works, field trips to nearby electrical substations would provide a more holistic learning platform for students. Instead of simply deriving equations for motion of a pendulum, a live demonstration of its motion would contribute a lot more to the understanding of students.

→**Kinaesthetic**: This refers to the physical aspect of learning. Advance in technology has lead to computerization of many machines, the most common being the

oscilloscope. Most of today's students only know the wave-form that an oscilloscope will produce for a certain signal, without having the slightest clue about what goes on inside. A reemphasis should be made on the basics even though it appears (externally) unnecessary else we shall produce mere technicians instead of engineers. The same is true about engineering drawing. With hand drawing being replaced with mere mouse clicks, a heavy compromise is being made on the student's ability to visualize. While some might argue that the latter is a faster way of making drawings, one can certainly, in no way refute that a possible opportunity for multi-dimensional learning has taken a beating.

I remember my father's friend telling him: "I am a B.Tech. in Aeronautical engineering but not once in my four years was I taught how to fly a plane. It was all mathematical formulae for flight". Such is the plight of thousands of Indian graduates every year who are confined to the theoretical aspect of learning without ever experiencing the real-world charm of their respective disciplines. That friend of my father's, having now completed his Ph.D in Aeronautical Engineering now makes a living as a computer programmer. How ironic!

Recently, a lot of companies have been complaining about the lack of employability of the Indian graduate. The problem lies in the mindset of society, something which spreads its wings long and wide into the deepest roots of families. In a bid to compete against fellow peers for a glamorous (read well-paid) career, a lot of pressure falls on the student to excel in entrance exams to get into the best courses in the best colleges. What happens? Coaching classes thrive. Fees are hiked. Parental pressure surmounts. Further, there is a lot of hype for courses like Electronics & Communication, Computer Science etc. where children are pushed to, without having the slightest idea of whether he/she is even slightly interested in it. Consequentially, these students end up selling soap, as mentioned above, as their interests are suppressed for so long that their sole motive becomes minting money. People watch "3 Idiots" only for the sake of entertainment; they learn no lessons from it.

What can be done to overcome this hurdle? Innovation should start at the entrance stage itself. Current means of admitting students into universities are either

through board exams (repetitive questions which do not truly test the candidate) or entrance exams (leading to an explosive growth of coaching classes and an even higher level of stress for students.) Instead, an interview should be conducted asking the candidate why he/she wants to apply for a particular course, demonstrating their inquisitiveness at home, maybe with oil paints or poetry (for arts courses), mechano sets, hand-made radios or some animation with flash(for engineering courses), etc. This way, students will learn with increased vigour as they truly like what they are being taught and the same attitude will carry forward to their workplace.

Further, the artificial link between R&D and industry should be removed. A major fraction of undergraduate students get disillusioned by studies thanks to it's overemphasis on abstract topics like triple integration which have little connection with either their subject or their work but are relevant only for research. On the other hand, parents' forcing a research-oriented student to a high incentive job almost always steals the zeal for studies as corporate culture does not suit them. About a year or two into their graduate studies is sufficient time for a student to decide where his/her inclinations are, a decision which can save lot of resources for teachers and lots of agony for students.

There is no doubt that Indian education is in the midst of a bleak era as of now, but meticulous implementation of the above innovations can certainly pull it out of the woods.