

Technology, Education and Emerging Economies

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ABSTRACT: *Technology has brought innovation in educational practices globally .India has not remained untouched by technological development .This paper will focus on how India as an emerging economy deals with blending age old problems of a nation with teeming millions who need education with balancing of equality with excellence. Even in these circumstances academics have tried to bring innovation in educational practices to make education an enriching experience for the learner.*

Technology in education is not a novel concept. Since there have been teachers and pupils there have instructional tools to enhance the teaching learning process. The tools have ranged from slates, abacus, blackboards, pens and pencils, typewriters, overhead projectors, computers finally the internet, mobile phones and social networks. Technology is a powerful enabling tool which caters to educational change and reform. If used appropriately and discerningly, different types of technology helps in enhancing access to education and its quality, while making teaching and learning an interesting and interactive process. There has been an accelerated growth in innovation in teaching tools, yet the classroom challenges remain essentially the same _

- How do we communicate with our students?
- How can we challenge and motivate them to think for themselves?
- How can we use the tools at our disposal to enrich the classroom experience?

There is little doubt that new technologies open up possibilities unheard of previously. But these technologies will have a limited impact if the pedagogy behind their application is not appropriate. Technology is nothing without a teacher who has planned a lesson where technology has been woven intricately and seamlessly. Moreover with the advent of the Learner Centred Classroom, which places each learner at the heart of the classroom transaction, technological assistance will give the much needed fillip to the learners' endeavours. No two learners are alike. Each learner brings a unique mix of learning styles to the classroom. It is a huge challenge for the teacher to identify these learning styles and design activities which appeal to the class as a whole and yet take the individual needs of the learners into account. Technology is indeed a powerful tool that can be used to

differentiate learner needs and address them individually. We can see a strong correlation between learning styles and technology options. For example:

- For learners who are logical thinkers tools like excel spread sheet, online polls and surveys are appealing
- Those who are visual learners would enjoy working with digital cameras, video, and online resources such as Google earth
- Learners with a strong reflective side will feel comfortable blogging or building e-portfolios
- Even very physical learners have technology based options such as 3D worlds, virtual tours and animations

The intervention of technology has changed our outlook towards the whole teaching

The Indian Context _ Narratives for the future

If we survey the world around us it is evident that we are living in a watershed moment in the context of education. The biggest question that confronts us is “What do today’s learners need in order to be prepared for the society of the future?” Schools have to prepare learners for rapid change, the routine skills that were important at one point in History are no longer important. Schools have to become hubs of opportunities to foster ability to construct knowledge and creativity. Translation of this in practice means that teachers need to become catalysts, the key agents who can bring a new continuously evolving society into being. How would this mandate affect their role? As catalysts, teachers of a successful society need to:

- Promote deep cognitive learning
- Learn to teach in innovative ways
- Commit to continuous professional learning
- Build a capacity for change _ in themselves and the learning environment by trying out new ideas.
- Promote creativity
- Problem solving

The development of a robust state is always tied to education. The mode of education that has traditionally been in fashion since colonialism favours the privileged teacher entering a class comprising of generally underprivileged seekers. The teacher fulfils her duty by bestowing the light of learning on them. A knowledge society is characterised by continuous change in the socio – political context as well as in the expansion of information and knowledge. Citizens of such a society need to restructure their mind set to be compatible with this world. India finds itself at the threshold of such a change. It is essential that we study our nation from this point of view. As global technology advances swiftly, access to software and information is quicker and definitely cheaper. The revolution in technology will continue and so will the revolution in educational practices and the way we think about emerging nations.

The Indian economy over the last decade reads like a success story. After a major economic crisis in 1991 followed by bold reforms measures, the economy has experienced a

rapid economic growth and foreign investments. At the same time there has been a boom in the information technology sector. Technology has seeped into the lives of the common man in India in many ways. From mobile technology, to learning software we can see its evidence in all walks of life. The changing trend in education demands technology friendly teaching but the country is still struggling with decade long problems, like out of school children, drop-outs, teachers' shortage, lack of infrastructure, balancing between equality and excellence, common standard curriculum. This coupled with crushing poverty, social and political inequity, the rural and urban divide has resulted in a vast chasm between the have and have not's in terms of access to educational and professional opportunities etc. In such a scenario, it becomes highly challenging to even define minimum education criteria to meet the dream goal of Universalization of Education. In spite of all such challenges, the Government and academia have joined hands to bring innovation in educational practices to make school education a worthy experience for the child.

In India the Right to Education Act came into effect in the year 2010. This act makes education a fundamental right for every child between the age of 6 to 14 years. It's the first legislation of its kind in the world to put the responsibility of ensuring enrolment, attendance on the government. But at the same time the quality of education provided by the government remains a debatable issue. These problems are further accentuated by student and teacher absenteeism as well as mismanagement of funds and teacher appointments, a general malaise that afflicts Indian society as a whole. Children attending private schools are seen to be at a distinct advantage over their government school educated brethren, in terms of availability of appropriate infrastructure, latest teaching – learning resources, able and committed teachers and a conducive learning environment. These schools are attended by the children of economically and educationally privileged parents, who have the necessary monetary wherewithal to pay the exorbitant fees.

It is evident that there is a vast disparity in the Indian classrooms. On one hand we have classrooms equipped with state of art infrastructure in terms of a Smart board, computers for each student or at least access to computers in the computer laboratory, online submission of assignments, creating wiki, blogs as a conduit for learning. On the other hand there are packed classrooms with not enough space to seat the learners comfortably, let alone resources in the form of textbooks or technological intervention. This is a problem not only for the government but for all the teacher training institutions. How do we train our interns to teach in these disparate conditions? It is essential to redraft teaching strategies for different teaching contexts. The system of imparting quality education and training teachers to do it in diametrically opposed conditions needs to be revisited. The new vistas of knowledge and technology need to be integrated effectively while enhancing teacher competencies. Only then the evolving role of the teacher can be infused with a rigour that is the key to effective teaching.

The two faces of India: Cases from the field

We have been teaching the pedagogy of English and Mathematics (our examples will be mainly from these two disciplines) in teacher training programs run by the University of Delhi in New Delhi, the capital of India. Yet our pre service programs(under the aegis of the

Meta university concept or B.Ed./ B. El Ed) has to foster teaching competencies for varied and more importantly diverse needs. Interns need to be prepared to implement a new approach towards teaching.

Case study I

Any reform in education cannot make success unless we prepare our teachers to implement it effectively. The University of Delhi and Jamia Millia Islamia has initiated a remarkable step in this direction by introducing Masters of Mathematics Education under the concept of Meta University. The course itself is a unique venture in the field of education and technology because for the first time in the history of India, full-fledged course is being designed to dilute institutional boundaries by investing faith in technology. This unique course is a combination of teaching mathematics through technology based medium. The course incorporates multimedia tools in mathematics concept development. Though the course is only semester old but prospective teachers are getting wholesome experience in teaching of mathematics through technology.

The course has in-built vision of mathematics through technology. It heavily relies on the use of software such as, Geo-gebra, Mathematica, Matlab and Graph Cal. The prospective teachers are taught different school mathematics concepts using these software's. The students are encouraged to solve challenging real life problems peculiar to Indian Context by developing mathematical models using technology. The use of multi-media is also stressed upon. Students are learning to develop movie-based mathematics lesson plans that bring child's local context in mathematics classrooms.

Case Study II

The Preparation of teacher trainees or interns begins during the early stages of the training program, in the pedagogy class as well as the visual education module. Both the modules transact the course work in three phases_ The preparation, followed by on the field exposure and finally presentations and discussions with facilitators and peers regarding the planning of classroom practices their integration with technology and feasibility and effectiveness of such activities.

An example from the field, that is significant, is of using films as a pedagogical tool. One of the schools that was part of our School Experience Program of our teacher training program (wherein our students move to the field for forty days and translate theory into practice) was equipped with the latest technological aids to enhance the teaching learning process. Most of teaching was done using Smart Board in addition to the prescribed textbooks.

Shakespeare in the Indian Context

In a language class (class xi) students were initiated into the the intricate world of Shakespeare. It is a trial by fire in the most mundane of circumstances but in India it presents a major challenge_ since we are dealing with a multilingual classroom where learners are competent (in varying degrees) in English as a second language. Most of the learners were

acquainted with Mark Antony's speech from Julius Caesar from their course book in class tenth. In class eleven, the learners were exposed to speech of Macbeth_ "canst thou not...." a speech of great psychological import that requires deep reflection and analysis. One of our interns used screening of the film based on the play as a pedagogical tool for teaching. This was an important strategy that had been discussed in the pedagogy class as well as the visual education module, both working in tandem to create effective teaching plans , and acting as major scaffoldings for the interns in their journey into the field. One of the films was directed by Roman Polanski and the other was a Hindi adaptation by Vishal Bhardwaj(an Indian filmmaker). A movie screening for teaching literature is not a novel idea by any chance (in the Indian classroom it is often looked upon with quiet disdain). Yet it created a world of difference in an Indian classroom of students who were familiar with British culture and had made forays into Shakespeare, albeit unwilling ones. Polanski's adaptation of Macbeth is a psychological study of greed, ambition leading to tragedy and guilt. While Bhardwaj' Maqbool reworks Shakespeare' classic through the medium of Urdu in the context of Mumbai' underworld, it remains faithful to Shakespeare' essential vision. The rendering of a classical text through the medium of film in English and Hindi helps in removing the alien aspect of the classic. With the scaffolding provided by the movie genre the teachers' clichéd textual explanations are replaced by reading the text through a visual medium. The literature classroom becomes extremely engaging and interactive, while the ideological and cultural gaps are smoothened in the discourse. The conflict of Shakespearean characters caught in the grips of their own emotions, racial prejudices and societal mores is better comprehended when their adaptation in Hindi films takes up problematic issues of class, caste and gender of today's times, since this is a world they are familiar with, a world that they live in. Film and literary text interface created an ease in transacting the text with its unfamiliar idiom and syntax. The class was then divided in groups of four and discussions on the theme_ Comparing Bhardwaj' interpretation of Maqbool's tragedy as that of passion as compared to Shakespeare's' tragedy of greed and ambition. This interface naturally resulted in a discussion on how radical is the transformation of the tragedy and does it add to the understanding of the character and his tragic downfall. Another group compared the written text with its film adaptation, while the third group discussed the geographical and mythical context of the play, with the witches, and how it adds to its dramatic content. The ICT enabled rendering of a literary text is carefully woven by the intern to enhance the learner's critical thinking and collaborative learning. The module which gives the interns space to work with technology within the confines of a prescribed syllabus also opens their minds to the possibility of eliminating rote learning and creating room for critical and imaginative discourse between teacher and the learners.

The visual education module of the teacher training program exposes the interns to the possibility of creating an ICT enabled classroom. Their post field classroom interactions and discussions gives them greater clarity regarding the feasibility of such strategies. This is essential in today's world where most people show a high degree of compatibility with information communication systems like computers, internet, mobile phones, i-pads etc. Interns and learners alike experience heightened interest in the teaching learning process

when they find that the classroom learning activity simulates the world of gadgetry to which they are accustomed.

The Smart Board is also very effective in teaching language by means of authentic texts and analysing authentic texts by means of language. This makes grammar in its adaptability less boring as students can see a clear purpose and appreciate its value. In another classroom our intern taught a poem (Gabeba Baderoon "Art in Life- Life in Art"). The intern wrote the poem on the board. After having listened and read the poem they were asked to underline the verbs and verb tenses. The students could see that the poem could be divided into present, past, present, a journey, which is integral in the understanding the poem.

Case Study III

The first two case studies have described how our interns are exposed to ICT in the visual education module of their training program and how they weave technology with the teaching of a prescribed text. On the other hand this module also prepares them to use basic technology to pique the interest of learners who are studying in schools with not even the minimum infrastructure and are also many a time first generation learners. Sugata Mitra (TED) of iconic "hole in the wall" experiment has worked in the same circumstances . His experiment brought to light several startling results. The experiments carried out in the slums of Delhi (the capital of India), and the deserts of Rajasthan showed how a child's innate curiosity is enough to move up the ladder of learning.

In India, as in other emerging economies, we do not only have to provide education to teeming millions but at the same time have to contend with stark realities of lack of infrastructure, power outages lasting for days as well as lack of internet facility. These harsh ground realities have made us find alternatives. Our interns have used a single computer coupled with hand- made visual aids to teach simple English lessons to learners coming from backgrounds where English is not seen as a second or foreign language but actually an alien tongue. This actually adds to its exclusive status and social prestige.

Studies have been conducted in India that show that mobile phone networks are prolific and have access in the remotest corners of India's vast terrain. In such a social context the usefulness of mobile phones cannot be scoffed at. Its portable and affordable also it is essential to understand the relative advantage of this technology, to know its compatibility with current classroom practices. Some of the ways it can be used are:

- Electronic Dictionaries
- Mobile games : Learners can access online word games through web browser
- Learning and practice of English through sms (Short message Service).

Everyone from a humble farmer, plumber has a GSM mobile phone. It's a portable instrument that can be used for small business or just social networking. Everyone is therefore texting. So even in classrooms in poorly funded schools every student is texting his friends etc. It appeared to be a menace that could not be controlled even through corporal punishment. So when you cannot beat them join them. The solution which we as teacher educators found as viable was to make text messaging a part of the English learning process. Our interns gave the students in their class opportunity to text each other in class, read the

text (teacher approved) and grade them on the accuracy of their spelling and syntax. The practice of sentences of 140 characters or less were easier to handle for speakers of English as a second language. This was not a replacement of formal textual learning but it provided space to students to practice using English that was fun and easy. Mobile technology provided a free tool to enhance learning experience in a sustainable and enjoyable way. Instead of writing informal letters our interns have used the sms as means of note taking, note making and communication. The mobile phone is generally possessed by most learners therefore it is an important aid in language learning. Our interns have also used the recorder present in mobiles to record songs, poems and dialogues for listening by the whole class and in groups. In the classroom context the interns have recorded dialogues made by students in pairs or groups and then replayed them. This gives the learners opportunities to hear what has been recorded and give feedback regarding the relevance of what they have heard and try and fill the gaps with what they find lacking. This is a practical use of authentic material to foster language skills at the elementary school level.

The cases discussed above show how teachers have to be can be prepared to deal with disparate classroom expectations. The post field discussions are the most enlightening and give deep insight into the basic fact that fascination with technology at the expense of sound pedagogy is not the road to be followed. Technology has great potential but we must accept the ground reality that there is still a huge divide between teaching strategies of the analogue classroom of the emerging economies and the digital world that beckons us so provocatively. As teacher educators we have to work with both type of classrooms and make learning as enriching as possible_ for the learner, intern and ourselves, the teacher educators.

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