Technology in Education: Hopes and Aspirations of a Fidgety Generation

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Access to education, however cherished a goal for our society, remains out of reach for a large proportion of the population. Technological deployments would have to help reduce costs, improve efficiencies and in general expand the reach and its affordability. The steep slope of the barrier should appear surmountable at least, offering a guarantee of richer dividends after the climb. Drop out rates ought to drop sufficiently to justify the investments

The sudden upsurge of desires associated with new technologies is worth taking note of. Especially when one observes, that these technologies are but a few decades old. What makes these technologies so popular, so desirable, and so much of a hype about?

One very significant reason is the coloured screen. Gone are the days when the only source of information was the printed text and it was more often than not in black and white. One could argue that we did have coloured magazines or cinema screens which were coloured. But now one can think of one's own publication, made from one's own efforts with colours of one's own choice. Suddenly its spring time and no doubt leaves a very pleasant feeling.

A second very important reason is the personalisation of the device itself. When we thought of print, we thought of professional printing presses and persons who knew the art of putting together the fine print. Today we fire up a document, all decked up with the choicest of fonts, layouts and designs sent off wirelessly into the nearest laser printer, even from our smartphones. When we thought of photographs, again it was some very sophisticated gadgetry, accessible to only to a few, laborious processes to boot, which led to the film seeing the light of the day and then, one or two prints. Who could dream of a selfie taken atop a mountain peak sent off to a thousand friends, who would relay it to a million others in seconds, and even printed into the glossiest of magazines.

A third reason, no doubt, is the size of the device. The thinner the device becomes, the more powerful it turns out, enhancing manifold the desire to possess one. The convenience of carrying it around, the range of purposes one can put it to does make it irresistable.

The fourth and in my opinion the *raison d'etre* for the new technology is the ease of use. Almost noone I have seen toting one of these modern gadgets has undergone a training to use it. The more sophisticated these devices have become, the easier it has been to adapt to. Age, of course, has been a bit of a bother – the younger the person, the faster they have been able to figure out what else the gadget is capable of. With enormous research in design studies backing it up, behind

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the thin slab of *gorrilla glass,* lurking just a touch away, lies the enormous power of software applications, which by any stretch of imagination, even to the most doubting of thomases, appears almost miraculous. Be it a phone call across continents, be it a map, a photograph, a song, a video, or even a compass, a pedometer or a blood pressure guage, anything that can be packed into a few lines of code appears accessible to the most uninformed of us.

So, should all these features prompt us to plug the devices into our schools. It would indeed be very tempting. One could say, almost anything we do in our schools can be done better. Learning would become more exciting, children would begin to love learning, and performances of students, teachers and schools would sky rocket. While we shall examine these propositions shortly, it would be prudent to ground our desires around what we really want our students, teachers and schools to achieve.

Schooling is an investment in a students capability to learn. What one learns over the years one spends in school is to seek, gather, process information that exists all around. One also learns, leveraging the alphabet of language and mathematics, to manipulate the information and make sense of the data, the relationships, and phenomena which influence our lives and the world. One also learns to bring to bear one's innate capacities to create with the knowledge as well as the material world and express them in artistic ways. Looked at from this perspective, schooling is an investment in extending human potentials, in prompting the student to expand on human achievement towards an improvement of the quality of life. So, technological investments would have to improve our capacities to serve these goals.

Societies of the developing world, have begun their modern journeys, deprived of intellectual or material resources or in many cases, both. They have, for historical reasons, begun with handicaps, they have to overcome before they can make the most of modern day advantages. Access to education, however cherished a goal for our society, remains out of reach for a large proportion of the population. Technological deployments would have to help reduce costs, improve efficiencies and in general expand the reach and its affordability. The steep slope of the barrier should appear surmountable at least, offering a guarantee of richer dividends after the climb. Drop out rates ought to drop sufficiently to justify the investments.

In the mad race of catching up with the developed north, under a mistaken perception of what roads lead there, we have perhaps, disproportionately invested on higher education and that too in English. While the rich dividends accruing to the gifted few is often quoted as justification, the devastation it leaves behind in the multitudes of *also rans* is unaffordable. A neo-casteist outlook looking down upon hard work, innovation and creativity, a shameful disrespect for our moorings, our language, our culture is hardly a recipe for encouraging increased participation of our youth in pursuits of learning. Loss of languages leads to loss of cultural identities threatening the very fabric on which our society was built. While on one hand, modern day technology has made it easier for every individual to participate, the modern day barriers described above make it difficult to do so. Educational investments, perhaps correctives in our approach are necessary for technological investments to bear fruit.

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What is then called for is a deep understanding of the problems of Indian Education, a few of which are alluded to, for one to figure out the size and direction of technological inputs. One may not have the luxury of looking at micro examples and their successes from the western world to glean out technological canvases. Even in the western world where investments were not difficult to make, misapplication of technologies have shown how the technological gizmos do not, on their own, lead to educational outcomes. One must dare say, there are brilliant examples of what technology could have done. On the whole, however, researchers have sadly had to conclude that technology has failed to deliver.

While this should prompt us to refrain from over zealous investments, particularly of the *'lets buy tablets for all our children'* type, it may not be misplaced to believe in more critically designed, more pragmatically scaled applications in education. There may indeed be specific niche problems of the Indian educational scenario, which can be best addressed only by technology. Some of the technological possibilities appear to have immense benefits, prompting the most ardent critics to restrain themselves from saying. Let us examine a few such possibilities and initiatives.

India has invested on and developed one of the largest school systems in the world. Practically every habitation in the country has a school closeby. This wide distribution has also challenged the system from providing adequate resources, for instance, libraries.

One of the most popular technological applications has been that of digital and digitised resources. While web portals have been common and encycopedias like wikipedia have become popular, Indian counterparts are emerging fast. They serve the additional focus of contextualisation, localisation and a focus on our culture. The National Repository of Open Educational Resources (http://nroer.gov.in) is popular at the school level.

Representing various Indian languages and enabling teachers and others to participate in the curation of resources, this initiative is growing into a participative forum of all. Similar initiatives in the higher education space include the National Digital Library, a project initiated by IIT, Kharagpur and the e-Gyankosh, an academic repository.

A second popular technological application is that of online course delivery. The advent of Massive Open Online Courses, known commonly as MOOC has seen great interest in its scalability and reach. An initiative under the National Mission for Education through ICT (NMEICT) is the NPTEL courses (https://onlinecourses.nptel.ac.in/). Primarily aimed at engineering and technology, the platform already hosts hundreds of courses and is popular. A similar initiative by the University Grants Commission (UGC), known as e-PG pathshala focuses on developing courses at the post graduate level in a very large number of disciplines and subjects.

MOOCs have the potential to address a looming scarcity of teachers at all levels of education. They also have the potential of addressing a severe quality problem at the school level. Typically teachers at the school level undergo in service teacher training, which thanks to the numbers involved are delivered in a cascade model. An expert trains a set of key resource persons, who in turn, train other resource persons, who then train the teachers. Due to the inability of the system to provide uniform resources at each of these levels leads to quality losses. Also, the large numbers of teachers involved means not all of them can be covered for all content and frequently enough. The availability of the courses online or digitally has the potential of overcoming these constraints.

With the growing awareness of Open Educational Resources, the potential legal hurdles to access is also addressed. The concept of *open* refers to a licensing of the resource in a manner which allows for free retrieval, redistribution, adaptation and therefore freer access. This is particularly relevant in the context of translation into Indian languages, which mostly gets left out due to cost and absence of expertise in the local languages. There is a growing interest in Indian language content and translation on the web. Supported by digital initiatives of the Department of Electronics and Information Technology, the Indian Language Initiatives (http://www.tdil-dc.in/) has resulted in a large range of software applications and tools to support generation and management of Indian language content.

These initiatives augur well for the nurturing of an environment, which can overcome digital divides and address core issues of restrictive digital access. The goal should be to leverage these to enhance interest in every section of the society in problems which have denied access to knowledge, services and participation of people at large in the economic prosperity of the nation. ❑

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