



EVOLUTION FROM GURUKUL TO E-GURUKUL – TRANSFORMATIONS IN INDIAN EDUCATION SCENARIO

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ABSTRACT

The purpose of this paper is to deliberate upon how the education landscape is transforming in India. Education is a source for social and economic development. India has a rich heritage and contribution towards education. Information technology tools and the Internet are revolutionizing the education scenario in India. Accessibility, affordability, diversity of choices, richness of content, availability of study material, blend of teaching techniques and the interaction between the mentor / educator and the learner are changing the education scenario for India.

This paper uses Narrative Inquiry. The authors have been part of the education system as students and as a researcher and teacher spanning three and five decades respectively. A case study is also provided based on the collected data.

This Viewpoint paper indicates the rapid changes that are positively improving the education scenario in India. The opportunities far outweigh the challenges.

The finding of this paper establishes that there is a nascent market for e-learning technology and enablers. The schools can and should tap into the available pool of software applications as well as Internet resources to enrich their curriculum. Content providers will have to continuously evolve and think “outside the box” to present intelligent solutions that will find takers.

Education is a social leveler, one that acts as an instrument for financial security, economic growth and improvement in standard of living for people. Access to

affordable education is one of the key challenges for citizens residing in developing countries.

KEYWORDS: *Education, e-Learning, Access, Internet, Transformation.*

1. INTRODUCTION

Albert Einstein had said “we owe a lot to the Indians, who taught us how to count, without which no worthwhile scientific discovery could have been made.”

The oldest civilizations on earth include Mesopotamia (Sumer), Egyptian and the Indus valley. Remnants of Indus valley civilization have been found in Mohenjodaro, Harappa, Ropar, Lothal and Dholavira which have been well documented. The corner stone of any strong civilization is that they have a well – defined system of learning and mode of transmitting the same to subsequent generations.

India has a history of rich texts in the form of the Vedas, Upanishads, Gita, Ramayana, Mahabharata and the laws of Manu (also known as Manusmriti) to name a few. The learned ones, trained in these scriptures, usually played the role of teacher and mentor.

The earliest scriptures divided mankind in this country into four castes namely Brahman, Kshatriya, Vaishya and Shudra. This division was based on ‘occupational traits’ and not ‘janma’ (birth). The aim was to create a framework for society to function harmoniously. The Brahmins were the learned ones whose profession was to learn the scriptures and teach. Kshatriyas were warrior class followed by Vaishyas who were involved in trade and commerce. Finally, the Shudras devoted their lives to serving the other three castes. There are many instances of people who were born Shudras and went on to become rulers or sages. (It is only in the latter years that the whole caste system became highly distorted especially caste got assigned by birth thus giving rise to lot of social inequality and marginalization.)

Education, in the ancient days was imparted in Gurukul (Guru – dispeller of darkness or ignorance) where the students used to live with the teacher as part of their family. It served multiple purposes. The teachers chose their students. The teacher could observe his pupils continuously. Education in those days was all encompassing. The teacher was responsible for molding the entire character of his pupil. The pupil on successful completion of his education went ahead to do his ‘Karma’ which also happens to be ‘Dharma’. Knowledge was imparted and the pupils had to repay in the form of ‘Gurudakshina’ which can be construed as a fee which the teacher demanded but very unlike the present day structured system of compensation.

Eklavya, a tribal prince had approached the guru Dronacharya (Mahabharat) (who was the teacher of the Kuru clan) to take him under his tutelage. Dronacharya refused. Eklavya built an idol of Dronacharya and with his inspiration to learn; mastered the art of archery and paralleled Arjuna. Upon discovering the same, Dronacharya asked Eklavya for his Gurudakshina – his right thumb!

Over the centuries, due to influence of Buddhism and other cultures, education underwent metamorphosis on a regular basis. University of Nalanda became a major hub of education. The rulers spent generously for dissemination of art, culture and science. The Islamic incursions in India also had their share of influence on education. Finally, in the relatively recent past British rule on India has had deep impact in the education system. The performance of Indian students abroad in this past century can be attributed to this structured British education system and its emphasis on English as the mode of teaching instead of vernacular medium.

Owing to the changing social norms, family systems in India, the burgeoning population, socialistic political system and the steady economic inequality among the haves and have-nots, today many students do not have the luxury of completing tertiary level of education before embarking on a profession to fend for themselves and their dependents. Globalization and outsourcing of jobs to India has created a breed of workers who are filling in the human resource gap at an early age. There is a vast population of this human resource desiring higher education but are unable to let go of their professional commitments. The advent of Internet in the last two decades, and the development of alternate forms of education and learning like distance education programs including undergraduate and graduate courses, specific module – based learning and management development programs which is reaching the desktops and email boxes of students, is rapidly transforming how education can be accessed. It is also acting as a great economic and social leveler and helping in enriching the country's human capital. In a role reversal, education is today coming to students (in electronic format) compared to the Gurukul system of our past.

2. OBJECTIVE AND RESEARCH METHODOLOGY

2.1. OBJECTIVE

IT has enabled the usage of Internet as well as multimedia tools to enrich the education system which was earlier predominantly dependent on printed books and lectures from faculties in a class. This has revolutionized the way education is imparted and accessed by students over the ages. This **viewpoint** paper is based on the Indian scenario though the same might be true for other countries with similar profile.

The primary objective of this paper is to elucidate the major transformation in the field of education due to advancement in the area of information technology (IT).

Based on the data and findings, the paper presents the emerging trends in education at primary, secondary and tertiary level based on various parameters. These parameters are used in evaluating the opportunities that are being created for e-content development firms. A balanced view is provided by discussing the related challenges.

2.2. RESEARCH METHODOLOGY

2.2.1. OVERVIEW

Research involves investigation, study, exploration or examination of certain phenomena. The problem to be analyzed impacts the selection of the research methodology and the subsequent

research design. The two basic types of research methodology are Quantitative and Qualitative (Altermatt 2010).

2.2.2. QUALITATIVE RESEARCH

Qualitative research is useful when a real-life situation over a period of time is being analyzed. It helps in understanding a certain phenomena in depth. The methodology can be compared with “story telling” which gives lot of insight to the reader and listener and most importantly to the researcher. The aim is not to generalize ideas but to impart knowledge and create a concept. The most common techniques involved are group discussions and in-depth interviews. This is the method employed in this paper.

2.2.3. DATA COLLECTION METHODOLOGY

The data collection and information generation for this paper has been done using both primary and secondary sources.

2.2.4. PRIMARY DATA

Primary source of data is based on a relatively new qualitative method called Narrative Inquiry (Gudmundsdottir 1997). The paper also includes a small case study to highlight the significance of the topic. Case studies are a common method of conducting social research and falls under the category of qualitative research. This case study was developed based on the data collected as part of Narrative Inquiry. Data was collected in the form of conversations and informal interviews over a period of time with teachers as well as students who form part of the system.

2.2.5. NARRATIVE INQUIRY AND ITS RELEVANCE IN THE CONTEXT

“The model of the human mind has been assumed to be akin that of a symbol processor, a computer-like engine that allows us to manipulate successfully a range of symbols of which language is deemed the most significant. This view of the human mind is very limiting because it assumes that what we know, and are able to know. Because intangibles cannot be captured in the grip of such symbolic representations as questionnaires or surveys. – Prof Lakomski in “Managing with out Leadership”2004

Source: http://cognitive-edge.com/eventsfiles/85_090120_AMS-Narrative_based_research_.pdf
[10 June 2011]

Narrative research is increasingly used in studies of educational practice and experience, chiefly because teachers, like all other human beings, are storytellers who individually and socially lead storied lives (Connelly & Clandinin 1990). Clandinin and Connelly further state that “education and educational research is the construction and reconstruction of personal and social stories; learners, teachers, and researchers are storytellers and characters in their own and other's stories.”

“In narrative research, researchers describe the lives of individuals, collect and tell stories about people’s lives, and write narratives of individual experiences. As a distinct form of qualitative research, a narrative typically focuses on studying a single person, gathering data through the

collection of stories, reporting individual experiences, and discussing the meaning of those experiences for the individual.” (Creswell 2008 in this chapter on Narrative Research Designs) As Connelly and Clandinin also note, "Research is a collaborative document, a mutually constructed story out of the lives of both researcher and participant."

“Narrative inquiry is appropriate to many social science fields. The entire field of study is often used in disciplines such as education”. Source:

<http://writing.colostate.edu/guides/research/observe/com3a2.cfm> [10 June 2011]

Narrative researchers often “describe in detail the setting or context in which the participant experiences the central phenomenon”. The setting may include the participant’s workplace, home, social organization, or school. It is the place where “a story physically occurs” (Creswell 2008).

Narrative can be spoken or written (Polkinghorne 1988), having a story form (which normally has a plot, people, sequence, having a structured body like beginning, middle and end (Giovannoli 2008), explaining some personal experience like schooling, acquiring education, learning etc (Chase 2005, p. 652). Experience is complex and narratives are best suited to share them. Smith, 1981 defines narratives as “verbal acts consisting of someone telling someone else that something happened”.

A narrative is used to present a view. In narrative inquiry, data is gathered through stories from the participant’s life mentioning their experiences and what it signifies. Observational research is dependent on interpretation of experience and cannot be replicated as an experiment. Connelly and Clandinin (1990) suggest that qualitative inquiry relies more on apparency, verisimilitude and transferability. Qualitative research is conducted using multiple methods to reinforce the findings.

“Narrative research can be used to pilot a study and gather information that will help to design the most appropriate objective research tools; it can be used to gain greater depth into a small sample within the larger context of a population that has been surveyed with objective measures; or it can be used as the sole evaluation of a real-life problem (Greene 1994)” (Giovannoli 2008).

Narrative inquiry leads to understanding the subtle change in the landscape both for the participant as well as the researcher over a period of time. It helps in analyzing the change that has occurred and the possibilities in the future. The authors of this paper are themselves part of the system that is being studied and includes a teacher who has experience of the past and present practices of teaching thereby able to foresee possible transformations in the near future atleast. The topic has huge social implications in a country where access to education can help transform many lives and impact the economy on the whole.

2.2.6. CASE STUDY AND ITS RELEVANCE IN THE CONTEXT

Robert K. Yin defines case study research method as - an empirical inquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries between the phenomenon and context are not clear. Case study comprises an all-encompassing method – covering logic design, data collection techniques, and specific approaches to data analysis (Yin

2002; Noor 2008). This methodology allows collection of detailed and varied information about the case and then analysis of the same independently as well as in relation to some other similar case (McNamara 2008). The unit of analysis is the most important part in a case. It can be a person, event, group, company or an industry as a whole (McNamara 2008; University of Art and Design, Helsinki).

The unit of analysis in this paper is a primary school. The case is a descriptive one. The case has been written to describe and analyze the growth of IT usage in various functions in the school since inception.

This case has been written using data collected in due course of performing narrative inquiry with respondents. It is presented as primary data as the main information was detailed by one of the co-authors of this paper who has herself worked in the school for more than twenty years and has been part of the transformation herself.

2.2.7. SECONDARY DATA

The secondary data was collected using published literature in newspapers, magazines, corporate websites, web blogs and portals (both government and private). The concerned sources have been highlighted in the relevant sections of this paper as well as in the bibliography. This data collection formed the exploratory phase of this study.

2.2.8. REPORT WRITING

The report has been written with the objective of reaching a diverse audience by keeping the presentation simple, logical and lucid with examples to validate the points. Supporting information has been provided in the annexure for people not acclimatized with the Indian system to comprehend where we came from and where we are headed. The importance of the topic also gets adequately highlighted through the paper.

2.2.9. LIMITATION

The narrative inquiry was conducted with respondents from various geographic locations inside the country. A specific pattern of respondents cannot be established or replicated.

3. CASE STUDY OF JHB

Indian education system is just now opening up to this new phenomenon but the pace at which transformation is happening; there will be drastic difference in the coming decade. The following case study is a small example of larger changes happening in the Indian education scenario.

A descriptive case with single unit of analysis of JHB Sardar Primary English School – Evolution in teaching methodology – impact of information technology

3.1. BACKGROUND

JHB Sardar Primary English School, established in 1970, is run by a private Education Trust at Surat, in western India. The school caters to 1400 students of standard I to VII. The trust was established by a lady with very little education. The Satya Sai Education Trust also runs others schools for secondary and higher secondary students both in English and local Gujarati medium.

Initially, the JHB Sardar Primary English School was like any other school in India. The instructive method of teaching through blackboards and verbal exchange with students was in practice in the eighties. It took longer duration to complete the prescribed syllabus. The teachers were also responsible for manually preparing and maintaining attendance records, students' database, test papers for exams, mark sheets etc. Those were time consuming activities, prone to mistakes, redundancy and rework.

The school embraced evolving technology and computerization, as and when available and affordable. The outcome of such policy has been found pretty encouraging for both students and teachers.

Today the software and other electronic teaching aids are evaluated for content and relevance by the Principal in consultation with senior teachers. Based on their recommendation, the financial decisions are taken jointly by the Trustees.

3.2. BRIEF CHRONOLOGICAL GLIMPSE OF TRANSFORMATION

1996 – Introduction of Computer education as a subject with 45 computers in LAN

2000 – Multimedia as a teaching aid through LCD projector and large roll up screen.

This facility is provided in each class room. Additional CDs for special topics were also provided

2005 – Digital Language Lab with 70 computers, software like Waterford and Wordsworth from abroad were introduced for English proficiency of the students

2005 – Research Room with Internet connectivity for students and teachers

2006 – E-mail ID of the School & Website of the Education Trust is established jhbsardareng@gmail.com and www.ssetschool.org

2007 – Introduction of bulk SMS system for communication with Parents

2007 – Introduction of access to online results through Internet

2009 – Introduction of Interactive Board which replaced Black boards

3.3. VARIOUS USES OF COMPUTERS AND INTERNET FOR THE SCHOOL

Computer and internet facilities are now exploited as modern audio-visual teaching aid. Commercially available software and related teaching tools for specific subjects are being extensively used. Teachers prepare their course material in e-presentation slide formats, which are used repetitively. Students take advantage of Internet for their project work and submit e-projects. English language learning is aided by special software from UK and USA.

Preparation of students' database, student profiles, mark sheets and other administrative records are also fully computerized. This has reduced consumption of papers, made the school eco-friendly compliant and provides for easy retrieval of information. Examination results are available on the school website. E-mail is used regularly for rapid dissemination of all internal communications, circulars, notice etc.

3.4. PRESENT DAY SCENARIO

Today the student to teacher ratio is 40:1 approximately, though this varies slightly from class to class. Adequate computer terminals are provided in computer and digital language laboratory for each student of one section of a class to have access at a time. Research room Internet facility, however, needs to be time shared.

Day-to-day maintenance and upkeep of the systems is the responsibility of regular staff members. There is a backup facility by professional external agency through yearly maintenance contract.

Teachers role remain essentially same, though, now they use readily available educational software and their self prepared e-presentations for teaching specific subjects. With the introduction of multimedia as a teaching aid in the year 2000, the classrooms were furnished with LCD projectors and large screens. The strength of multi-media to communicate difficult concepts in lucid manner has been realized. The old adage "a picture is worth a thousand words" is true for multimedia. Many course-wares are now readily available in the market and these are routinely introduced to aid learning specific topics.

3.5. EMERGING SCENARIO

The school is committed to exploit features of available technology to the best advantage of learning process as well as administrative purpose. The introduction of Electronic Interactive Board has been one more step towards this direction. The features available with interactive board and e-pen have come as a boon to teachers. Mobile technology is also being harnessed to appraise parents about the progress of their wards. As technology evolves, adapting it requires training, practice and financial resources. The school is committed to march with the times and offer the students a platform to prepare themselves to compete with the best.

4. EMERGING TRENDS IN EDUCATION DUE TO INFLUENCE OF INFORMATION TECHNOLOGY ADVANCEMENTS

The advancements in technology especially in the area of communication are rapidly transforming the education scenario in India. Education has come out of the narrow confines of classrooms and the hallowed halls of institutions. It is now available in custom-made structure based on individual need, affordability and most importantly aptitude and time. The above case is an example of how education is being enriched and made appealing.

Liberalization and globalization are marching hand in hand and revolutionizing the contemporary elements of education and learning namely – accessibility, affordability, diversity of choices, richness of content, availability of study material, blend of teaching techniques and the interaction between the mentor / educator and the learner. The emerging trends in these parameters are manifesting in various forms at primary, secondary and tertiary level of education as specified in the below table.

	Primary Level	Secondary Level	Tertiary Level
Accessibility	Students can be reached in remote villages due to information and communication technology. Scientific tools used for primary students are enriching their learning experience.	Students can access additional teaching material, animation or visuals to understand and grasp concepts at their own time using the self-paced learning method.	Increased access to module-based tutorials, webcasts, podcasts, e-books to enhance knowledge or skills. The availability online makes it easy to study from anywhere at any time.
Affordability	Though individual usage costs are still high, the costs are lower when technology is procured by schools and used in bulk. Economies of scale come into play.	Some advanced copyright teaching material is expensive but value for money. Considering the prevailing school fees in average cities, the additional tutorials are worth it.	The distance learning programs and web-based e-learning modules are economical enough for this level of students who generally have a job to fund it.
Diversity of Choices	Various options are available based on curriculum, subject, cost etc and can be customized for students. The	The rote-based learning system at senior school level is fast diminishing as more e-based learning options are made	In this level, simple to highly specialized courses are available for students. One can get a diploma to a degree level course or

	Primary Level	Secondary Level	Tertiary Level
	dependence on books for learning is fast shifting.	available in the market. The emphasis is on understanding concepts using multi-pronged approach.	specialized ones like Six Sigma, Management Accounting, Leadership qualities etc.
Richness of Content	Internet helps provide 3D images which helps in visualizing compared to static pictures in books. The ability to conceptualize is highly improved.	The course books are amply supplemented with wider examples, vignettes and tests to improve the depth of learning and to think laterally.	The depth and breadth of content helps in students' ability to visualize a wider perspective and learn from more practical experience.
Availability of Study Material	Text books are now supplemented with e-content either available in DVDs or online from learning sites. This helps students practice more and learn. The horizon of the student extends beyond mere course books. Classroom session study material available on the teacher's webpage on a school website is useful for students as well as parents to monitor what is being taught.	Many websites and e-learning businesses offer tests and tutorial of specific subjects which helps students learn better for practical use and not to simply learn to get marks and pass tests to move to the next level. This also helps students to focus on particular problem areas in more depth. The web-based tutorials are an excellent option for self-paced learning compared to the staid pages of textbooks.	Study material that is available in portable document formats helps in ease of carrying and transferring to any location as well as referring and marking them. The e-books also come with advanced search features to refer to linked topics. It is much easier compared to physical books.
Blend of teaching techniques Interaction between	The blackboard teaching method is getting fast replaced by interactive boards	The teachers are now required to continuously enhance their competence in	The traditional role of teachers especially at the tertiary level is changing towards

	Primary Level	Secondary Level	Tertiary Level
educator and learner	<p>where alternate methods of teaching can be employed.</p> <p>Audio-visual aids are now used to teach phonetics and pronunciation. Waterford Early Learning Program is fast catching up in Indian schools. Students retain more when classroom sessions are not only about unidirectional teaching.</p> <p>Teachers are slowly moving away from the role of orators to mentors allowing students to learn at their pace as not all students have the same aptitude.</p>	<p>harnessing the power of Internet to connect better with their students. Many teachers are providing tuitions over the net.</p> <p>Students no longer confine their learning to course books. The dependence on teachers is slowly reducing the teachers are now expected to be more proactive and innovative in their teaching methodology.</p> <p>The blackboard is slowly becoming extinct. The new generation of students are highly comfortable with technology in general and are swiftly using the Internet to explore about there subjects and curriculum.</p>	<p>coordination and facilitation (mentoring) rather than focused classroom based teaching. The availability of lecture notes and study material apart from assignments and projects on the institution website is quite common.</p> <p>Teachers are using more of case studies, role play and real life examples to teach. The Internet forums are a rich source of information exchange and sharing of experience. The influence of forums cannot be negated.</p>

Recent ongoing developments which exemplify the above projected trends

Internet and multimedia tools have truly helped education evolve to an altogether different plane. Many courses are now available in full-time residential format as well as distance learning method with specific contact programs or webcasts to enrich it and enliven the learning process.

- The Department of Higher Education, Ministry of HRD, India; has recently launched a National Video Server managed by National Programme on Technology Enhanced Learning (a joint initiative of Indian Institute of Technology (IITs) and Indian Institute of Science (IISc)). 260 video and web courses will be freely available and more content will be added for all streams like engineering, sciences, humanities etc.

- The municipality corporation of Thane (district adjoining Mumbai) plans to introduce multimedia facilities in the 127 civic schools providing audio-visual content.
- IIT – Bombay (IITB) has developed a high-end application called lec-to-mobile (Chaudhari 2010) to view lectures live on smartphones.
- Mr. Kapil Sibal, union HRD Minister of India has been quoted as saying “Information is empowerment, and technology should enable everyone to access this information. There should be a free flow of this information. We cannot impose charges on it, because if a student is unable to access it, the state would be acting against the Right to Education”. (Knowledgenetworks.net 2011)
- A Sanskrit shloka translated into English says – Knowledge cannot be stolen by thieves, taken away by kings, divided among brothers or considered a load. It multiplies by expending and knowledge is the greatest wealth. In a press release on 4th February 2011, by Press Information Bureau, India, the establishment of National Knowledge Network (NKN) (Press Information Bureau 2011), (Government of India, Department of IT 2011) has been announced to create “knowledge society without boundaries” with applications like countrywide virtual classroom, collaborative research, virtual library etc. Under the aegis of NKN, it is proposed to open an e-library to benefit the students and doctors of Grant Medical College, Mumbai.
- Distance learning and e-content for schools and colleges are also being supported by growing number of companies catering to this market. Tutorvista.com helps tutor students from USA over the Internet with their tutors physically residing in India.
- S.Chand and Company, till recently a traditional publishing house; has tied up with Houghton Mifflin Harcourt to create high quality and rich education content.
- Educomp is another such company. These are just select examples.
- Many organizations are coming forward to use the power of Internet to reach out to like minded people and involve them in social causes like the TeachforIndia (Teachforindia official website) initiative. This is an important step towards combating illiteracy in India which is as high as 40%.
- The Eklavya portal by IIT Bombay is another initiative to help engineering students by sharing knowledge and insight to help them excel in their course. Dissemination of free education is a fast emerging trend in India owing to the power of technology especially the “information superhighway”.
- Tata Interactive Systems have their interactive system product called Classedge (www.tataclassedge.com). Apart from focusing on the technology part, the product covers the curriculum of CBSE, ICSE as well as state boards which is a plus as the product will be able to cater to schools across the country. Use of cloud technology will ensure that the content is continuously being refreshed and updated.

- Mexus Education in India has also launched a similar concept for education called Iken. These products are rapidly creating a virtual school environment where more students can avail well-researched additional study material over and above their school curriculum to master their subjects.
- The use of Internet is not restricted to just pure academics but is also revolutionizing other arts like learning music. A well known Indian singer Shankar Mahadevan has an online music school which teaches even students residing in the US.

The avenues are limitless for harnessing Information Technology tools to spread education. It is for teachers, students, entrepreneurs and companies to evolve and conceive newer ideas to enrich education and learning.

5. OPPORTUNITIES

5.1. ACCESSIBILITY

The need for education is ever increasing and due to the technological advancement, there is a huge scope to spread the access to good education by institutions so that they can reach students in far-flung area. Technology product firms also have a nascent market to serve. Accessibility of education for students will only grow in the years to come and investments in this direction will surely pay off. Accessibility is getting actively improved with broad band connections, 3G services by mobile service providers.

5.2. AFFORDABILITY

India is a price conscious nation. The affordability of educational material is of paramount importance. Satellite television company Tata Sky has special section called Active which has various learning modules for children – a nominal paid service

5.3. DIVERSITY OF CHOICES

Students are constantly on the look out for diverse subjects suiting their interest. Many new age subjects like Cyber Law, Hospital Management, Clinical Research Management etc are fast becoming popular. The same course can also be provided through multiple channels – in-house residential, distance learning with contact programs or totally web-based. Many entrance exams like the ones conducted by Prometric are online. The merging of boundaries will make the education business highly dynamic and open for all players. India has a huge opportunity to invade this knowledge space spectrum owing to its rich human resource in the education sector. IGNOU, Annamalai University, Sikkim Manipal University, Symbiosis, Pune are few institutions who are providing distance learning programs with minimum contact program, flexible learning and 24X7 support.

5.4. RICHNESS OF CONTENT

Books and teaching material are inching towards better and richer content. Graphical images are supposed to create better impression than text. It is stated that ancient civilization like Egypt had hieroglyphs for this particular reason. Reading and understanding the process of germination is entirely different when actually watching an animation of the same. Students in this competitive world will veer towards better content and a market lies open to be served. Companies like Educomp in India are making strong in-roads in this arena. NIIT in collaboration with Hughes Network is providing Management Development programs from IIM Calcutta.

5.5. AVAILABILITY OF STUDY MATERIAL

Course books are not adequate for in-depth learning. Availability of additional study material is the need for the day. Teachers are sharing their lecture notes, presentations on their web-pages for students. Internet has spurred the ancient Indian concept of sharing of education mostly free of cost. Publishers in India have a scope to extend their reach by sharing content. Google books facility with preview is a glaring example in this context.

5.6. BLEND OF TEACHING TECHNIQUES AND THE INTERACTION BETWEEN THE MENTOR / EDUCATOR AND THE LEARNER

Teachers now have immense opportunity to innovate their teaching techniques, moving away from blackboards and nurturing the questioning minds of the students through use of alternate technology, content from the Internet, imbibing teaching methods from more advanced nations which are the frontiers of education. The teacher's role is slowly shifting back to our ancient times where they were responsible for building character and not simply teaching the Laws of Gravitation. This inflow of contemporary information and use of technology (while teaching) will rejuvenate the minds of the teachers too.

6. CHALLENGES

6.1. ACCESSIBILITY

Accessibility of these new age technologies are highly limited in India. The success stories are confined to the cities. Real results will be visible only when the literacy levels of the country gets improved and more people benefit. Infrastructure is a bottle-neck that has to be overcome.

6.2. AFFORDABILITY

Barring the free content, much of the structured and rigorous material which has been scientifically developed along-with items like interactive board are still expensive and beyond the budget of many individuals, schools and colleges. The alternate solution is increase in fees which will deeply impact average students.

6.3. DIVERSITY OF CHOICES

Innovation in choices for students can be numerous but education is still controlled by the government as far as recognition is concerned. Companies also are still not very flexible in accepting non-traditional learning experience. The accomplishment of an in-house student of a university is still considered superior to a student who has completed the same degree from a distance learning program. The reason is the lack of an established framework and veracity of these courses. A change in the mindset and approach by the course – providers is a major challenge.

6.4. RICHNESS OF CONTENT

Rich content which generally entails good graphics, images, visuals, sound quality do not work well with average equipment. The same provided over Internet can be tiresome if the bandwidth is not adequate. As long as bandwidth does not become stronger and wider, much of the good content cannot be viewed effortlessly over Internet. The same cannot be downloaded easily. Large files over the Internet cannot be downloaded easily. Webcasts or webinars sound fascinating but will not be uninterrupted while viewing. The short term panacea of the bandwidth problem is use of virtual private networks. The costs of VPN are still exorbitant in India.

6.5. AVAILABILITY OF STUDY MATERIAL

There is a huge population of students in India who are trained in vernacular medium. English is mostly the second language for them. Many good international materials are not available in other languages of India.

6.6. BLEND OF TEACHING TECHNIQUES AND THE INTERACTION BETWEEN THE MENTOR / EDUCATOR AND THE LEARNER

The quality of teachers in India (in general) is still below average. Teaching is still not considered a glamorous and highly prospective occupation. People opt for it as a last resort. Compensations are improving gradually but really committed teachers remain fewer in number. Though Government frames policy for right to education, the implementation and monitoring system will require to be strengthened in municipality run schools.

7. CONCLUSION

Information technology arena is developing at a rapid pace. The power of Internet is here to stay. Innovation in technology and content delivery compounded with aggressive invasion of mobile technology is changing the entire facet of education world over and in India too.

Physical boundaries are being shattered and newer frontiers claimed in the field of education. The vista has opened up to an extent unheard of in the past. Education is a great leveler and the more it is shared, the more it gets enriched. Lives undergo upliftment and enlightenment with access to education. Nations benefit the most if its population is educated. The revolution is at its grass root level in India but the momentum is building up fast. There will be series of knowledge explosions in the future and more people will benefit than ever before.

There is a prayer which is recited in Kendriya Vidyalayas (schools under the purview of Central Government) every morning. It is an excerpt from Bhadaranyaka Upanishad, 1.3.28, highlighting the gist of the purpose of education:

Om asto ma sadagamaya, (From ignorance lead me to truth)

tamsoma jyotir gamaya, (From darkness lead me to light)

mrityurma amritam gamaya || (From death lead me to immortality)

The transformation in education will achieve just what the prayer says in the coming years.

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ANNEXURE

GENERAL OVERVIEW OF THE INDIAN EDUCATION SYSTEM

The Gazette of India, Extraordinary, Part II, section 3, sub-section (i) No. 180 dated 9th April 2010 pertaining to Ministry of Human Resource Development (Department of School Education and Literacy) notified and made into a law the Right of Children to Free and Compulsory Education Act, 2009 (official website of Ministry of HRD, 2011).

This is a huge step for commitment of the government towards providing education especially to children between the age group of 6-14. The literacy level of this nation today is abysmally low. Religion, social system, caste and poverty have huge influence on the attitude of parents towards education and its importance for their children.

Education in India falls under the purview of both central and state government. The approach towards education varies from state to state with southern states of India showing more involvement and higher literacy levels across economic class. The fact that both set of parents are themselves educated leads to higher probability of their children acquiring knowledge irrespective of gender (Borooah and Iyer, 2005).

Since Independence, education in India was more book-based and students were used to learning by rote. The schools, colleges and universities in India are affiliated to either the state or central government. In the recent past, autonomous institutions have come into existence. Private schools today are also required to follow a particular curriculum.

The schools have mainly three boards –

Central Board of Secondary Education (CBSE),

Indian Certificate of Secondary Education (ICSE)

Secondary School Certificate (SSC - State board).

Each state has its own universities to which all colleges are also affiliated. The education system consists of 2 years of kindergarten followed by 10 years of schooling, 2 years of higher secondary school/ junior college, 3 years for undergraduate degree in arts, science and commerce. For students of engineering, undergraduate course duration is 4 years and medical sciences 5 years. Post graduate courses are generally of 2 years.

Education in recent times starts as early as 18 months when children join play school. 50 years back there was no concept of nursery or kindergarten. School consisted of 10 classes which could be completed in 10 years followed by 2 years of intermediate course for Science, Arts and Commerce; another two years was needed to complete under-graduate course. Engineering students had to study for 10+1+5 years to get a degree. Exams and marks were an integral part of the education system. There were very few schools for children with special needs.

Over the years, the education system has been continuously evolving. The evaluation system is also undergoing rapid change. Today there is a system of relative grading instead of marks to calculate how much a student has learnt in an academic year. This helps shift the focus from rote learning to practical experience and improvement in grasping concepts and methods. Learning Pythagoras theorem is not an end in itself. It is the means to an end.

The advent of Information and Communication Technology (ICT) tools are making inroads into Indian education system but its access is limited to cities and good schools. The HRD Ministry has clear plans in the form of Draft Policy on ICT for School Education. There is also a section on ICT for Open and Distance Learning as well as network connectivity for schools in the Annual Report 2009-2010, (pp. 6-7) by the Ministry of HRD. Vast number of our students attends government school that need more funding to enrich the teaching system. The student teacher ratio is another area of concern where ICT tools are proving to be helpful. The lack of individual attention is overcome by providing audio-visual media to students to observe and learn self-paced learning modules and attempting activity sheets to do a self evaluation.

A structured approach of teaching and learning is necessary at the primary and secondary levels but tertiary level is better managed with mentoring and not hand holding. The role of teachers is evolving too. The availability of open learning system, distance education, web-based tutorials are all helping break the barriers to education for students and allowing more people to enhance their skills at their own time. This modernization of education is helping fill the knowledge gap that exists when students are unable to attend formal institutions. It helps in breaking physical boundaries which create obstacles.

Imagine the explosive change in the education landscape if students can access courses conducted by US or European universities while residing in India. The implications will be far reaching.

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