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EDUCATION : KEY TO SUCCESS

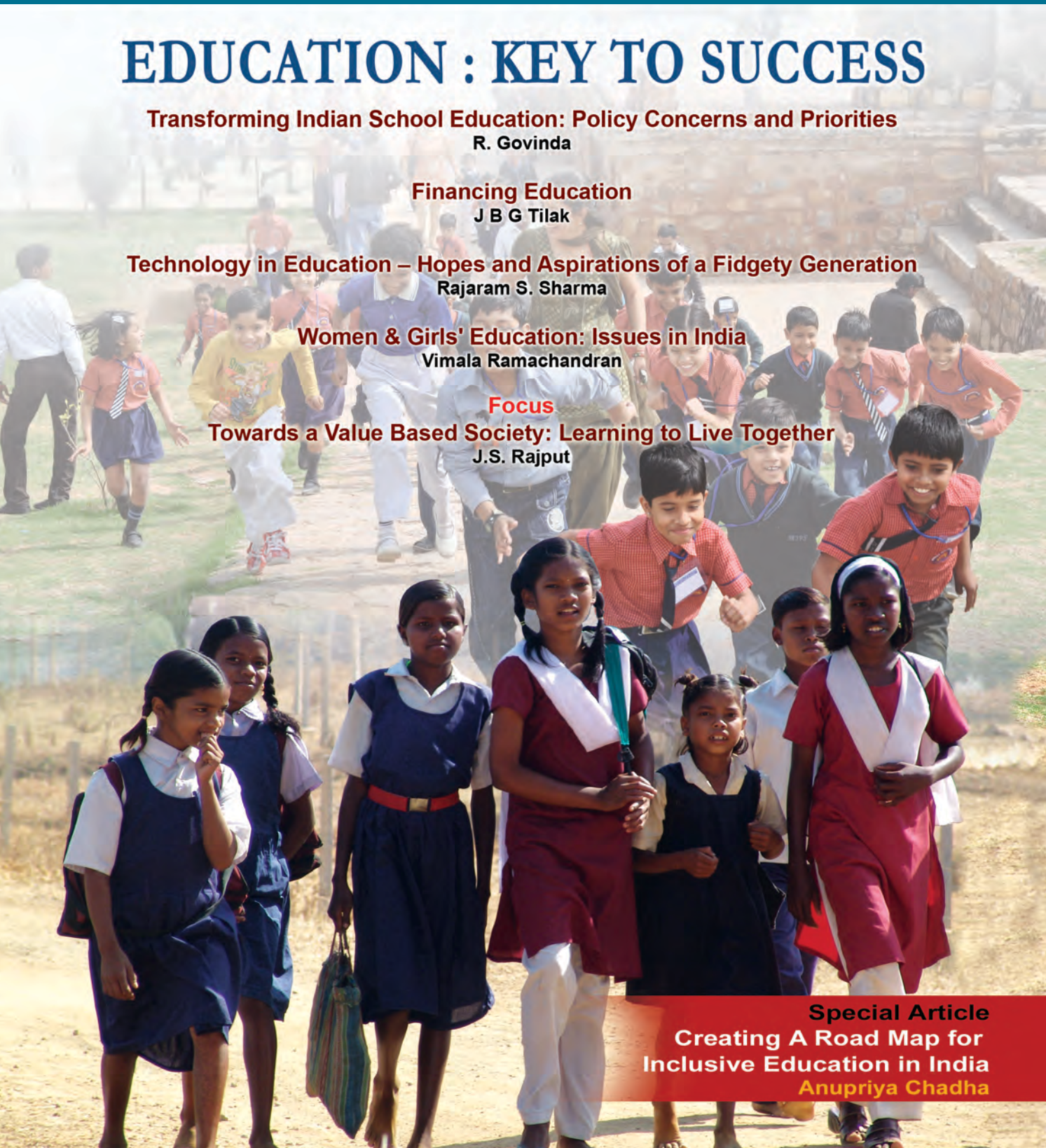
Transforming Indian School Education: Policy Concerns and Priorities
R. Govinda

Financing Education
J B G Tilak

Technology in Education – Hopes and Aspirations of a Fidgety Generation
Rajaram S. Sharma

Women & Girls' Education: Issues in India
Vimala Ramachandran

Focus
Towards a Value Based Society: Learning to Live Together
J.S. Rajput



Special Article
Creating A Road Map for Inclusive Education in India
Anupriya Chadha

The "GIAN" - An Interface Initiative Launched

"The Global Initiative of Academic Networks" (GIAN) programme was launched recently as a catalytic programme of the Ministry of Human Resource Development to enlarge and deepen the interface between India's institutions of higher learning and globally recognised institutions of academic eminence. Under the programme, faculty from highly rated institutions abroad will visit India, interact and partner with their counterparts and with students, and deliver specialised courses over the next year.

Faculty from 38 countries including 46 academics from the USA, 9 from the UK, 6 each from Germany and Australia, and 2 from Israel are presently scheduled to deliver courses, The list also includes Russia, Japan, Singapore, Sweden, Switzerland, Portugal, Netherlands, Malaysia and South Korea. This remarkable array of academicians will span 13 disciplines and 352 courses to be taught in 68 national institutions.

The courses vary in duration from 1 week to 3 weeks depending on the subject and are available free for students from the host institution, at nominal charges for others and webcast live as well. Webcasting will allow students across the country to benefit, in real time, providing access to high quality educational content. To encourage and make possible continued access to course content and delivery, it would also be placed on the website of the concerned institution.

These lectures would be made available later to the students across the country through the SWAYAM, the MOOCs (Massive Open Online Courses) platform and the National Digital Library. A web portal (gian.iitkgp.ac.in) has been designed by IIT Kharagpur to allow electronic registration for these courses.

Joint Initiative for Research in Technology Challenges launched

'IMPRINT India', a Pan-IIT and IISc joint initiative to develop a roadmap for research to solve major engineering and technology challenges in ten technology domains relevant to India was launched recently.

The objectives of this initiative are to (1) identify areas of immediate relevance to society requiring innovation, (2) direct scientific research into identified areas, (3) ensure higher funding support for research into these areas and (4) measure outcomes of the research effort with reference to impact on the standard of living in the rural/urban areas.

IMPRINT India will focus on ten themes with each to be coordinated by one IIT/IISc, namely:-

(a) Health Care - IIT Kharagpur, (b) Computer Science and ICT – IIT Kharagpur, (c) Advance Materials – IIT Kanpur, (d) Water Resources and River systems – IIT Kanpur, (e) Sustainable Urban Design – IIT Roorkee, (f) Defence – IIT Madras, (g) Manufacturing – IIT Madras, (h) Nano-technology Hardware- IIT Bombay, (i) Environmental Science and Climate Change – IISc, Bangalore and (j) Energy Security – IIT Bombay.

India Launch of Inactivated Polio Vaccine (IPV)

The injectable Inactivated Polio Vaccine (IPV) in India was launched recently as part of India's commitment to the "Global Polio Endgame Strategy". The Government of India is introducing IPV into its routine immunization program along with oral polio vaccine thus marking a landmark step to provide double protection to Indian children and securing India's gains of polio eradication. In the first phase, this vaccine will be introduced in six states, viz Assam, Gujarat, Punjab, Bihar, Madhya Pradesh, and Uttar Pradesh. IPV injection will be given to children below one year of age along with the third dose of the Oral Polio Vaccine (OPV) at the routine immunization sessions free of cost. Introduction of IPV in routine immunization is as per recommendations made in World Health Assembly in May, 2015 and endorsed by Global Polio Endgame Strategy.

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Let noble thoughts come to us from all sides

Rig Veda

CONTENTS

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Chief Editor's Desk

Education for Change

"Education is the most powerful weapon you can use to change the world"

- Nelson Mandela.

The above famous quote sums up the cardinal importance of education and it is all the more true as far as our country is concerned. As a young democracy, India is growing in leaps and bounds on the education front. The farsightedness of the founders of the nation in providing ample importance to educational growth has paid rich dividends to us as a Nation. Historically, education occupied prominent position in India. The priestly class in ancient India studied to gain knowledge while the kshatriyas and the vaishyas studied for specific purposes like statecraft, warfare or running a business. The ancient learning systems were oriented towards earning a living. Internationally also India was the top destination for students from other countries coming in for higher studies. Nalanda, one of the biggest centres, had all the branches of knowledge, and housed up to 10,000 students at its peak.

After Independence, the policy makers worked hard to transform the elitist system of education created by the British into a mass based system, built on principles of equality and social justice. Right to Education was made a fundamental right with the formulation of the Right to Education in 2009 and a National Education Policy was also announced. Subsequently, policy makers tried to universalize education through measures like the Sarva Siksha Abhiyan and Mid Day Meal scheme.

Today, India enjoys a pride of place in the international arena not only as a fast emerging economy but also as a vast pool of powerful human resource consisting of suitable and educated personnel. Highly educated, tech-savvy and scientifically trained Indian citizens are engaged in a variety of employments in every nook and corner of the world doing India proud. One of the note-worthy achievements over the years has been the increased literacy level. At the time of attaining freedom, India's literacy rate was just 12 per cent. Today, as per 2011 census, our literacy rate comes to 74.4 per cent. Kerala with 93.91 and Mizoram with 91.58 per cent lead and inspire other states to achieve further heights.

There have been challenges and shortcomings in this journey too. Access to education is still a dream for many, especially in the remote and rural areas where there are no school buildings or even possibility of reaching the school during rain or snow. Equitable educational access to tribals, marginalized, SCs and STs is a major point of concern with policy makers trying to bring them into the nation building process. Inaccessible schools become safety concerns as also lack of toilets for girls in rural areas resulting in alarming levels of drop outs. Children with special needs have invariably been relegated to the unseen corners while planning for education. These issues are now being recognized and the government is working on several initiatives for inclusive growth of these sections of society on priority. Technology is being used to provide better access to education through several programmes like GIAN, SWAYAM and National Digital Library. Inbuilt monitoring and effective assessment systems, vocationalisation of education at high school and college levels have also been recognised as the need of the hour.

The spurt in education and desire to fare well however, has led to a perturbing situation where there is a lot of stress on the students for achievement and performance. With the child being viewed as a product of the mechanical education system, the emphasis on the personal growth and life skill development has been overlooked. The individuals being churned out are unable to think for themselves or to assume ownership and take independent decisions. The education system needs to enable a child to deal effectively with the challenges of society by enriching the school curriculum with life skills training programme. In 2012, the CBSE introduced life skills training programme as part of Continuous and Comprehensive Evaluation targeted at the adolescent students between 10-18 years of age. Sarva Shiksha Abhiyaan (SSA) has under its agenda, the life skills training for the upper primary girls along with providing quality elementary education. Value based education also becomes necessary for the all round development of the child as a citizen of the country which can be achieved by focusing on value inculcation, nurturance and development at the school and college level.

With miles already travelled, the continued focus of the government would enable the country to build individuals who believe in themselves and are able to serve the real purpose of Education i.e. nation building and shaping our future generations. ❑

Transforming Indian School Education: Policy Concerns and Priorities

R Govinda

The new education policy has to envision a new world of values and ethics of learning to learn and live together. If such a policy has to be substantive and not merely rhetorical it must be based on shared values and experiences of people living in this vastly diverse cultural, linguistic, and economic context

It is more than six decades ago that India embarked on the task of transforming the elitist system of education inherited from the colonial past into one that is mass based and built on principles of equality and social justice. The task has not been an easy one. The country also had to contend with galloping population neutralising the progress made in getting children to school and ensuring quality education for all. This endeavour, stretched over more than six decades, has witnessed several significant policy measures resulting in remarkable progress as reflected in near universal enrolment of children in schools. One of the most defining moments in this journey has been the amendment of the Constitution making education a Fundamental Right and adopting the corresponding Right to Education Act by the Indian Parliament in 2009. The country has also embarked on the ambitious path of making secondary education universal and ensuring equitable access to higher education for all. These achievements and policy measures have raised new expectations for the future.

Having achieved near universal enrolment of children in elementary stage and enormous expansion of access to education at all levels the country is poised to move on major initiatives on the quality front and to ensure that children not only go to school but also receive quality education. But this demands several policy reform measures refocusing our attention and investment of resources on certain priority areas. Furthermore, quality improvement has to be ensured without jeopardising the concern for equity. In this brief article I try to highlight some of these steps in school education critically needed for further progress in provision of quality education for all.

Moving Towards Consolidation

Traditionally, both central and state governments have been following supply based approach for locating social sector facilities, in general and for locating schools in particular. This was necessary in order to ensure full enrolment of children in schools. However, this has led to considerable amount of irrational considerations in the distribution of available resources and consequent imbalances in educational facilities. The top-down supply approach has also led to considerable non-utilisation or under utilization of facilities. A major issue that has emerged in recent years is that of small schools in terms of enrolment that are economically

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and academically unviable to provide quality infrastructure and academic facilities such as library and laboratory and so on. In fact, majority of the primary schools in the country have less than 100 children enrolled. This includes substantial proportion of schools that have less than 50 students or even less than 25 students. A progressive policy of consolidation has to be put in place as the situation is going to become even more challenging with the swift demographic shift taking place in many parts of the country; with falling birth rate, the cohort entering primary schools has begun shrinking and the trend is likely to gain further momentum in the years to come.

Such a policy of consolidation has to clearly move towards new framework for establishing new schools as well as combining the existing ones to create viable schools of good quality This would also demand examining alternate means of facilitating participation of children through provision of transportation and residential facilities. The need is urgent as small schools which generally get located in the fringes of villages are invariably inhabited by marginalised groups leading to further accentuation of inequities even with access to school. Therefore, question of properly equipping every school with adequate material and human resources should be determined based on local parameters such as the size and location of the school and the accessibility to neighbouring habitations. It may not be desirable to fix a national norm in this regard.

Primary School: Too Late to Begin Education?

There is increasing empirical evidence to suggest that by the time children reach school-age, it might already be difficult to stop certain types of exclusions. Indeed, a large body of literature in neuroscience, psychology and cognition makes the case for early childhood interventions. In particular, it is clearly established that nutrition and cognitive stimulation early in life are critical for long-term skill development. Undernourished children have higher rates of mortality, lower cognitive and school performance, and are more likely to drop out of school. Thus, learning starts well before the formal entry of the child to the primary school. Indeed, there is a widespread conviction among educators that the benefits of pre-primary education are carried over to primary school. In particular, it is observed that teachers identify lack of academic skills as one of the most common obstacles children face when they enter school. Also, they perceive preschool education as facilitating the process of socialization and self-control necessary to make the most of classroom learning.

It is within this context that institutional support for children before the school age has gained considerable attention in recent years, particularly with respect to health and nutrition programmes. School Readiness Programme and/or attaching pre-school classes to primary schools have been used as means to increase opportunities for girls' education by freeing them from looking after younger siblings. India has a massive programme under the banner of Integrated Child Development Scheme to provide development support to children in the age group 0-6 coupled with prenatal and post natal care facilities for mothers. Yet, the progress is quite slow and commitment of resources is quite inadequate. It is worthwhile to work out an independent policy on preschool education to be pursued along side school education.

Working Children: Issues

For many of the poor, life cycle begins and ends, one generation after another, in a small world of debt and servitude. Deprived of basic education and steeped in intergenerational debt traps, there is no escape route available from the miseries of life. Placed in such conditions people tend to react in unusual ways. One such means is the engagement of small children in remunerative labour which severely affects their education. Yet, education is the only means they look to for liberating themselves from the misery. Perhaps with the exception of some very abusive or callous parents, most parents even from the poorest families would prefer to withdraw their children from work if they can afford it. So the main approach should be to create such conditions that enable parents to send their children to school. An important lesson to note is that mere advocacy on banning child labour is not enough. It is essential to design policies that help delineate concrete alternate programmes of education which effectively take children out of work.

Investing in Teacher : Investing for the Future

Teacher is the central actor to tackle the quality issue. There are several issues related to teacher that need to be addressed with appropriate policy measures. Recent Teacher Eligibility Tests have revealed that a large proportion of the teacher-aspirants do not qualify despite having requisite academic and professional degrees. This highlights the poor quality of the aspirants who seek to enter the teaching profession. While this could partially be offset by improving the preservice teacher education programmes, the real answer lies in addressing the professional needs of the practising teacher on a continuous basis. This issue cannot be tackled adequately through the occasional in-service training programmes organized under SSA or RMSA. Instead it is time to develop a proper policy on professional development of the school teacher. Such a policy should incorporate several critical elements such as subject matter upgradation and use of ICT. The vision should be to provide opportunities for lifelong learning for improvement and upgradation. The policy should also effectively link participation in professional development programmes with career prospects. A corollary of this would be to present an integrated perspective on teacher support and supervision. Besides these measures, in order to instil a sense of ownership and institutional commitment among the teachers, the policy should be to appoint teachers to specific schools. It is time to question the colonial

practice of appointing teachers to the system and not to the particular school. The issue is debated repeatedly, but centralized control over teacher posting and transfer is too powerful a political tool that no state government seems to be ready to act. Finally, despite the recognition of the centrality of teacher, in the traditional management framework, the education authorities as well as the school teachers and even the community members tend to view teachers only as passive recipient individuals whose role is only to implement the decisions made for the larger system. Using the agency of the teacher to transform the classroom processes with focus on learning requires a fundamental shift in school governance. But, how would this change be brought in? This throws a major challenge, as this would require new sets of skills and attitude among all the stakeholders. The traditional programmes of teacher education and in-service programmes for headmasters and administrators should be geared to meet this challenge. These are important questions that need to be urgently tackled.

Reshaping the Gender Discourse in Education

Many consider that the problem of universal elementary education in India is essentially a problem of girls' education. Though positive change is visible in recent years in terms of decreasing gender gap in school enrolment across all states, are we doing enough with respect to education of girls? Several factors seem to be impeding the education of girls. Girls are doubly affected by the absence of effective early childhood education programmes as they are invariably burdened with the responsibility of caring for the younger siblings. Distance norms for opening middle schools work against the interest of girls as often they are not allowed to go out of the village for schooling. Further, provision of basic infrastructure and women teachers in the school could considerably influence the situation as indicated by recent efforts through various primary education projects.

It is important to recognize that not getting the girl-child enrolled in the school, leaving the school without completing the elementary cycle, or deciding to withdraw the girl child from the school midstream, or deciding not to go to upper primary school or secondary school – for statistical purposes these are just events and the children get categorized and counted as unenrolled, dropout and so on. But in reality, exclusion from schooling is not just an event or a statistic; not a momentary decision but a complex process involving many factors in the personal life of the child and the family. When a girl drops out of the school, many events precede shaping the course of action – some located in the family, some located in the community and the peer group, and many located in the school where the girl is supposed to be studying. Understanding exclusion demands exploring these turns and twists in the personal life history of the young child. Such an exploration cannot be done merely by asking questions to the parents and teachers or even the children themselves. It requires tracking children individually and in groups as they join the school, move up the grades or leave the school. This would be critical for building a description of the complex processes involved in exclusion and delineating the underlying causes. Policy to address this process will have to be linked to local dynamics that surrounds the girl children at home, in the community and the school. Support to the girl child will have to flow following the life of the girl children over a sustained period of time and transforming the events that surround their lives. Several programmes have been launched including the more recent 'beti bachao, beti padhao' programme. Yet it is necessary to formulate a more comprehensive policy for girls education that goes beyond the school years and shift the focus from mere parity to gender equality. The policy should also address the needs of reorienting the youth in order to socially impact their attitudes as they grow. The policy should also address the education of young men and women who enter colleges and universities who would eventually shape the societal values and orientations.

ICT and School Education

The tremendous potential of ICT in recasting the quality of school education experiences is widely debated and discussed. However, policies and programmes that effectively transform the school experiences of the young learner need greater attention. We have to move beyond the current paradigm of supplying hardware and proprietary software to schools and embed ICT into all aspects of school life. It should be recognized that ICT is already part of every growing child; withholding its use in schools in an integrated fashion only creates alienation of school from the larger life space of the student. Further as a UNESCO report entitled 'Our Creative Diversity' points out, exclusion from technology places those concerned at a disadvantage in the coming "information society." It creates an ever larger rift between high society, between high technology and the modernization of the elite on the one hand, and the marginalization of the majority of the population on the other. The swift pace of high-tech advances drives another wedge between youngsters. The haves will be able to communicate around the globe. The have-nots will be consigned to the rural backwater of the information society.

Learning Achievement to be the Primary Focus

Learning is at the centre of all educational processes. Parents send their children, after all, expecting them to master reading and writing and acquire knowledge. It is difficult to condone poor performance of schools on this count. Poor learning levels act doubly against the interest of the marginalised groups. However, it is misleading to treat school quality as synonymous with pass percentages in public examination or placement in national league tables based on national testing. If quality with equity overcoming the problems of exclusion

and discrimination is the concern, definition of school quality cannot be based on marks and grades alone which often hide underlying inequalities. Two broad sets of factors that cause inequity in quality have to be recognized and dealt with, namely, inequality of provision of quality schools and secondly inequitable practices and discrimination *within* schools.

Further, experience as well as research findings indicate that macro level reform processes can improve school quality only to a limited extent. The focus has to shift to individual schools and local level action. The focus of national programme recently launched under the banner of 'Shaala siddhi' paves the way for formulating a comprehensive national policy in this regard adopting 'school improvement planning' as a core strategy for building local capability for institutional development as we well as to inject a sense of ownership and accountability to school functioning. Another strategy adopted in this regard to is to develop leadership capability from within the school for meaningful transformation. Policies of school governance have to engage with building leaders for schools of the future embedding new knowledge and skills necessary for sustainable development.

Refocusing the Curriculum Debate

Curriculum is critical determining the quality of education imparted. There has been considerable attention paid during recent years to revamping the school curriculum. However, the discourse has remained truncated as the focus has been mainly on the representation of events and personalities in the social science and history textbooks. This narrow concern has to give way to a more comprehensive policy engagement in determining the contours and contents of the school curriculum. In particular, the focus has to encompass science education effectively as no country can develop without the supply of well equipped professionals in science and engineering. In fact, an emerging trend observed across the world is to create special pathways for bright and interested children to pursue science and mathematics through specially designated institutions commonly addressed as STEM (Science, Technology, Engineering and Mathematics) schools. Unfortunately, science education has received highly inadequate attention over the years: often, one comes across instances where science and mathematics are taught by teachers without professional qualification in science. The Right to Education Act mandates appointment of specialised teachers at the upper primary classes. But, this may remain only a cherished goal if corrective measures are not taken through policies making science learning attractive at all levels and tracking children towards science at early stage with special schooling provisions. It is important to get the best scientific minds in the country to engage with budding science students exposing them to frontier areas of knowledge and research. This could possibly begin by involving our top science and technology institutions such as IITs and IISERs and the scientific research laboratories by establishing special schools attached to these institutions or in their neighbourhood in order to facilitate participation of senior professionals from these institutions imparting science education at the school level.

Engaging the Civil Society and Private Sector: New Framework

The last two decades have witnessed emergence of a number of non-governmental organizations actively engaged in school education. Generally, these organizations work closely with the community and respond to the ground reality. They have indeed become strong voices in favour of education of the marginalised groups. During the same period, corporate sector has also begun to show significant interest in promotion of school education. This is in contrast to the traditional approach in which public schooling catering to the needs of the poor has been the exclusive responsibility of the Government. Generally, the efforts by the three stakeholders, namely, the Government, NGOs and Private entities have been viewed as three distinct compartments. It is time that a comprehensive policy is framed to find common ground and propose a framework in which the Government, the NGOs and the private schools occupy common public space of education in a mutually supportive fashion and not occupy exclusive domains that divide. Obviously, the State has to play a significant role in this as market forces may not be sensitive to diversity and equality nor to the concerns of sustainability.

Conclusion

Crafting a new policy for a country as varied as India is indeed a difficult proposition. The 'rights perspective' as enunciated in the RTE Act set the tone for moving ahead in this difficult endeavour. Implementing the principle of equal rights requires shared experiences and the narrowing of the range of inequalities. It is necessary to think about the kinds of institutions that facilitate or hinder these goals. Continued inability to overcome gross inequalities would lead to an incomprehensibly wide range of experiences and interests in the society. A society in which the range of inequality is so extensive is one in which members share little. They cannot understand the claims and grievances of one another and they fear that recognizing the claims of those who are much different will come at their own expense. The new education policy has to envision a new world of values and ethics of learning to learn and live together. If such a policy has to be substantive and not merely rhetorical it must be based on shared values and experiences of people living in this vastly diverse cultural, linguistic, and economic context. There is, in fact, unprecedented groundswell in favour of education throughout the country that raises a sense of optimism for the future. The policy of the future has to be built on this sense hope and aspiration. ❑

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Financing Education

Jandhyala B G Tilak

...at least a 10-20 year national plan of funding of education that corresponds to a long term perspective plan of education development in the country needs to be developed, based on sound principles of financing of education, such as adequacy, equity and efficiency. Such a plan should assure the education system at all levels a steady flow of funds for a 10-20 year period, with sufficient provisions for rewards and punitive action

The first National Policy on Education was formulated in 1968, 18 years after development planning in the newly independent India was launched. It is exactly after 18 years, the second National Policy on Education was formulated in 1986 and was marginally revised in 1992. During the last few years, the need for a new National Policy on Education has been increasingly felt, given the significantly changing landscape in all spheres of development in general and in education sector in particular. During the last couple of decades, in the absence of any new policy, changes in education sector were introduced with executive orders and uncoordinated initiatives. The new government immediately after coming to power has indicated that it would come up with a new National Policy on Education. In this overall context, a few policy issues relating to financing of education need to be carefully examined. After all, it is widely acknowledged that finances not only play an important role, but also are clearly indicative of government's priority in favour of a given sector.

Education is widely acknowledged as an important public good, and as a social responsibility. The benefits it produces to the society are diverse, widespread over several spheres of development, and flowing for a long period, including generations after generations. Because of its direct relationship with development, and more importantly, the externalities it produces, state funding of education has been the most dominant method of financing education in most developing and advanced societies of the world. Historical evidence as well as contemporary experience supports such a view. UNESCO argues for treating education as a 'common' good, going beyond the framework of public good. Public funding of education protects and nurtures public good character of education, ensures equitable expansion of education, and has a huge potential to serve the national development needs, promoting common interests of all the citizens, as a common good.

It is necessary that the state makes a firm commitment to generous funding of education. It has been repeatedly reiterated that we spend at least six per cent of GDP on education, as resolved in the 1968 National Policy on Education. While there is need to revisit the goal, this may be viewed as a minimum target for the immediate future. The resources need to flow out of general and specific tax (e.g., education cess) and non-tax revenues of the government (at central and state levels). Presently, less than or about four per cent of GDP is allocated to education. Both states and the union government should seriously feel the responsibility of reaching the target of six per cent of GDP to education.

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There should be a proper and a clearly defined pattern of sharing of responsibilities in funding education between the union (central) and state governments. While the central government has increased its allocations to education in the recent years, many state governments are not able to substantially increase their allocations to education.

Education sector needs to be adequately funded, keeping in view the goals relating to expansion (quantitative targets like universal elementary and secondary education, and 30 per cent gross enrolment ratio in higher education), development of technical, vocational and other skills among youth, improvement in access of the weaker sections to education, improvement in levels of learning to acceptable levels in school education and in promoting high standards and excellence in higher education. Before expanding further, the secondary and higher education system with new schools, universities and colleges, it is necessary to ensure that the existing institutions are reasonably well developed and are put on sound resource base in terms of not only financial resources, but also in terms of physical and human resources. To promote quality and standards in education, substantial resources need to be allocated to teacher training, teaching-learning material including traditional as well as modern technology based equipment, libraries, laboratories, and quality research in universities and other institutions of higher education. Reasonable proportions of the budgetary allocations to higher education need to be committed to research and also to scholarships to promote equity and merit. Flow of funds to the educational institutions need to respond to the varying needs of various institutions, fulfilling the basic needs on the one hand and rewarding performance of the institutions on the other at the same time.

Since education, including higher education of the richest sections of the society produces a wide set of social benefits to the whole society, there is no justification to argue in favour of significantly relying on student fees or student loans, particularly in higher education. Earlier committees constituted by the UGC and the All-India Council for Technical Education have suggested to allow these institutions to generate about 20 per cent of the budget requirements through student fee and other sources. A Committee of the Central Advisory Board for Education (2005) has suggested that this 20 per cent may be seen as an upper limit so that equity considerations of higher education are not traded off. In case of school education, the Right to Education Act requires that elementary education is provided completely and truly free to all, providing no place for fees at all in public schools. Favourable arguments exist for extension of the Right to Education Act to secondary (and senior secondary) education on the same lines.

To promote quality and standards in education, substantial resources need to be allocated to teacher training, teaching-learning material including traditional as well as modern technology based equipment, libraries, laboratories, and quality research in universities and other institutions of higher education. Reasonable proportions of the budgetary allocations to higher education need to be committed to research and also to scholarships to promote equity and merit.

Strong universal and high quality education systems are developed in advanced regions of the world with the funding exclusively by the state in case of school education, and in case of higher education, with heavy public funding, supplemented by liberal funding by the society at large, specifically through philanthropic donations and endowments from the corporate sector and individuals, including alumni. Student contributions in terms of fees even in higher education in these societies constitute relatively a minor source of funds. It is necessary to develop a framework in India that promotes the missing source of funds – the non-state and non-student sector, namely philanthropic sector. Besides, linking some of the provisions of the Corporate Social Responsibility Act specifically to education sector, innovative measures to promote individual and corporate donations and endowments to education need to be searched for. It is also necessary to see that non-philanthropic and profit-seeking private sector is not promoted in education by the state, as education in such institutions, even if good in terms of narrowly defined parameters of quality, might not help in building nations with values. Similarly, one has to be very cautious with respect to application of public-private partnership models in education. Such models might work well in case of infrastructure and other sectors, but may not necessarily work satisfactorily in case of education, given the specific nature, characteristic features and functions of education. To sum up, given the historical and contemporary experience of many advanced countries, it has to be noted that the state has to play an increasingly dominant role in financing education at all levels, and there is some scope to raise resources from other sources such as alumni, internal sources, philanthropy, etc., but there are limits for raising and relying on resources from non-state sources and that they can and will only be supplementary, need to be recognized.

Lastly, at least a 10-20 year national plan of funding of education that corresponds to a long term perspective plan of education development in the country needs to be developed, based on sound principles of financing of education, such as adequacy, equity and efficiency. Such a plan should assure the education system at all levels a steady flow of funds for a 10-20 year period, with sufficient provisions for rewards and punitive action. ❑

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Technology in Education: Hopes and Aspirations of a Fidgety Generation

Rajaram S Sharma

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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National Digital Library: Building a National Asset

Team NDL, IIT Kharagpur

NDL will open several opportunities for new-age techniques in learning, solve many of the long-standing bottlenecks in education and research, facilitate systematic crowd-sourcing in education, and become a true national asset

The concept of Library is undergoing a paradigm shift as more and more contents are made available in electronic form and *Information and Communication Technology* (ICT) tools and services facilitate easy discovery and location independent access of library resources. There have been many digital library initiatives in the world including in India. In India, the digital library initiatives have been sponsored by several Ministries, notably Ministry of Human Resource Development (MHRD) under its National Mission on Education through Information and Communication Technology (NMEICT) Mission. In spite of several such initiatives in the country, most of the challenges faced by students, teachers, and general users in using digital contents remain unaddressed to a large extent. Users still have to visit individual websites to access e-resources, need to learn retrieval / search techniques separately, face the lack of vernacular access and limited contents. Further, there is hardly any integration of learner-learner, teacher-teacher and teacher-learner communication within the learning environment.

In this background, MHRD initiated the *National Digital Library* (NDL) pilot project under NMEICT in April 2015 to address the above issues and bridge the gaps that exist in the wide range from literacy to advanced knowledge discovery and development of knowledge. It will enable integrated knowledge gathering on diverse topics in various sectors including economic, technical, strategic, and social sectors and will help personalized, self-paced, new-age multi-media education at all levels. To avoid duplication, NDL will not be a new Library, but will be a deftly crafted umbrella over the existing ones.

Besides being a huge pan-India repository of knowledge, NDL is envisaged as a platform that will bring fundamental shift in the paradigm of education and research. It will help students to prepare for entrance and competitive examinations. It will enable people to learn and prepare from best practices from all over the world and adopt them. It will help researchers to perform inter-linked exploration from multiple sources and carry out new analytics of text, audio, image, and video data to create new knowledge. Finally, it will support the continual evolution of new pedagogy of learning and new opportunities to leverage ICT in education.

The NDL Project is led by Dr. Partha Pratim Das and Dr. Partha Pratim Chakrabarti, Director, IIT Kharagpur. The Team NDL comprises Dr. Plaban Bhowmick, Dr. Sudeshna Sarkar, Dr. Arobinda Gupta, Dr. Sandip Chakraborty, Dr. B. Sutradhar, Dr. Subrata Chattopadhyay, Mr. Mainak Ghosh, Dr. Anupam Basu, and Mr. Nanda Gopal Chattopadhyay.

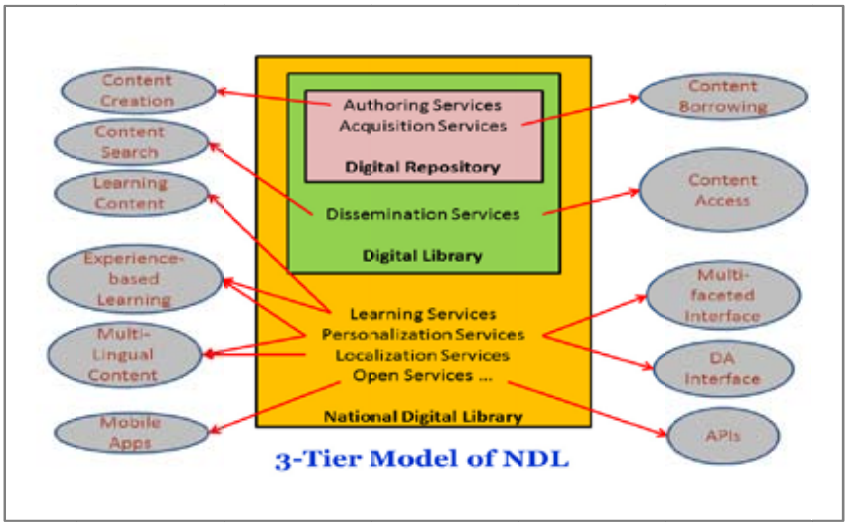
During this pilot project, NDL will devise a framework suitable for future scale up with respect to content, volume and diversity to become a full-blown National Digital Library of India over time. It is being developed at IIT Kharagpur through the creation of a 24X7 enabled infrastructure with a single window search facility that comprises hardware systems, networks, software tools and applications. It will collate e-contents for students of school, college and higher education by sourcing from multiple entities including harvesting of *Institutional Digital Repositories* (IDR) across institutions of the nation, crawling of websites of global educational portals, collection of metadata of e-contents created under various national initiatives, and metadata provided by national and international publishers. The project will facilitate institutes to disseminate existing e-contents through setting up of IDRs. It will provide support for immersive e-learning environments at multiple layers spanning across all academic levels, all disciplines and all languages and will support interfaces in vernacular and for the differently-abled users. In its final contour, the system will serve as a pan-India virtual teaching-learning-evaluation-knowledge discovery and innovation platform, a key national asset.It will also encourage entrepreneurial development of tools around this platform.

Model of NDL

The overall model of NDL has been conceptualized over digital repository systems in a 3-tiered manner (Figure 1) where services are added in each tier. The bottom-tier (*Digital Repository* or DR) will cater to basic Authoring and Acquisition Services through content creation and borrowing. The middle-tier (*Digital Library* or DL) will provide Dissemination Services through content search and access. Finally, the top-tier (*National Digital Library* or NDL) will support a number of value-added services like Learning, Personalization, and Localization whose combination would provide a set of rich experiences to the user. These will include Experience-based Learning, Multi-lingual Content Browse & Search, and Multi-faceted Interface. NDL tier will also support Open services through which others will be able to build new extensions to it in future – a Mobile App for NDL being an immediate possibility.

Structurally, NDL will be heavily distributed. Its bottom-tier (DR), that would actually carry the content, will not be centralized at IIT Kharagpur. Rather, every owner / provider of content would carry it in their respective DR (a DR could be an IDR support by DSpace or ePrint or a website or the like) which will be accessible through a URL. DRs will also have a separate (possibly private) connection to NDL servers through which a DR will provide the metadata of every content to NDL for indexing and search. This will be managed in the DL tier. When a user would look for content, the same will be searched based on the metadata and presented in a list to the user. When the user would want to access the full-text of a content so listed, she will be redirected to the URL of the content for actual access to happen from the respective DR. Consequently, the terms and procedure for full-text access will depend on the content, the owner / provider of the content, the user, and their mutual relationship. This would relegate the issue of copyright to the provider and the consumer, keeping NDL out of its purview. Finally the NDL tier will build the set of value-added services based on the metadata index sets, intelligent graphic interfaces, usage analytics, etc.

Figure 1: 3-Tier Model of NDL



Design Goals of NDL

To meet the stated objectives and guided by the model outlined above, we have identified a set of goals for the design of NDL. The goals are identified based on the feasibility of the pilot phase and the later extensibility for the full scale version. The goals are briefly presented in this section.

Stakeholders

The stakeholders of NDL include students, teachers, general users, authors, publishers, cataloguing service providers, contributing institutions (those who maintain DRs and allow the integration of their contents in NDL), consumer institutions (those who use NDL),

Figure 2: Use-Cases of NDL

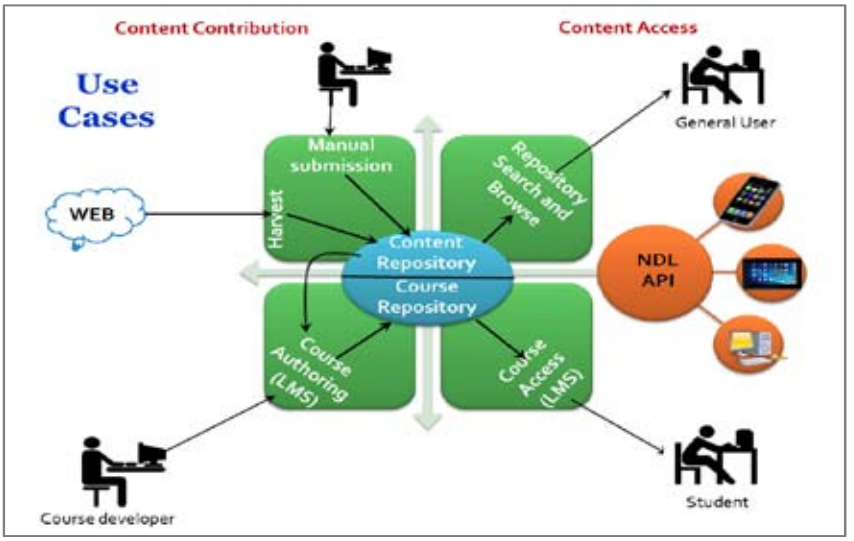
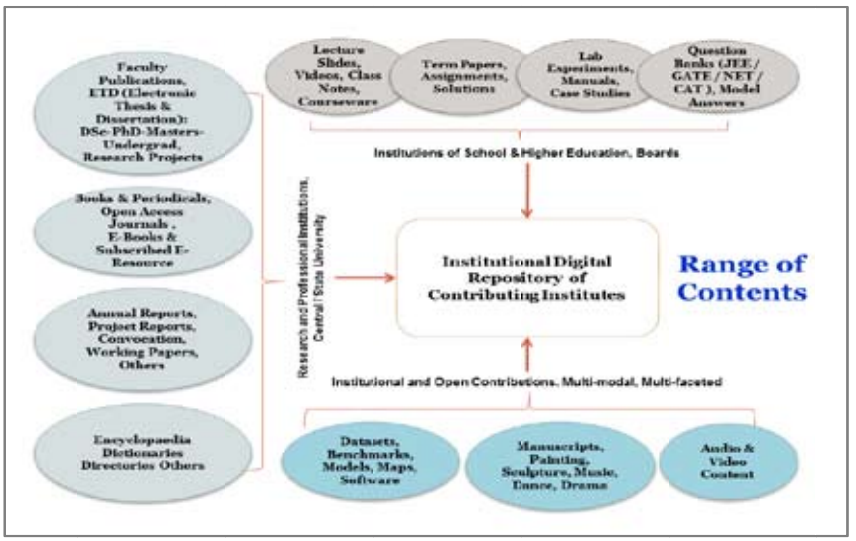


Figure 3: Range of Contents in NDL



ministry, and Government.It should serve users at all stages from Kindergarten to cutting edge research to life-long learners.

Use Cases

The use cases of NDL are illustrated in Figure 2.

As may be noted from the diagram, the repository has two major components: Content Repository and Course Repository. Contents may be ingested in the Content Repository through Harvesting (including Website Crawling) or through manual entry. In Course Repository, courses are created and submitted by Course Developers as a part of the Learning Management System (LMS). Consumers such as general users and students are the users who access these repositories.

Content, Metadata and Standard

To be useful to all kinds of learners, NDL is being structured to cover all domains of knowledge, all types of learning contents – not just books and journals, but also video/ audio material, software, animations, simulations, web-courses, hands-on, lab materials, question banks, model answers, etc. Figure 3 gives a representative view of the content coverage of NDL.

The domains will cover Science and Engineering, Medical, Law, Culture and Heritage, Humanities and Arts as well as Sports. It is designed for open access and shall accept relevant contents from all kinds of contributors be in the Public sector or Private sector.

Metadata is the data that represents contents. What data will be captured in the metadata depend on the nature of the content as well as how conveniently and precisely, the wide gamut of users will be able to discover the contents. Metadata, therefore, is at the heart of any digital library and

Figure 4: NDL Metadata Standard

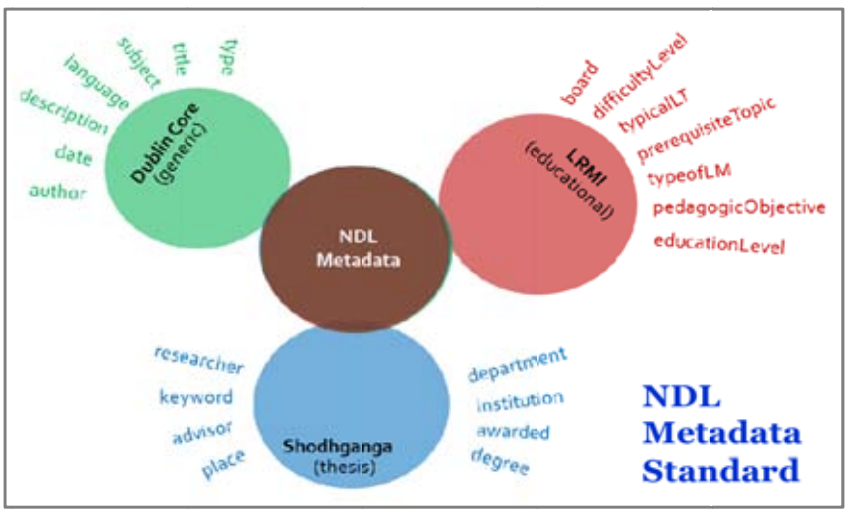
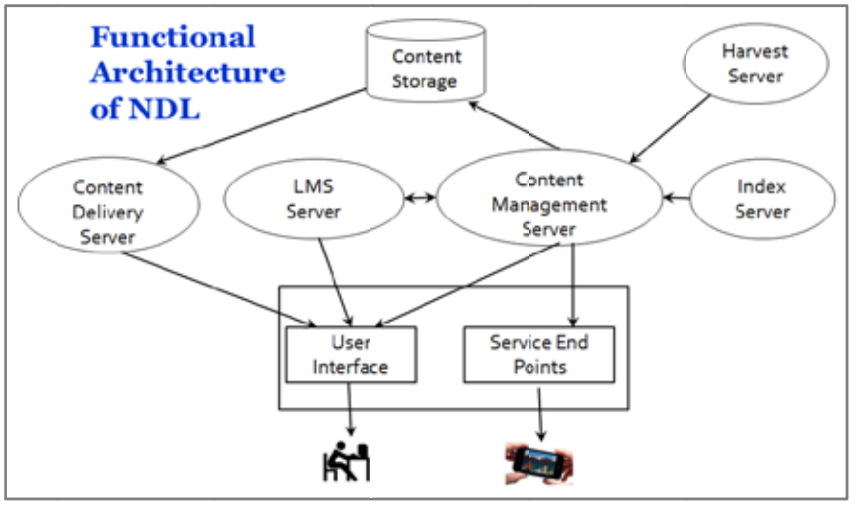


Figure 5: Functional Architecture for NDL



hence, judicious design of metadata standard is of paramount importance in building a digital library. Quite a few metadata standards, both of national and international origin, such as Dublin Core, IEEE-LOM, MARC, Shodhganga exist. However, not a single one can optimally handle the requirements of NDL. Instead of venturing into creating yet another standard, NDL decided, after lot of deliberations of experts of the field, to adopt an Open Virtual Standard as summarized in Figure 4.

In this approach, the origin of each element of the metadata is identified by retaining the domain name of the adopted standard (such as "dc" for Dublin Core in case of Generic metadata elements, "lrmi" for Learning Resource Metadata Initiative in case of Educational metadata elements). The standard is also flexible thus, ensuring that metadata elements can be appended in future to address nature of contents or learners' requirement that have not been envisaged at this stage.

Functional and Hardware Architecture

The functional of NDL is shown in Figure 5.Contents are harvested through Harvesting Server, stored in the Content Storage and indexed in the Index Server. These are delivered to the users through Content Delivery Server and LMS Server. All these are controlled by Content Management Server. Service end points, through Application Programming Interface (API), are provided for a host of user devices like mobile, tablet and value-added service providers.

Based on the functional architecture, the IT infrastructure of NDL comprising various servers, storage and network is outlined in Figure 6.

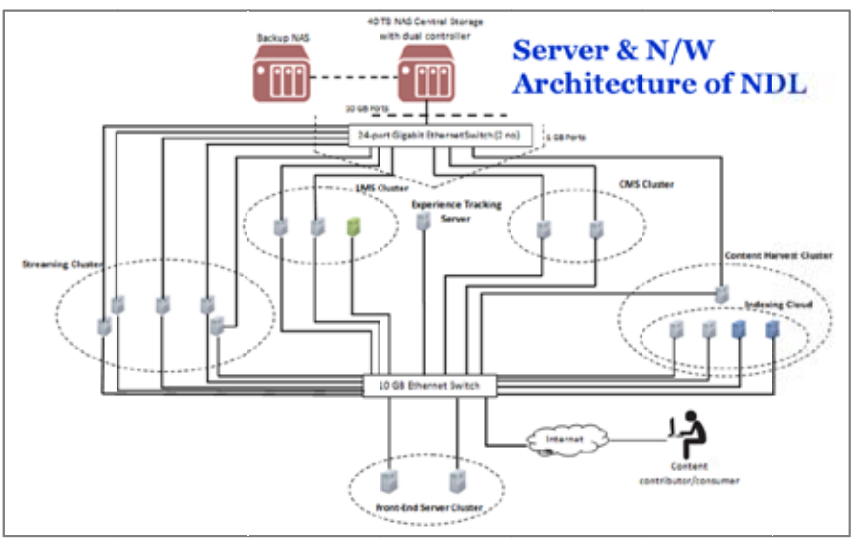
Automation and Technology

Extensive use of state-of-the-art technology only can ensure a user-friendly, responsive, efficient and ever-expanding digital library, building it in an optimum time frame and making it properly maintainable. Each area involved in building the digital library starting with harvesting/crawling, multi-lingual support, integration of repositories and federated searching, interface for differently abled users and extending to IT infrastructure to address aspects like disaster recovery is a candidate for technology adoption. Metadata annotation/curation are humongous tasks in building a digital library and manual annotation/curation in massive scale is impractical. Machine Learning, Natural Language Processing and Image Processing algorithms to extract smart information from contents are being used in this respect.

Copyright Protection

Copyright protection is a prerequisite of any such national initiative. Since it is a complex and sensitive issue, NDL has adopted the approach of acquiring and storing only metadata, which is copyright free, but not the full-text content, unless it is voluntarily contributed by a contributor. As part of NDL search result, user will get a link of the content source clicking which the user may get access to the full-text content depending on the policy of the

Figure 6: Server and Network Architecture of NDL



source organization. In this approach, user may access full-text content of restricted or paid contents based on bipartite understanding between the user and the source organization. Efforts, however, are underway to make sizeable section of school as well as research level contents, including those in vernacular, available for free access with the help of MHRD, UGC, school boards, and several other agencies.

Inclusiveness and Openness

The philosophy of NDL is inclusive and open – inclusive of all levels of users of all kinds, all areas, all languages, all domains, all sources, and all types of contents. It is envisaged to be open in terms of usage. The infrastructure and metadata of NDL will be open for all kinds of research, development, and extension except for copyright restrictions on full-text wherever applicable.

Awareness and Dissemination

Workshops and conferences are being conducted in various regions of the country to build awareness and provide hands-on training. Delegations from NDL are actively presenting the NDL in various national and international conferences to ensure dissemination. A website (http://www.ndlproject.iitkgp.ac.in/ndl/) has been set up where information on NDL is freely available.

Conclusion

The full scale NDL will be able to bring a paradigm shift ushering in a new education movement in the country covering all stages from kindergarten to cutting edge research to life-long learners. Not only will this provide wide range of contents as described in this paper, NDL will open several opportunities for new-age techniques in learning, solve many of the long-standing bottlenecks in education and research, facilitate systematic crowd-sourcing in education, and become a true national asset.

There are, however, a few challenges which need to be addressed in due course to make NDL self-sustainable. Some of these are Effective Crowd-Sourcing Mechanism for contents, National Licensing, Clean Copyright Policies, Creation of High Value Proposition, Self-Supporting Revenue Model and Inculcation of Open Culture at large. It is expected that with the development of awareness and effective support of various Ministries and citizens of the country, it will be possible to address these sooner or later thus, making NDL the national learning platform in India. ❑

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Towards a Value-based Society: Learning to Live Together

J S Rajput

"Man has no chance of survival if knowledge only remains knowledge but if we could transform knowledge in to wisdom, he would not only survive but will be able to ascend to greater and greater heights of achievements"

GB Shaw

...through sincere initiatives and efforts, people are educated and persuaded to lead a life based on these indications, the dimensions of work culture in places of work; as also the climate in educational institutions would stand transformed. Let every person, every professional, every parent realize his role in transforming India

Amongst all living beings, only humans are blessed with the unique, instinctive and lifelong urge to explore, visualize, concretize, develop, create, refine, utilize and persist with further efforts to improve towards better life and more knowledge and wisdom. As the human civilizations grew, the need to transfer the experiences gained and knowledge acquired to generations ahead became an obvious responsibility. Accordingly, ways and means were found in every civilization to 'educate' their young. It may appear a bit complex to visualize how great scriptures were passed on from one to another in perfection already achieved; only through oral learning traditions, without any paper and pencil support! At the present juncture of history, the process of dissemination, creation, generation, augmentation and utilization of knowledge is subsumed under education and research. It stands strengthened through interactions, exchange, technical support and information technology refinements that, again, are outcomes of persistent human ingenuity and initiatives. Even fifty years ago, the present shape of an I- pad or laptop computer appeared a utopian dream to most of the people. Whatever benefits and advantages that emerge out of accumulated knowledge, understanding and wisdom, humankind is blessed with, at present, is an outcome of sustained efforts of devoted and dedicated human beings who had the human welfare as the prime goal of their life. As the knowledge base grew gradually in different places and circumstances and human mobility increased, the universality of knowledge gained was realized, acknowledged and utilized to enhance the pace of strengthening it further. Today, human beings understand the forces of nature; they know how to utilize the treasure trove that the Mother Earth has in its possession for the betterment of human life. They also realize that all human beings have common and shared future. To sustain, and make it better for generations ahead, they also realize the value of sharing and caring that emerges instinctively from the eternal unity of human beings: *World is but one Family*!

History also reveals that knowledge gained has also been utilized to feed and foster negativity. As man moved across continents, it resulted

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in colonialism, slavery, apartheid and such other inhuman tendencies. When the man gained knowledge of atomic power, he also created the tragedy of Hiroshima and Nagasaki. Today, he suffers fundamentalism, terrorism and the fear of Cyber attacks! Human beings have indulged in wanton exploitation of global natural resources in full knowledge that natural resources are limited and there is no other planet other than this one to sustain human life. When greed takes over human conscience, violence finds the most fertile climate and space to flourish, wars follow and wanton destruction of human and natural resources become the order of the day. Never before had human beings so mercilessly disrupted the sensitive man-nature link as at present. Even for a layman, the dying rivers, polluted air and contaminated water tell the entire story. Great advances in the area of heath preservation and medicines just appear inadequate to match the health hazards that man has himself generated through its wanton indulgence materialistic pursuits, totally ignoring the obvious disastrous consequences that may follow. Today, scientifically-sound estimates are being made on 'how long shall the planet earth survive if corrective measures are not initiated sincerely and honestly? The malady is known, the medicine is also known, but the glamour and glitz to acquire more and possess more prevents nations and their leaders in implementing strategies that would prevent disasters that are looming large before all, threatening the very survival of the planet earth. What has gone missing amongst leaders and people? Why are human beings bent upon ruining their own habitat, killing their own brethren and making the world insecure and unworthy of a peaceful, dignified and decent life for all of the human beings? The search for the answer could also be levelled eternal! *Vedas* did it much earlier. For those unfamiliar with the Vedanta, it would be worthwhile to recall Plato. In his 'Republic', Plato wants his audience to understand that 'a good life consists in being a certain sort of a person rather than merely doing certain sorts of action'. To Plato, the answer lies in moving from 'What should I do' to 'What sort of a person should I be'? And here comes the teacher, and education. The teacher transforms a lay innocent individual into a personality. The teacher takes him from humanity to divinity. If that objective is achieved, the values of truth, non-violence and peace would be visible all around! Love and brotherhood would follow and love would no longer remain an invisible aspiration. That would be the strength of education that inculcates values through the teacher who knows his role as a role model on one hand and as a nation builder on the other. He moves far ahead of being a mere curriculum transactor.

And who is not talking of 'value erosion' that comprehensively illustrates all the harm that human beings, in their full knowledge and understanding, are inflicting upon themselves. Human ingenuity must find out a way out. The only way out is to go to education - schools, colleges and institutions of higher learning - and put in prime focus value inculcation, nurturance and development.

Materialistic global trends impact, to varied degrees, everyone and that includes teachers and the system of education also. Education shall always remain the ray of hope for mankind. Knowledge and its pursuit are necessary but that alone is not sufficient. Wisdom and '*vivek'* are essential ingredients to let the human race survive. Not that there were no warnings on the count; we simply ignore them! When Mahatma Gandhi said that nature has sufficient to meet the needs of everyone; but not the greed of anyone, he, in fact, summarized the entire future of human race in these words. It comprehends the sensitivity and mutuality of the man-nature relationship and contains a warning that exploitation of natural resources must end. When *aparigrah*: non accumulation, grew in Indian philosophy, it was both a warning and a value that needed to be heard and heeded. Today, we learn about global concerns being expressed in the meetings like Earth Summit, Climate Summit, and others at regular intervals. Not much effective action emerges out of it. And who is not talking of 'value erosion' that comprehensively illustrates all the harm that human beings, in their full knowledge and understanding, are inflicting upon themselves. Human ingenuity must find out a way out. The only way out is to go to education - schools, colleges and institutions of higher learning - and put in prime focus value inculcation, nurturance and development.

In Indian tradition, much before other civilizations entered that area, the learned and knowledgeable strived to understand not only the life on this planet but also what happens after one's final departure from this planet! In this quest, they explored, in their own way, the very objectives of creation. That led to development of the philosophy and practice of spirituality. The entire world acknowledged it. The spiritual quest led to better understanding of the mundane life as well. The values of right conduct, concern for others, eternal human unity, peace in life and with others emerged and their significance duly realized. Indian scriptures elaborate how and why the man- nature relationship must be maintained in all of its sensitivity. These also assign this responsibility to human beings, as they are bestowed with capacity to think, envision, plan and whenever necessary, devise new strategies as corrective measures. The widely known Delores Commission Report (UNESCO, 1996) that presented a vision of education in the 21st century identified seven tensions that human beings are facing at present:

- Global and the local;
- Universal and the individual;
- Tradition and modernity;
- Long term and short-term considerations;

- Competition and equality of opportunity;
- Knowledge explosion and capacity to assimilate; and
- Spiritual and material;

The consequences of these tensions are now not only obvious to one and all on the planet earth, this calls for immediate corrective initiatives in several areas. On one hand is the issue of global warming; and on the other, the present generation has also to confront increasing violence, fanaticism and terrorism. These just cannot go together with human advancement and development. Further, practically every nation is facing an economic crisis. Developing countries look towards developed countries for economic aid, support in techniques and technological advancements and in various other sectors. Such inputs do not come for free and often result in a crisis of ideology of progress that may suit a particular country but not the other. All this leads to the visible presence of 'some sort of a moral crisis' that every nation is facing at present.

Preparing a 'Humane' Person

Every civilization and every religion has evolved its own traditions, norms, practices that bind people together in their practices of life and living; and also norms of behavior and human socialization. Everywhere, it can safely be stated, people are followers of one religion or the other. With increased mobility, communities are developing fast in which followers of different religions and cultures have to live together and work together. The diversity of culture, religions and languages or nationality is no impediment to human advancement if the essential unity, and equality, of the humankind is realized, and internalized by one and all. This happens most effectively during the process of growing up of the child and the process of acquisition of education and learning of the young.

How does a country decide upon the model of education that it implements? It is now widely accepted that education of every nation must be rooted to its culture and committed to progress. It is India's own experience that transplanted structures of education just cannot flourish on alien lands. After independence, India decided to persist with the model of education that was meant for preparing manpower to assist the alien rulers in the lower rungs of the system of governance. It was not meant for all, it was not concerned with the culture, history and the Indian tradition of knowledge pursuit. While there are certain eternal human values, the cultures and traditions have their specific connotations that provide strength and motivation to its people. These spread the sense of beauty that diversity offers to all across continents, religions and regions. Hence, these have to be preserved and strengthened through mutual interactions and the process of expansion, strengthening and refinement. For all this and a better and more fulfilling human life, the prime force is the process of education in the current times. The objectives of education, in whatever manner these are articulated, finally lead to one comprehensive statement; it has to be man- making education! When Swami Vivekananda states that 'education is the manifestation of perfection already in man', he is putting the totality of human life, its goals, objectives, process and product in a couple of words that even the great treatises may not communicate! Rabindranath Tagore presents his comprehension of education as a relationship of man and nature: "The highest education is that which does not merely give us information but makes our life in harmony with all existence." In 1909 Mahatma Gandhi wrote 'Hind Swaraj, and in that, he quoted the definition of education which, it would be seen also comes essentially to man-making: "That man I think has had a liberal education who has been so trained in youth that his body is the ready servant of his will and does with ease and pleasure all the work that as a mechanism it is capable of; whose intellect is a clear, cold, logic engine with all its parts of equal strength and in smooth working order... whose mind is stored with a knowledge of the fundamental truths of nature... whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience... who has learnt to hate all vileness and to respect others as himself. Such a one and no other, I conceive, has had a liberal education, for he is in harmony with nature. He will make the best of her and she of him." The search for such an education continues worldwide and that in itself is a very encouraging sign of civilization growth and evolution. Huxley indicates what could be the output of excellence in education: "The well-developed, well integrated personality is the highest product of evolution, the fullest realization we know of in this world." He goes on further to emphasize; "The exploration of human nature and its possibilities has scarcely begun. A vast new world of unchartered possibilities awaits its Columbus." Dr. Radhakrishnan put it in words that comprehend education in its totality: "The end-product of education should be a free creative man who can battle against historical circumstances and adversities of nature." In the current terminology that emerges out of the globalization, enhanced connectivity, cultural interactions and economic interdependence, one may state that only those who enhance their cognitive capital shall rally move ahead in a world that, at present, is not so conscious of the importance of 'cognitive capital' and is focused only on generation of financial resources, often over-exploiting what nature has to offer to

The Twin-Tower-Tragedy of 2001 revealed that young boys and girls from sixty nationalities were working together in those two buildings. Their ethnic, cultural, linguistic and social upbringings were far varied but they had learnt how the world of tomorrow shall take shape and how people have to learn to strive together to move on the path of progress and development.

mankind. It is this blind pursuit and exploitation that has resulted in natural calamities in Uttarakhand, and have inflicted huge hardships on Mumbai and Chennai. The air that the residents and visitors to Delhi breath is dangerous and most injurious to children but the increase in polluting it further continues unchecked. It is the value-less development that has practically killed natural water reservoirs, rivers and has not spared even the most revered of rivers on the planet Earth mother Ganges! Does it not speak volumes on the erosion of values that is now threatening the very survival of the human race? The irony of the situation is that all this is happening when the world, and India, boast of enhanced literacy rates and great achievements in the universalization of elementary education. The situation warrants urgent remedial steps to let education achieve its objectives in totality. Nelson Mandela articulated it very comprehensively: "education is the most powerful weapon which you can use to change the world". Towards that education must bring the best out of 'body, mind and spirit'. Total personality development requires initiatives at the level of family, community and education to pave the path of growing up through thought, action and deed.

What Can be done?

The freedom struggle of India was unique in many ways, the most outstanding being the presence of Mahatma Gandhi and his firm belief in the pursuit of Truth, come what may. He summarized it all in one sentence; "My life is my Message". Through his own example and actions, he motivated crores of Indians to lead a value-based life, realized the need to serve the needy, and finally, be ready to sacrifice everything for the country and countrymen. In those days of low literacy and meager means of communication and a scanty presence of print media, one was interested in how Gandhian ideas and values could spread so fast to every nook and corner of the country! It emerged in personal interactions with those who had the privilege of participation in the freedom struggle with GandhiJi that the role of school teachers in spreading the Gandhian thoughts was indeed the most significant. They spread the use of Khadi, and that meant acquisition of the value of *aparigrah* – non accumulation. Anyone who limits his needs and requirements, shall certainly not be lured by corrupt practices that engulf only those who indulge in acquiring more, and more. A great visionary that Mahatma Gandhi was, he could see what would result in value erosion in future if necessary caution is not exercised by the systems of governance, and more importantly, by the people. In 1925, he published seven social sins in the Young India:

- Commerce without Morality
- Education without Character
- Pleasure without Conscience
- Politics without Principles
- Science without Humanity
- Wealth without Work
- Worship without Service.

These seven present the comprehensive guidelines for the planners and implementers of every country. India needs to acknowledge that unless it presents a model of value-based society in action, its dream of leading the world in spirituality shall remain a distant dream. Convert the above seven sins to 'Seven Individual Action Points; putting with instead of without; and witness the miracle! Once, through sincere initiatives and efforts, people are educated and persuaded to lead a life based on these indications, the dimensions of work culture in places of work; as also the climate in educational institutions would stand transformed. Let every person, every professional, every parent realize his role in transforming India. Just impress upon each one of them to review on daily basis: what I have done today for others; what have I done today for the community and my country; and what mistakes did I commit today that violate the path of truth? It has the potential to let people achieve their inherent potential and play a leadership role. Yes, everyone could become a role model for everyone else. It would create an environment right from home to school to workplace to lead a fulsome, creative, and contributing life. Let education accept the challenge to assist in creating an environment for the individualized action plan that aims to transform every person in to a personality.

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One Stop Shop : Farmer's Portal

The Farmers Portal along with mKisan Portal aims to serve as a One Stop Shop for all the farmers for accessing information on agricultural activities. The Portal provides information about package of practices; crop and seed varieties; common pests; dealer network for seeds, fertilizers & pesticides; machinery and tools; agro-met advisories, credit & insurance, rain-fed areas etc.

Both these Portals can easily be accessible from any part of the country free of cost by the farmers by visiting the Ministry's website. Its activities are also highlighted through short discussion/interview on "DD Kisan Channel.

A Vision for Quality Education

Kiran Bhatty

...institution building is a long drawn process that requires a clear vision and an ability to stay the course. It cannot be achieved through short-term goals, quick fixes and technological tinkering. It requires the foundations of the systems to be strengthened and enabled to allow for sustained and long term improvement. Unless we are able to make that investment, we may find yet more generations waiting on the margins of educational opportunity and development

Recent years have seen a growing concern with the quality of education being imparted in schools, especially within the government school sector. Every survey, be it the Annual State Education Report (ASER) report or the National Achievement Survey of NCERT or the international test [PISA], all have shown levels of learning, even in basic competencies of reading and math, to be much lower than what they should be. The alarming results have led to heated debates over the causes of decline in quality and possible solutions to the problems. In addition to issues related to the essentials of education, concerns about governance have also emerged as contributing factors to the declining quality of schools and education. Questions have even been posed about the credibility of testing methods, the validity of quantifying learning, the nature of assessment indicators used and so on. However, in the absence of adequate research-based evidence, sharp lines have been drawn between the proponents of different approaches with no signs of a consensus emerging.

In the midst of the heated discussions, there is a real danger of getting distracted from the core vision for education to the detriment of all – education, the children, and the nation. Are we losing sight of the broader vision, in the rush to find 'solutions' ? Are we willing to cut corners and neglect essential processes in order to show 'results?' Are we avoiding engagement with institutional factors and circumventing them instead, to hasten the pace of achievements without worrying about their desirability or durability? Are we losing sight of the purpose of education and allowing it to be driven by concerns of the economy instead? On the eve of a New Education Policy, it is an opportune moment to step back from these contentious debates and focus on where we stand on our real vision for education. Three strands in the current discourse, that appear to present a threat to the larger goals and vision, are discussed here.

i) Skill or Education?

Perhaps, the most fundamental element of how we perceive education lies in the distinction often made in academic and policy discourse between the "instrumental" and the "intrinsic" value of education [Dreze and Sen, 1996]. The former refers to education as a means to improve opportunities for social and economic mobility measured

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largely in terms of employment and income growth, whereas the latter refers to improvement in the quality of life of an individual going far beyond the quantifiable benefits that education provides. While there is little argument over both being important, recent years have seen far too much attention paid to the instrumental values, especially for the poor who tend to swell the ranks of government schools, and much less attention to the intrinsic values. In the current context, this trend has taken the shape of a focus on skill development as the driving force in school education. This thrust derives unfortunately from the objective of preparing the young for the labour market, as quickly as possible, and not from the objective of providing an opportunity to realize their full potential as individuals. Acquiring skills early in one's educational life, as is being proposed, not only takes away the opportunity to learn and grow, it also runs the danger of condemning the individual to a life of low-wage employment, based on skill development and not education. Acquiring skills for the job market is thus, a narrow and parochial view of education serving the short term interests of a few. In addition, it ignores the fact that even to acquire skills, a basic level of education is necessary. With the elementary education sector still miles away from delivering the goal of universalization, the focus on skills can thus, serve to distract from the primary goal of quality school education for all.

This is not to deny that "skills" have no place in the life of a child or in a school curriculum. They do – but they are of a different nature and play a different role. "Life- skills", for instance, have emerged as a crucial element in the learning grid of children. Other non-academic or non-cognitive skills too have an important role to play in the educational development of children. The problem emerges when policy advocates life skills for some and vocational skills for others, especially at the level of school education. In so doing, it not just contravenes the constitutional objective of equality of opportunity, widely interpreted in educational terms, but does not serve the long term objectives of the economy either.

Scientific Temper or Social Science Perspective

It has been acknowledged the world over that education is instrumental in 'nation building', through preparation of children for the roles they will play in the future development of the nation. While, the roles will undoubtedly encompass many spheres of engagement covering, even expanding the scope of current knowledge values of citizenship, especially as enshrined in the Constitution, play a foundational role in the education matrix of any individual. These values of democracy, social justice and equality, which have a far reaching impact on all spheres of adult life– personal and professional - are imparted early on through a well-developed social science curriculum. Unfortunately in the current discourse, improving education quality is being viewed through the exclusive lens of 'building a scientific temperament' with little or no discussion on inculcating values fostered by social science. The push for better teaching of science and math, while necessary, must be balanced with an equal emphasis on better methods of teaching social science. The neglect of social science as a field and as a perspective misses an important link with the core areas of thought that social science engenders – that of critical enquiry, historical review and structural analyses. These are as basic to the educational development of an individual as are the essentials of science and math. As such, the envisioning of quality education must strive to achieve a balance between both perspectives of knowledge by giving an equal push to both in the new policy framework.

The push for better teaching of science and math, while necessary, must be balanced with an equal emphasis on better methods of teaching social science. The neglect of social science as a field and as a perspective misses an important link with the core areas of thought that social science engenders – that of critical enquiry, historical review and structural analyses. These are as basic to the educational development of an individual as are the essentials of science and math.

Building Institutions or Finding Quick-fix Solutions

A large part of the failure to maintain [and improve] quality is attributed to "implementation" failures, which are in effect related to the failure of public institutions of delivery. These encompass all aspects of institutional functioning within the public education sector– from rules and norms governing procedures [recruitment, planning and monitoring] to incoherence of internal structures [intra-agency coordination, communication flow and authority structures] to broader structural relations impacting the interface of state institutions with non-state actors, as well as the dis-connect with communities. This discordance affects all institutions from the schools to the highest level of the administration, and the associated institutions in between, contributing greatly to the 'crisis' in education today. I use the word 'crisis', advisedly, knowing that it will ring alarm bells, but, knowing also that the moment for bells to toll is here, and must not be ignored. Unfortunately, instead of dealing with the dissonance, and focussing on building strong and durable institutions, the solutions being sought either pretend institutional constraints do not exist or find ways of circumventing them. The assumption for the latter usually involves a rigid view of state structures as being fundamentally given to inefficiencies and corruption. In other words, small attempt is made

to rigorously identify institutional or governance related problems that are the real bottlenecks to reform and work on altering them. Instead, the focus is on finding 'quick-fix' solutions, often based on technology without a clear understanding of the institutionlal or structural arrangements required for embedding technology. For instance, the thrust on ICT, is utterly unrealistic for large parts of the country, who are far from computer literacy or even access to computing facilities. In the schools where computers have been provided, they lie locked up – either for the fear of 'spoiling' them or for the lack of electrical power to use them. Teachers, routinely pay school electricty bills from their own pockets, as there is no line item for electricity in school budgets. Similarly, the lack of integration of teacher qualifications with recruitment rules or scope of work, is a contributing factor to low motivation levels of the teacher, which as a simple introduction of teaching-learning inputs is unlikely to impact. Thus, tinkering with the teaching methods, with a sub-set of teachers in any given school, without integrating with broader teacher education and training processes or the institutional conditions of teacher employment is unlikely to yield long term results. Even fixing accountabilities of teachers cannot be seen in isolation from accountabilities in the system as a whole, or from issues of autonomy and agency at the school level. Introducing piece-meal solutions, may in several instances even add to the dissonance, rather than reduce it.

Other institutional elements such as monitoring, planning and policy making are rarely even on the radar of conversations around education, even though they have an impact on all aspects of implementation. While decentralized planning is an avowed objective, in reality, the systems to facilitate and integrate decentralization have not been put into place. Hence, DISE formats are routinely submitted in lieu of School Development Plans and used at a higher level to devise state plans that have little inputs from local levels. The distribution of resources across districts and schools is arbitrarily done with little reference to plans or needs. Monitoring systems do not feedback into planning or policy either, as information collected by the monitors is not used by planners and policy makers. The data and information system in general, suffers from numerous infirmities related to definitions, methods of estimation, collection processes, dissemination and management. As a result, while an excessive amount of data is generated, no real time data is available. What is collected, is unavailable for use where it should be. Aligning the use of data with collection processes and disemination methods would go a long way in improving its efficacy. Further, developing templates for locally generated and managed data systems would enable decentralized monitoring, planning and implementation, allowing administrators, teachers and the communities to develop a greater sense of ownership of the schools and education systems, than they currently have.

While community engagement like decentralization, has long been an important component of the vision for education, the efforts in that direction belie the seriousness with which these objectives have been taken. As a result, they have either been 'forgotten' [like decentralization] or parallel structures of community empowerment experimented with, without dealing with the core structural constraints that impeded the functioning of the earlier structures. Hence, PTAs, MTAs, VECs, SDMCs and now SMCs have been formed, with little change in their empowerment, engagement or impact. Unless, the system gears itself to treat these elements with the emphasis they deserve, investing financial and human resources to empower and facilitate their functioning, SMCs are also likely to go the way of the other structures.

Conclusion

In the end, institution building is a long drawn process that requires a clear vision and an ability to stay through the course. It cannot be achieved through short-term goals, quick fixes and technological tinkering. It requires the foundations of the systems to be strengthened and enabled to allow for sustained and long term improvement. Unless we are able to make that investment, we may find yet more generations waiting on the margins of educational opportunity and development.

As a New Education Policy is on the anvil, the framers would do well to remind themselves of the vision that they hold for education and how the policy framework can align with the institutions of education to buttress that vision, rather than weaken it. ❑

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YOJANA WEB- EXCLUSIVES

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We are carrying the following articles under the Web-Exclusives section of Yojana for January 2016

1. Relevance of Human Rights Education in India - Kamlesh Kumar
2. Financial Inclusion Vs Payment Banks - P. Siva Rama Prasad

Please send in your comments and suggestions to us on ***yojanace@gmail.com***

Women & Girls' Education: Issues in India

Vimala Ramachandran

...the sharp divide between what is masculine and what is feminine needs to be questioned. Such an approach would help educators recognize that gendered differences between girls and boys is not a given and instead it enables them to "examine the assumptions behind it, tries to assess the disadvantage resulting form it, and develops a "different" treatment that dismantles that disadvantage

It is now well established that gender equality in education and enhancing the access of girls to basic education is influenced by three inter-locking sets of issues – systemic, content and process of education and economy, society and culture. This issue need not be reiterated now as this approach has now become an integral part of mainstream analysis.

There is almost unanimous acceptance of the fact that gender, as a category, needs to be seen within the larger social, regional and location context. India is a land of rich diversity and it is also a country of sharp disparities. The interplay of socio-economic inequalities and gender relations creates a complex web that either promotes or impedes girls' ability to go through schooling[1]. While economic disparities and social inequalities are certainly important, a number of researchers argue that cultural beliefs and practices and regional characteristics play an important role (Colclough et al, 2000[2]).

In India, it is therefore important to understand the intermeshing of poverty, social inequalities and gender relations. The three intersect in different ways in different regions of the country – with one reinforcing the other in some and offsetting one in others. Understanding and unravelling this, is the biggest challenge today[3]. In this context, there is a need to acknowledge the following:

- Rural-urban differences in enrolment, attendance and completion are greater than male-female differences;
- Backward–forward areas / regional differences are greater than gender and social group differences;
- Disparities between very poor households (below poverty line) and the top quartile is much higher than gender, social and regional differences;
- Differences between social groups – especially between tribal communities, Muslims and specific sub-groups among the SC on the one hand and the forward castes / Christians and other religions is high.
- Inter-community differences are often as severe as intra-community differences. For example, the literacy status of some tribes is better than others and some Dalit groups better than others.

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In the 1990s, most of the analysis on gender gap in education started with mapping the provision of schooling (access / supply) and the "demand" – meaning readiness of families to send their children, especially girls to school. However, with the march of years, there was a realisation that one cannot separate supply and demand for education – wherever there are schools within access and whereever these schools were regular and functioning well, their demand increased (Rekha Wazir, 2000)[4]. Conversely, where schools were dysfunctional / indifferent, where not much teaching was happening and where communities did not have confidence in the school as a safe place for their daughters, demand fell sharply. There was recognition that the availability of well functioning schools is indeed an important variable that influences household decisions (Ramachandran et al, (Snakes and Ladders) 2004, Subramanian, 2002, PROBE 1999[5]). Research on what happens inside the school and the push out factors highlighted by the attitudes and practices of teachers and of children from relatively forward social groups affects the readiness of children from socially disadvantaged social groups remaining in school (Robert Jenkins, 2005, Geetha Nambissan 1996, 2000 and 2001, Vimala Ramachandran and Taramoni Naorem 2013[6]) Experience of NGOs like MV Foundation highlighted the push out factors and over the years, there is a recognition of the need to interrogate classroom practices, teacher/administrator attitudes and prejudices and the curriculum that may reinforce social biases / discriminatory practices and gender stereotypes. (NCF Position Paper 3.2, NCERT 2005, Vimala Ramachandran, 2004).

Twenty-four years after the 1990 EFA Conference in Jomtien (Thailand), it is now recognised that the prevailing gender gap in educational achievement remains quite significant, as evident from the Table 1&2.Gender and education is not easy to unravel. Given the layers of inequalities and the growing prevalence of caste and community based mobilisation, there is a need to go beyond standard indicators of enrolment and transition and go deeper into the schooling experience of children. Tools that are used to measure gender gap / progress towards gender equality in education reveals little about the texture of inequalities inherent in the society and reinforced by the prevailing education system. Coming to grips with gender and social equity issues in education requires a framework that can capture heterogeneous gendered realities and multiple disadvantages. Gender is embedded within a complex social and institutional structure in India. Therefore, it is necessary to look at gender inequalities in education within the broader framework of social, economic and location specific inequalities on the one hand, and the prevailing school system on the other.

Table 1: Graded Inequities in Literacy rates

	Census 2001	Census 2011
Rural Female ST	32.4	46.9
Rural Female SC	37.6	52.6
All Rural Female	46.13	57.9
Rural Female Non SC/ST	50.2	61.1
Rural Male ST	57.4	66.8
Urban Female SC	57.5	68.6
Urban Female ST	59.9	70.3
Rural Male SC	53.7	72.6
All Rural Male	70.7	77.1
All Urban Female	72.86	79.1
Rural Male Non SC/ ST	74.3	79.9
Urban Female Non SC/ST	75.5	81.0
Urban Male ST	77.8	83.2
Urban Male SC	77.9	83.3
All Urban Male	86.27	88.8
Urban Male Non SC/ST	87.6	89.7

Source: Adapted by Vimala Ramachandran from Marie Lall and S SrinivasaRao 2011[7]

What Can We Do in India?

Meaningful Access

While everyone is in agreement that there is a need for more number of schools, improved infrastructure, universal enrolment and better PTR, what we miss is the granularity of the issue of actual teaching and learning happening in the classroom. Meaningful access is providing not just the physical access to participate in the formal education system, but more importantly, an equitable opportunity for all children to engage with a quality education system. Meaningful access needs to happen at every single step of the education delivery system, right from bringing the child to the school or for that matter, taking the school to a child. Right from ensuring that schools are available for all children from any social group to ensuring that once the child reaches the school, it is a safe haven of learning and growth to achieve his or her potential instead of a few skills thrown in a staccato manner. Meaningful access includes access to teachers, who will provide differentiated support catering to varied learning styles and who will pay special attention to those that need extra nudge to keep pace. And most importantly, meaningful access to provide a safe, gendered space with room to find and express one's own identity shaped by membership in any social group without the fear of mockery or discrimination.

Meaningful access can enable reduced dropout rates, smoother

Table 2: Graded inequality in drop out rates, 2010-11

Primary classes 1 to 5		Elementary classes 1 to 8		Secondary classes 1 to 10	
ST Boys	37.2	ST Girls	55.4	ST Girls	71.3
ST Girls	33.9	ST Boys	54.7	ST Boys	70.6
SC Boys	29.8	SC Boys	46.7	SC Boys	57.4
All boys	28.7	All Girls	41	SC Girls	54.1
All Girls	25.1	All Boys	40.3	All boys	50.4
SC Girls	23.1	SC Girls	39	All Girls	47.9

Source: SES, GOI 2012

transitions between different levels of education, higher learning levels and most importantly, an equal platform for all children to achieve an excellent education.

Safe and Non-Discriminatory Environment

It is said that a school is a microcosm of the society in which we live. More often than not, inter-personal and inter-group dynamics prevalent in the community is also reflected in the school. Teachers, if they are not adequately sensitised and trained, may just transfer behaviour pattern and prejudices to the school. Educational administrators and politicians give this as an excuse for persisting discrimination in schools. This is where we have a lot to learn from countries that have successfully combated this tendency and have insisted that schools and other publicly funded institutions adhere to constitutionally mandated rights and obligations. Taking the right to equality and the right against discrimination enshrined in the Constitution of India, teachers and all educational administrators are duty bound to ensure a non-discriminatory environment in school. Teachers and headmasters do not have the freedom to discriminate on the basis of case, religion, gender, ability or economic status.

Taking the Constitution of India as the guiding spirit, teachers, administrators and community leaders need to be told that any violation of the right to equality and the right against discrimination will invite strict penal action. A non-negotiable code of behaviour needs to be communicated to all those who are involved in school education. This needs to be done in writing and prominently displayed in all schools and educational institutions. Simultaneously, children, especially boys, need to be involved in activities that enable them to understand and appreciate diversity, respect differences and formulate school level norms of behaviour towards other children, and towards girls. Involving children in creating an egalitarian atmosphere could bring moral pressure on teachers, administrators and local leaders not to differentiate or discriminate. (Ramachandran and Naorem, 2014)

As it stands today, teacher orientation and training is often limited to administrative requirements and subject knowledge. There is also growing evidence of training fatigue among teachers. Equally, short duration training programmes are not able to do justice to support basic subject knowledge and pedagogy issues. Creating alternative forums/platforms where teachers and community leaders can come together to communicate the need to ensure that schools are free of discrimination may well be a worthwhile exercise. Essentially, what is required is that we start looking seriously at discrimination in schools and work at all levels to bring about a lasting change on the ground. There are no short cuts and the government and civil society organizations need to take this issue seriously and address it in every context. (Ramachandran and Naorem, 2013 forthcoming)

Despite over two decades of noise about purging our textbooks of blatant and subtle forms of prejudice and stereotypes, the fact is that textbooks reinforce gender inequalities and social hierarchies. Traditional notions of what is masculine and feminine and caste specific occupations persist and peep out from illustrations, phrases and examples in out textbooks. Rural-urban stereotypes are not only promoted, but urban is given preference over rural, and non-tribal over the tribal. Most of the examples across subjects are mostly urban centric. Heroes and leaders are invariably men, and caregivers and homemakers are always women. Given this reality, NCF 2005 focus group argued that, "education is an integral part of these arrangements that govern children's lives. Thus, in order to achieve substantive and equal citizenship, special curricular and pedagogic strategies have to be developed to empower children, specially girls, to overcome disadvantages *and develop their capabilities to exercise their rights and choices*. The aim is to achieve a *substantive equality of outcome*, not merely a formal equality of treatment. In fact, we may even require inequality of treatment, i.e. special treatment for the socially disadvantaged learners, to enable them to achieve equality of outcome…" (NCF 2005, Focus on Gender issues in Education)

A curriculum that is not just "free" of biases, but one that actively encourages critical thinking and foregrounds gender in the construction of knowledge.

"In my textbooks I learned that only men
are kings and soldiers.
Till I read a book in which famous
queens ruled and fought against enemies.
In my textbooks I learned that only men
Are doctors.
When I went to a doctor I saw that she was a woman.
In my textbook I learned that only men
do farming in my country,
until, on a train journey I saw women
working in the fields.
I have learned that I have a lit to learn by seeing"

(Pooja, Ramya, Anuj, Utkarsh students of class VII, Baroda, quoted in NCF 2005 Focus group on Gender Issues in Education. NCERT, 2005)

In order to achieve this goal, the educators and those who frame the curriculum, write textbooks, train teachers and monitor schools have to adopt a substantive and corrective approach to equality. There is a need to be concerned with equality of treatment and equality of outcome. Curriculum and textbooks could be the only vehicle to transmit egalitarian values and respect for diversity and difference and guard against discrimination. Boys need to be taught to respect others, and respect when someone says no. This is essential to combat the culture of sexual harassment (inappropriately called eve-teasing). Equally, the sharp divide between what is masculine and what is feminine needs to be questioned. Such an approach would help educators recognize that gendered differences between girls and boys is not a given and instead it enables them to "examine the assumptions behind it, tries to assess the disadvantage resulting form it, and develops a "different" treatment that dismantles that disadvantage. Girls are also circumscribed by a gendered socialisation that differs across caste, tribe and community, and the rural-urban divide; this results in the creation of differentiated aspirations, capacities, and levels of confidence. This approach to equality addresses such differences in ways that help learners to overcome disadvantages, value their differentiated capabilities, and develop them to the fullest…" (NCF 2005, Focus on Gender issues in Education)

Conclusion

May be a lot more can be said and a longer list of issues that frame women and girls participation in education can be presented. In the last fifty years, several commissions and committees have brought out long laundry lists of issues and concerns and many strategies have also been listed. Reflecting on why these recommendations and strategies have remained unimplemented, I realized that, we need to first and foremost agree on a few non-negotiable maxims or principles. If they are adhered to, then the chances of other inputs falling into place is far higher. It is with this in mind that I have highlighted only three: meaningful access to education, non-discrimination and fore grounding gender in the construction of knowledge. If we are able to push for these three, then may be we can start moving towards greater gender equality and social justice.

Endnotes

This phrase "heterogeneous gendered realities and multiple disadvantages" has been taken from the NCERT report 3.2 – National Curriculum Framework 2005, Position Paper on Gender Issues in Education, New Delhi 2005. This paper is a combination of the EFA Mid-decade assessment commissioned by NUEPA in 2007 and Gendered Inequality in Education published in Devaki Jain and C P Sujaya (Ed), Indian Women Revisited. Publications Division, Ministry of Information and broadcasting, Government of India, New Delhi 2014.

1 "There are well-known substantial differences in well-being across social groups in India… Average per capita income of SC/ST at all-India level is about one-third lower than among other groups. Headcount poverty among other (non-deprived groups in 1999/2000) was 16 per cent, 30 per cent for minorities (Muslims), 36 per cent for SC and 44 per cent for ST… Deprived groups also have lower literacy than other groups… Ranking on neonatal, post-natal, infant, child and under-5 mortality indicators for socially-excluded groups are similar to those of other indicators (e.g. IMR for SC and ST are about 84 and 62 for non-deprived groups). Arjan D Haan: Disparities within India's Poorest regions: Why do the same institutions work differently in different places?, in Equity and Development: World Development Report 2006 Background Papers, World Bank, Washington DC, 2004.

2 C Colclough, P Rose and M Tembon: Gender inequalities in primary schooling: The roles of poverty and adverse cultural practices: International Journal of Educational Development, Vol. 20, 2000, pp5-27

3 Naila Kabeer and Ramya Subramaniam highlighted the "gender intensified disadvantage" wherein "the specific forms of disadvantage faced by girls and not boys that it is also important to acknowledge and that related to roles for girls deriving from gender division of labour, their reproductive cycles and perceptions of risk and vulnerability to sexual violence. These gender-specific forms of disadvantages (Kabeer and Subramaniam, 1999) need to be identified and distinguished from those that are gender intensified in order to facilitate the identification of suitable social policies…" RamyaSubramaniam, UNRISD, 2002

4 RekhaWazir, 2000

5 RamyaSubramaniam: Gender and Education: A Review of Issues for Social Policy, UNRISD, Geneva, 2002; PROBE, 1999)

6 Nambissan, Geetha B. 1996. Equity in Education?Schooling of Dalit Children in India.*Economic and Political Weekly* volume 31(16-19): 1011-1024, April 20-27, 1996. Nambissan, Geetha B. (2000): 'Dealing with deprivation', Seminar, September, No. 493, pgs. 9. Nambissan, Geetha B. (2001): 'Social Diversity and Regional Disparities in Schooling: A Study of Rural Rajasthan' in Vaidyanathan, A. and P.R. Gopinathan Nair (ed.) Elementary Education in Rural India: A Grassroots View, Sage Publications, New Delhi and Ramachandran, Vamala and Taramani Naorem. November 2013. What it means to be a Dalit or Tribal child in our schools: A synthesis of Six-State Qualitative Study. Economic and Political Weekly. Vol XLVIII No 44, November 2, 2013

7 Marie Lall and S SrinivasaRao 2011: Revisiting the equity debate in India and the UK: Caste, Race and Class Intersections in Education - in Marie Lall and Geetha B Nambissan: Education and Social Justice in the era of globalisation: Perspectives from India and the UK, Routledge, New Delhi 2011. Page 34. ❑

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SPECIAL ARTICLE

Inclusive Education in India : A Road Map

Anupriya Chadha

There is an urgent need to restructure the overall goals of the educational system so as not to lose sight of helping students to develop into contributing global citizens. When children fail to learn in schools, it is only too tempting to perceive something wrong within them. It is time that the education system does some introspection

Inclusive education as an approach for addressing learning needs of all learners by addressing barriers is faced by particularly those with specific needs. It implies that *all learners*, young people - with or without different abilities being able to learn together, through access to common pre-school provisions, schools and community educational setting with an appropriate network of support services. This is possible only in a flexible education system that assimilates the needs of a diverse range of learners and adapts itself to meet these needs. Inclusive education is thus, about achieving the basic human and civic rights of all, including those with physical, sensory, intellectual or situational impairments, through the creation of inclusive policies and practices at all levels of education systems, their values, knowledge systems and cultures, processes and structures. National Curriculum Framework for School Education (NCERT, 2005) has recommended inclusive schools for *learners with special educational needs* by making appropriate modifications in the content, presentation and transaction strategies, preparing teachers and developing learning friendly evaluation procedures.

Exploring the Present Education System

In the light of this, it is important to examine and explore the practices and ideology that hinder or promote the creation of a more inclusive educational system. The current practice of focusing solely on the 3R's approach has led to education being viewed not as a process, but as a product: the tangible reward consisting of a report, marksheet, or degree at the end of the academic year. There is an urgent need to restructure the overall goals of the educational system so as not to lose sight of helping students to develop into contributing global citizens. When children fail to learn in schools, it is only too tempting to perceive something wrong within them. It is time that the education system does some introspection.

The challenge, given this interpretation of 'inclusive education', is that we have to create inclusive schools in which:

- Everyone belongs, is accepted, supports, and is supported by his or her.
- Peers and other members of the school community in the course of having his or her educational needs met.

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A traditional classroom is one in which the adults make all decisions concerning lessons, the teaching activities by which the students are expected to learn, the assessments which tend to focus on paper and pencil tasks that are quick and easy to evaluate, and comply with. Often, the format is teacher lecture or student worksheets. The common metaphor for this type of classroom is that of the students as vessels that the teacher is to 'fill' with necessary knowledge. Inclusive classroom, on the other hand, is an environment, within which teachers and students provide support and guidance to the community of learners within the school and where teachers and students may explore curriculum while benefiting from contributions of various ability peers. Teachers who are inclusive are consistently moving away from rigid, textbook – and basal-driven frontal teaching toward & cooperative learning, whole language, thematic instruction, critical thinking, problem solving, and authentic assessment.

Diversity of needs is undoubtedly a challenge. But it is also an opportunity to enrich learning and social relations: a pedagogical challenge for the system and the institution, rather than an individual problem. To face up to this challenge means reforming systems and schools and restructuring classroom activity so that all learners can respond to opportunities and all teachers can construct them. If inclusive education is really to contribute to an accelerated achievement of Education For All, it is important that account be taken of the new demands, challenges, difficulties, dilemmas and tensions that this change will imply.

Schools must be recognised as major arenas of social experience preparing young citizens of the world community. In this light, *inclusion* seems to be the obvious solution for creating a more tolerant, civilised and plural world community. Schools have complex and conflicting responsibilities, being both products of their cultures and cutting edges to change that culture. That is why involving the local community is essential in any movement towards inclusive education. The diversity of learners is itself a rich resource for learning. Peer tutoring and peer collaboration draws on children to act as resources for their learning communities. Parents of all learners have a deep knowledge about their children and this can be particularly valuable for children and young people whose learning becomes a focus of concern, such as some learners with impairments. There are, thus, learning opportunities within all communities which can be exploited for education.

Diversity of needs is undoubtedly a challenge. But it is also an opportunity to enrich learning and social relations: a pedagogical challenge for the system and the institution, rather than an individual problem. To face up to this challenge means reforming systems and schools and restructuring classroom activity so that all learners can respond to opportunities and all teachers can construct them.

Road Ahead

While inclusion is a very attractive philosophy, one that virtually every professional spoken to agrees to some degree, is that practice differs substantially from school to school and indeed from teacher to teacher. Even though there may be no "one plan fits all", there are certain teaching strategies that meet the unique educational, social and instructional needs of all students within general education classes. These strategies are necessary so that inclusion proceeds from an ideological and value laden stance to classroom practice.

Provision for Diversity

The success of inclusion lies in the hands of the class teacher who is the ultimate key to educational change and school improvement. S/he is at the forefront of implementing the stated policies within the constructed educational realities. This requires an attitudinal change whereby all members of the community must be valued in spite of differences. Teachers must believe that all students can learn and plan for the success of diverse learners. It is imperative that teachers accept, recognise and celebrate diverse learners in the classroom i.e. they must promote equity through accepting differences.

Effective teaching in an inclusive classroom therefore demands teaching strategies that can accommodate a variety of learners with different backgrounds, needs and strengths. These strategies in my view address three crucial areas within the classroom:

- The context of learning.
- The content of learning.
- Teaching Learning Processes.

Context of Learning

If inclusion is seen as a two-way process of increasing participation and reducing or removing barriers that

inhibit the learning and participation of learners, the planning of the context of learning is a crucial element. This involves not only environmental modifications, e.g. physical arrangements, room modifications such as mounted railings at strategic locations, rearrangement of the floor space for wheelchair accessibility, etc, but also a shift in focus from the prevalent rigorous academic approach in mainstream schools, in which the measurement of academic performance is the critical variable. In an inclusive setting, where a great sense of community and trust exists because children of different ages (vertical grouping) work together in an atmosphere of cooperation rather than competitiveness, provides evidence that a carefully planned environment with relevant materials and experiences for the learners, is essential for all children.

It is important that general education accepts the notion that social skills and peer relationship are equal to, if not more important than academic achievements. Teaching strategies for enhancing a climate of trust and interactive peer relationships through cooperative learning groups work very successfully in mainstream schools. Students not only help explain material to each other but share experiences, providing multiple perspectives and mutual support. Groupings can be as varied as pairing i.e. students working in groups of two or larger groups of mixed abilities with each member assigned a specific role. e.g. time keeper, presenter, etc. Thus, cooperative-learning results in the classroom not becoming a competitive place where students attempt to prove themselves and outshine others, but environments, in which students support and nurture each other's learning.

Content of Learning

The goal of quality instruction is more often idealised than realised, as teachers struggle to provide effective instruction. Teaching has so far been mainly based on criterion of averages, which means that while some students cannot keep up, others find teaching "too easy" and boring. In order to meet diverse needs in the classroom, differentiated instruction must be planned based on the unique learning profiles of individual students. Differentiated classrooms offer a variety of learning options designed to tap different readiness levels, through providing:

- A variety of ways for students to explore curriculum content.
- A variety of activities through which students can understand and "own" information and ideas.

Teaching has so far been mainly based on criterion of averages, which means that while some students cannot keep up, others find teaching "too easy" and boring. In order to meet diverse needs in the classroom, differentiated instruction must be planned based on the unique learning profiles of individual students.

- Options through which students demonstrate what they have learnt (e.g. developing preferred stimulus-response format based on students preferred learning style written/oral/or using alternative augmentative communication systems).

To meet the varied learning needs of students in a classroom, methods that focus on differentiating instruction must move away from a single prescribed lesson and provide teachers with the flexibility to adjust factors such as learning objectives and pace of instruction. Instruction that is concept-focused and principle-driven utilising task analysis (a breakdown of each individual step or skill, with necessary adaptations) benefits not only children with disabilities, but also other students in the classroom to reach established goals.

Teaching Learning Processes

Inclusion cannot mean simply folding all children into the status quo of the general classrooms to be fed pre-decided information. Acquiring knowledge is active, not passive. It has to transform and this requires the learner's participation. In an inclusive classroom, varied activities will often occur simultaneously. Therefore, teaching processes must undergo a shift from being teacher-centred to learner-centred. Students must develop into "active explorers" and for this, the strategy of promoting inductive thinking is a very useful teaching tool.

Utilising this strategy requires the teacher to provide all students with a series of relevant experiences, providing support to analyse rules and principles through discovery learning. Keeping this in mind, the National Council of Education, Research and Training has recently developed exemplar material on curricular adaptations, inclusive teaching and how to adopt flexibility in evaluation for children with disabilities in inclusive classrooms. The material is based on an approach whereby the teacher provides meaningful learning experiences to all children in the class and uses simple language and expressions that values all children. The material comprises of a number of examples that demonstrate how to change the current teaching practices in inclusive classrooms, and support students to become independent learners and actively participate in the learning process. 1.58 lakh

mainstream teachers under Sarva Shiksha Abhiyan have already been trained on this exemplar material.

Future Steps: Teacher Capacity Building

The development of inclusive education not only entails a constant change in teachers' values, attitudes, professional expertise and knowledge, but also on those responsible for their training and support. To deal with this 'sea-change of change', a continuous and coherent programme of professional development is needed for all educational personnel. Since the teacher will be primarily responsible for bringing about this radical change, in practice, it is vital that careful planning is undertaken to provide the required capacity building and make inclusive education a reality.

Although educators may profess a more learner centred approach to education, the methods of teaching and learning employed in teacher education may contradict that commitment and the teacher trainers may remain unconvinced. In many teacher education courses, inclusion is considered as an add-on module, usually associated with learners with impairments or those categorised as having 'special educational needs', rather than permeating the approach to education in all courses for all students. Thus, issues of gender, ethnicity, language differences etc are silently brushed aside. There is a need for urgent reflection and introspection of both general and special education courses in order to pave the way for a dynamic '*inclusive education course'* that meets the challenge of the day.

The new approach of Continuous and Comprehensive Evaluation (CCE) is a positive step in this direction. CCE refers to a system of school-based evaluation of students that covers all aspects of students' development. It emphasizes on two fold objectives. These objectives are continuity in evaluation and assessment of all aspects of a child's educational process. Evaluation of identified aspects of students' growth and development is a continuous process rather than one annual exam or half yearly exams conducted after a specified period of time. The second term `comprehensive' means that the process covers both the scholastic and the co-scholastic aspects of students' growth and development.

Educating students in an inclusive setting, therefore, will succeed, when it is pedagogically equitable and when the focus is on the inclusion of all learners to be taught using diverse ways of learning: education delivered through a format of questioning, research, cooperative learning, individualised expectations, and critical thinking – all generally captured under the term "best practices." Every child in school should be provided with equitable access to curriculum, textbooks and teaching learning material in the form best suited to his/her learning needs. ❑

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Education of the Marginalised, SCs & STs: Issues, Challenges and the Way Forward

S Srinivasa Rao

Any process of change thus has to carefully look into the combined effects or inter-sectionality of caste/tribe, gender and social class. For both Dalit and tribal boys and girls, school must be a liberator from their deprivations accrued from their historical antecedents and by virtue of their birth into a particular community. Both school and society shall thus need to be more inclusive, just and fair to children from these communities so that the Indian society can then truly claim itself to be a democratic society where all its citizens are treated equal

Education is the means through which individuals and groups achieve social mobility in modern societies such as ours. It is also instrumental in re-structuring the social order which is generally hierarchically organised and where inequalities are ubiquitous. In the Indian society which is essentially and historically structured along the caste lines, social inequalities are produced and reproduced along the caste lines primarily. Certain castes are privileged and certain others are not, in terms of economic means, social status, political participation and educational opportunities. Castes, such as Scheduled Castes, which are dis-privileged are those which are at the bottom of the traditional occupational hierarchy and are shunned to be not even part of the spatial and social boundaries of the society in general or the village community in particular. Similarly, another group which had been on the margins of the Indian society at large is the Scheduled Tribes, that lived in geographic isolation, away from the so-called 'settled', 'mainstream', 'civilised' societies, in forests, hills and terrains that are not easily accessible, with their unique cultures, religious practices, languages and ways of life. While these groups have had a life that was distinct from the rest of the social groups in the Indian society, they had a unique synchrony of their life with the nature surrounding them. The geographical isolation however, led these groups to unequal participation in social, economic, political and educational spheres of the developing society.

As a result, these castes and tribes remained for many decades and centuries on the margins of the socio-economic and educational development and are forced to live a life of subjugation and deprivation. It goes without saying however that, after Independence, the launching of India as a democratic society, giving equal rights to all its citizens irrespective of their social identity and group membership, had indeed transformed their participation in almost all walks of social life including education. However, the levels of inclusion of these groups into the society and educational arena vary in comparison to other privileged social groups that have had historical advantage.

Issues

While in some respects, these groups have achieved some educational advancement, they lag behind in certain other respects which continue to keep them on the margins of the educational, developmental and social mobility

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processes, thus leaving much to be desired to make members of these castes and tribes as equal members of the hitherto unequal Indian society. One area where these groups have shown tremendous progress is in terms of enrolments at all levels of education. In primary education, at the first standard of entry into structured and formal education, the enrolments match the most privileged, but by the time they arrive at standard five, their numbers seem to dwindle. For example, the Government of India Report on 'Education for All: Towards Quality and Equity', published by National University of Educational Planning and Administration (NUEPA) in 2014 documents that between 2000-01 and 2013-14, the enrolment of SC children in primary education increased from 21.3 million to 26.3 million, marking an increase of 24.1 per cent in just one decade. Similarly, the enrolment of ST children in primary education during the same decade has increased from 11 million to 14.7 million, registering 33.6 per cent of increase. At the upper primary level too, both SCs and STs have registered a significant progress (from 6.7 million to 12.9 million in the case SCs and from 3.1 million to 6.5 million in the case of STs) during 2000-01 to 2013-14.

In terms of gross enrolment ratios in the entire elementary education, there has been a steep increase from 86.8 per cent in 2000-01 to 107.7 per cent in 2013-14 in the case of SCs and from 88 per cent in 2000-01 to 105.52 per cent in 2013-14 in the case of STs. It may be noted that GERs crossing 100 per cent is due to the enrolment of under-aged or over-aged children in that particular standard segment. Interestingly, the Report does point out an increase in the GER of girls in comparison to boys among SCs, substantially higher for SC girls than that of the SC boys (48.6 per cent for SC girls and 18.8 per cent for SC girls). That means, the parents and communities from among the SCs and STs are enrolling their children, both boys and girls, in the elementary (both primary and upper primary) school class and are exhibiting eagerness to make them literate and educated. However, in the case of STs, there has been a decline of 2.5 per cent points for boys, whereas for girls, there has been an increase of 26.4 percentage points during 2000-01 to 2013-14. Thus, overall rise of enrolments, Gross Enrolment Ratios and those of girls in particular at the elementary level of education are indeed a welcome development and a matter to feel happy about.

However, the excitement of gains in the enrolments fizzle-out when one observes the drop-out rates at the elementary stage. While the drop-out rate for all categories of children was 42.3 per cent in 2008-09, it is 47.9 per cent for the SC children and 58.3 per cent for ST children. That means nearly or above 50 per cent of those who enter into the elementary school leave it by the time they complete that particular stage of education. Some analysts may claim that inspite of such high levels of drop-out, there indeed was a decline of the trend over the years. However, this reasoning and justification does not help in the overall achievement of universalization of elementary education. Thus, it continues to be a major hurdle for the country to claim provision of basic education for all its children. This issue of drop-out and retention accelerates as children move up the higher levels of education ladder. It means that while entering the school was exciting for children and their parents, but it was not so exciting to continue in the school till they attain some decent levels of education. For children coming from SC and ST homes, it means that they remain mostly non-literate or poorly literate and thus will continue to be in the marginal or disadvantaged position to claim benefits of education and development the country seems to be witnessing. In fact, SCs and STs may be pushed to further misery and disadvantage as other social groups are already marching at much faster pace due to their historical advantage in literacy and education to gain from the avenues that are opened up in the educated employment market. Thus, in a way, there has been an exacerbation of inequalities in society as a result of marginal or negligible improvements in the educational attainments of the marginalised.

The structures of poverty, social class, caste and social identities reproduce in ways that further widen the inequalities between and among the children from various social backgrounds and between the teachers and children as also teachers and the parents of the children. Clubbed with this, teacher apathy and differential treatment deter the children from these communities away from the school, making it a hostile space for learning.

Challenges

For children of Scheduled Castes and Tribes, while access, both physical and social, has been largely attended to, thanks to a series of initiatives like Operation Blackboard (OBB), National Literacy Campaigns (NLCs), District Primary Education Programme (DPEP) and Sarva Shiksha Abhiyan (SSA), the school remains an unattractive space for them to remain in and complete atleast the basic levels of education. No doubt, schooling has become accessible physically for children from SCs and STs more now than before, but the school as a space for equal educational experience for all children, more so for SC and ST children, did not transform as much. The structures of poverty, social class, caste and social identities reproduce in ways that further widen the inequalities among the children from various social backgrounds and between the teachers and children as also teachers and the parents of the children. Clubbed with this, teacher's apathy and differential treatment deter the children from these communities away from the school, making it a hostile space for learning.

Studies have amply established the discriminatory and exclusionary

notions of teachers which view children from these communities as 'unintelligent', 'unworthy', and 'unfit' for learning and education and that they are fit to be performing their traditional menial jobs or to stay around the forests and hills. Some researchers have even demonstrated that dalit and tribal children are perceived to be 'slow', 'unclean' and 'uncivilised' and therefore are not suitable to learn. Studies have also established that the ideas of untouchability and social and geographic isolation are reproduced not just in the society in general, but in the schools as well. Experiences of social discrimination and exclusionary attitudes towards children from SC and ST communities in the implementation of mid-day meal scheme meant to retain these and other poor and disadvantaged children are also now well documented. Interestingly, such reports of differential treatment are not just limited to the rural areas, but also the urban areas too. It is now clear from the researches that the social segregation does exist in urban society in India in general and the urban schools in particular. Thus, the social differentiation is largely reproduced in the anonymous and impersonal social spaces too, though the nature and form of such differentiation vary from that of the rural areas.

The Way Forward

In order to retain children in schools and halt their drop-out from schools, it is imperative for the governments, schools and communities to provide egalitarian schooling experiences for all children, more so for those coming from SC and ST backgrounds. If school remains an unattractive and hostile space for these children, the overall educational participation of these children in schooling will remain much to be desired and, as stated earlier, may even further widen disparities. There is thus, a need to move beyond mere enrolments at elementary and subsequent levels of education. Once the school becomes a place for joyful and inclusive learning experience, it will facilitate children from these groups to move onto higher levels of education, which in turn will ensure their absorption into the educated labour market. Already, we find the SCs and STs breaking the barriers to enter higher educational institutions in larger numbers than before, are entering into diverse subject areas and those which are sought after, which will eventually alter the occupational and economic structures of Indian society that in turn will make a pool of skilled and educated human resources that can contribute to the overall development of the country.

One important challenge however, is to make special efforts to include and make schooling accessible to a large number of girls from among the SCs and STs as these girls are double or triple disadvantaged in comparison to their male counterparts. Girls from among these communities are disadvantaged in terms of caste/tribe, gender and social class, which compounds their educational exclusions. Any process of change thus, has to carefully look into the combined effects or inter-sectionality of caste/tribe, gender and social class. For both Dalit and tribal boys and girls, school must be a liberator from their deprivations accrued from their historical antecedents and by virtue of their birth into a particular community. Both school and society shall thus need to be more inclusive, just and fair to children from these communities so that the Indian society can then truly claim itself to be a democratic society where all its citizens are treated equal. ❑

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Accessible India Campaign to Achieve Universal Accessibility for Persons with Disabilities Launched

"Accessible India Campaign" (Sugamya Bharat Abhiyan), a nationwide campaign that will enable persons with disabilities to gain universal access, equal opportunity for development, independent living and participation in all aspects of life in an inclusive society was launched recently.

Under the campaign, atleast 50 per cent of all the government buildings of National Capital and all the State capitals will be made fully accessible for persons with disabilities by July 2018. All the international airports in the country and railway stations of A1, A & B categories will be made fully accessible by July 2016. As per campaign drafted by Ministry of Social Justice & Empowerment, atleast 10 per cent of government owned public transport carriers in the country will be converted into fully accessible carriers for these persons by March 2018. It will also be ensured that atleast 50 per cent of all public documents issued by the Central Government and the State Governments meet accessibility standards for persons with disabilities by March 2018.

A web portal and mobile application for creating a crowd sourcing platform to get information about inaccessible was also launched on the occasion.

The National Awards are conferred on 3rd December every year on the 'International Day of Persons with Disabilities' on outstanding Persons with Disabilities; individuals and organizations that are working for the empowerment of persons with disabilities.

This year, the National Awards were conferred on 52 individuals/institutions under fourteen broad categories. One Award pertaining to the year 2014 was also conferred during this year.

Vocationalisation of Education in India

Amit Kaushik & Radhika Roy

What is important to recall is that increasingly, employers all over the world seek recruits who can handle the 4 Cs – communication, collaboration, creativity and critical thinking. Any education or skilling system must therefore, provide trainees with these skills and the ability to adapt to changing circumstances, so that they will be able to handle the demands of future, yet-to-be-announced, jobs

Education in India has historically been the preserve of only a few. Before the advent of the British, scriptures and other forms of traditional learning were passed down through generations in the *Gurukul* tradition, but usually only to those who belonged to the Brahmin caste. Non-Brahmins were mostly excluded from this knowledge, but learnt the family trade as a natural part of their upbringing. Thus, the skills needed for various trades tended to be transmitted to each succeeding generation, providing skilled artisans and labour for society's requirements. Opportunities for entrepreneurship were built into these trades, hence ensuring that a skilled worker found adequate opportunity to earn a livelihood, and in many cases, prosper.

The nature of education changed all over the world after the Industrial Revolution. Several trades became redundant and new opportunities such as factory work, railways, etc began to emerge, changing the way people earned their livelihoods. In India, the infamous Macaulay Minute resulted in wide ranging changes to the way education was perceived and delivered, given its new objective of the creation of a class of people "…who may be interpreters between us and the millions whom we govern; a class of people, Indian in blood and colour, but English in taste, in opinions, in morals, and in intellect".

Even as the education system changed to accommodate standardization for factories/ administration, it also began to diverge from traditional knowledge – science, maths, and English had now to be learned, with those who were the intermediaries between the British and larger India being seen as a class divorced from labour. This elite in pre-Independence India formed a new class of civil servants, doctors, professors and lawyers, who were distinct – and very different in outlook, education and taste from the vast mass of those who remained poor and uneducated. Slowly, the great divide in education became about how much money one had and which school or overseas college one attended, rather than about the learning passed down through generations. In turn, and almost inevitably, those without education were also those with the fewest opportunities to better themselves.

In newly independent India, notwithstanding Mahatma Gandhi's emphasis on village economies, economic policy and thought was guided by Pandit Jawaharlal Nehru's view on industrialisation and the need for the State to occupy the "commanding heights" of the economy. More attention was paid to higher education with the creation of institutions of excellence such as the IITs and IIMs, and engineering

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and medical colleges, which began to produce graduates for the newly industrialising nation. In the process, school and vocational education took a backseat; in the decade between 1950 and 1960, even as we produced more engineers and doctors, the actual number of illiterates in the country rose from 294.2 million to 325.5 million.

In a sense, this divergence was also institutionalised –higher education became a focus area for the Ministry of Education (as it was then), while skills education and labour policy were relegated to the Ministry of Labour. Given that these two departments often competed for the same scarce resources, it was only a matter of time before education and skills development came to be viewed as separate from each other. Aspirations for growth and personal advancement began to be associated with higher education and not skills or working with one's hands, as a result of which, only 2 per cent of all those working in industrial or semi-industrial trades were formally or professionally skilled.

The new millennium brought with it a realisation that this divergence could have a disastrous impact on India's future. India's demographic dividend and opportunity to re-establish herself as a leading economy had to be addressed through adequate skilling of youth for employability and contribution to the nation's economy as well as a global workforce. This was reinforced by Dr. C.K. Prahlad, in his famous Vision of India at 75 address in 2007, to thought leaders of the country, where he shared his belief that India would shape the emerging world order and change not only its own destiny but even that of the world through economic strength, technology innovation and moral leadership. He envisioned India to be the moral voice for people around the world, to practice inclusiveness and sustainability, and to be the most benchmarked country for its capacity to benefit from its own diversity.

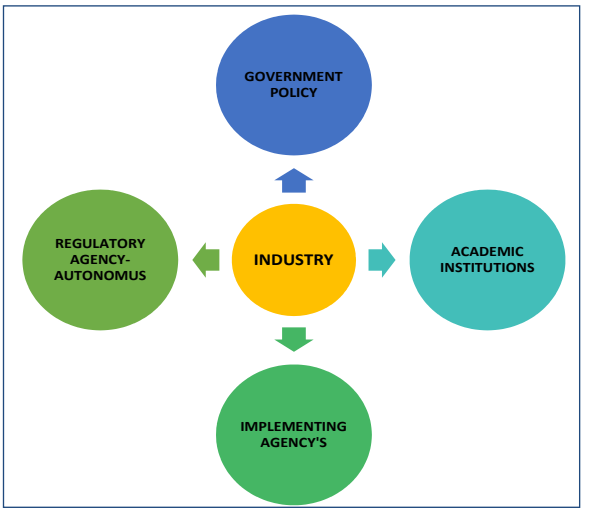
This period saw an upsurge of initiatives to address the convergence of education and skills, such as the framing of the National Skills Policy 2009, as well as the establishment of the National Skills Development Corporation (NSDC), National Skills Development Agency (NSDA), the creation of the National Skills Qualification Framework (NSQF), and setting up of the Sector Skills Councils to spearhead the selection and articulation of outcome oriented competencies for high volume jobs.

The NSQF is a particularly potent initiative, as it provides the framework for a much needed convergence between education and skills by enabling mobility between formal and vocational education, while also creating a framework for enabling recognition of the large numbers of informally skilled individuals, with the opportunity for future career progression. If implemented as designed, this initiative has the power to dramatically reset the relationship between education and skills. Today, there are various experiments being conducted for Recognition of Prior Learning (RPL) and vocationalisation of schools and colleges, which have already been benchmarked in the revised National Policy for Skill Development and Entrepreneurship 2015.

The formation of the Ministry for Skills Development and Entrepreneurship (MSDE) to coordinate the various skilling initiatives in the country, and the Make in India and Skill India campaigns have also gone a long way in re-energising the relationship between education and skills, by igniting youth interest in acquiring skills formally, and industry participation in recognising skills certifications along with educational qualifications. The integration of new technologies and the recognition of 21st century skills of design thinking, problem solving, analytics and entrepreneurship will necessitate a revamp to the approach to school curricula and open doors to even greater synergy between industry and education.

Government of India also launched the National Skill Development Mission on 15th July 2015, which coincided with the World Youth Skills Day. The Mission has been set up to deliver the Skill India campaign and will create convergence across sectors and States on skills training activities. As of now, the country has 249 training partners,3222 training centres,55,70,476 trainees, with 23,88,009 placements so far. While there are many schemes and missions under different ministries like the *Deen Dayal Antyodaya Yojana* (skill training for urban and rural poor), the Digital India and Make in India campaigns are all steps to encourage skills development to develop products within India by Indians.

Fig 1 – The Centrality of Industry in Driving Demand for Skills



While the government has laid great emphasis on provision of skills training, and assessment and certification, particularly at younger ages, it is also necessary to consider the demand side of this equation. The availability of more and more skilled personnel will need to be accompanied by the creation of increased demand for their services, which in turn, is dependent on the growth of the economy. Economic and financial policies must spur growth and development, and lead

to the creation of jobs that can absorb the young people graduating from various courses. Whether it is policy or academia or regulation, all must work closely with industry to ensure that supply and demand for skills are at all times, properly matched.

Many of the jobs we currently train our young people for will become redundant in time; indeed, it is impossible to predict with any degree of accuracy, the kinds of jobs that will be handled by young people in the future, just as many of the jobs, that they presently do could not have been imagined 25 years ago. What is important to recall is that increasingly, employers all over the world seek recruits who can handle the 4 Cs – communication, collaboration, creativity and critical thinking. Any education or skilling system must therefore, provide trainees with these skills and the ability to adapt to changing circumstances, so that they will be able to handle the demands of future, yet-to-be-announced, jobs.

With India set to contribute heavily to the global workforce in the years to come, it is necessary to start young. With vocationalisation of schools and the orientation of youth towards future employability and skills associated with future jobs, India will have come a full circle in the convergence of education and skills. ❑

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Coir Udyami Yojana

The Coir Udyami Yojana is a credit linked subsidy scheme in the coir sector. The pattern of financial assistance under the scheme is 40 per cent of the project cost as Government of India subsidy, 55 per cent as loan from Bank and 5 per cent beneficiary contribution. The Scheme covers any type of coir project with project cost upto Rs.10 lakhs plus working capital, which shall not exceed 25 per cent of the project cost.

Entrepreneurs under CUY can participate in exhibitions etc. by forming Marketing Consortia for which an amount of Rs.10 Crores is earmarked in the Scheme. The Board is providing Skill Development Training and organizing seminars etc. under the Scheme Skill Development and Mahila Coir Yojana.

NORTH EAST DIARY

SUPERSPECIALITY COURSES FOR NORTHEAST DOCTORS

As part of a new initiative for the NorthEast, various super-speciality courses for doctors from the eight North-Eastern States have been announced by the Ministry of DoNER. The courses include for Doctor of Medicine (DM) and Master of Chirurgiae (Mch). These courses will also be taken up in the institutions outside Northeast and also an as option for short duration training up to six months in super-specialty. Initially, a six months short-term training in Medical Oncology and Surgical Oncology will be undertaken from January 1, 2016 at the Adyar Cancer Institute, Chennai. The cost and financial implications of this training course will be borne by the Ministry of DoNER. This same Institute will also start a three-year DM Oncology and Mch Oncology Surgery degree course from next academic year after getting approval from Medical Council of India (MCI) .This has been done in the wake of prevalence of cancer being the highest in the country among the North-Eastern States, with Mizoram, Nagaland and Meghalaya among the first three States, with the cancer of head and neck.

The DoNER Ministry will also collaborate with the Union Ministry of Health for their support through programmes to control non-communicable diseases. The corporate hospitals have also been asked to come forward in this direction. Non-communicable diseases like Diabetes and heart attack have also shown an increase in the North-Eastern region. For this, Diabetes clinics and Apollo OPDs in Northeast, will be opened. ❑

NEW RAILWAY LINE IN NORTH-EAST

The First Broad Gauge Fast Passenger Train has been flagged off from Silchar to Guwahati via Lumding, Haflong through Remote Control by organizing a Video-Conferencing between Rail Bhawan, New Delhi and Silchar Railway Station. This new line will connect Silchar by BG railway line, benefitting the people of Barak Valley, as also in connecting to the hitherto isolated states of Tripura, Mizoram and Manipur. The track passes through the verdant North Cachar hills almost parallel to the old Metre Gauge alignment crisscrossing the MG alignment at many locations in the first 100 kms between Lumding and Migrendisa. Thereafter, the proposed BG alignment detours for 30 km before joining the MG alignment again near Ditockchera. Phase-2 of the total project consists of gauge conversion of Badarpur-Kumarghat (118 km) and finger lines Arunachal-Jiribam (50 Km), Baraigram-Dullabcherra (29 km) & Karimganj-Mahishasan including Karimganj bye pass line (13.50 km). This phase will be completed by 31.03.2016 for which, mega block has already been taken from 01.10.2015 for six months. The current estimated cost of the entire project is around Rs.6000 crores. ❑

Access to Education

Shailendar Sharma

Capacity in the existing institutions should also be increased, wherever there is demand. An innovation in higher education needs to be encouraged and curriculum review should be conducted to ensure that the students in Higher Education Institutes are ready for the job market or self-employment. Creating a network of institutions will help addressing problem of lack of experienced faculty. Research in the area of higher education needs to be encouraged and financed by the government and private sector

Historical evidences show that in India, education was a privilege and was only accessible to people who belong to upper class and caste and was not accessible to the masses. The educational content was largely religious coupled with elitist medium of instruction making education more inaccessible to society at large. This monotony broke during India's struggle for freedom when demand for state sponsored Free and Compulsory Education was placed before Hunter Commission in 1882. In 1911, a Bill was moved for compulsory education in the Imperial Legislative Assembly, albeit unsuccessfully, and in the midst of stiff resistance. The demand was reiterated in 1937, at the All India National Conference on Education where the idea of self-supporting 'basic education' for a period of seven years through vocational and manual training was proposed. This concept of self-support was floated in order to counter the Government's persistent excuse of lack of resources. The next landmark development in the history of Free and Compulsory Education (FCE) in India was the Post War Plan of Education Development of 1944, also called the Sargent Plan[1], which recommended FCE for eight years (six to fourteen years' age group).

Thereafter in 1968, the National Policy on Education (NPE), was formed which was the first official document evidencing the Indian Government's commitment towards school education. The NPE went through a couple of amendments thereafter. A key milestone in history of achieving access to education was 86th Constitutional Amendment Act passed in December 2002 making free and compulsory education a Fundamental Right for all the children in the age group of 6-14 years. Article 21-A of the Constitution of India and its consequent legislation, the Right of Children to Free and Compulsory Education (RTE) Act, 2009 which became operative in the country on 1 April 2010, makes it incumbent on Government to provide free and compulsory education to children of 6 to 14 years of age[2].

Not undermining the contribution of the State Governments, education being on concurrent list, Government of India also initiated several schemes/ programmes to improve access to quality education. Following is a list of key programmes/schemes which Central Government started during the last two decades .e:1991 (when Globalisation began) or so.

- Operation Black Board (OBB)
- Lok Jumbish Project
- Strengthening of Teacher Education
- Mahila Samakhya

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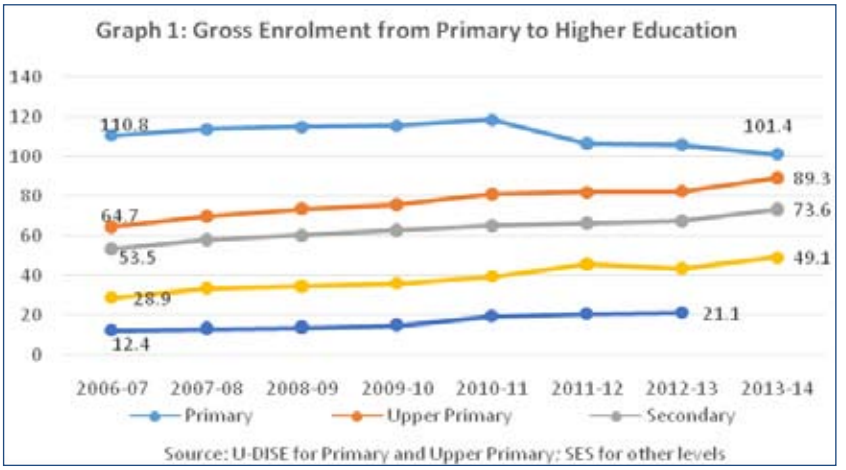
- Education Guarantee Scheme and Alternative and Innovative Education (EGS and AI)
- District Primary Education Programme (DPEP)
- Kasturba Gandhi Balika Vidyalaya (KGBV)
- Model Schools
- Mid-day Meal Scheme (MDM)
- Scheme for Providing Quality Education for Madrasas (SPQEM)
- Infrastructure Development in Minority Institutions (IDMI)
- Sarva Shiksha Abhiyan (SSA)
- Rashtriya Madhyamik Shiksha Abhiyan (RMSA)
- Rashtriya Uchchatar Shiksha Abhiyan (RUSA)

Through the above mentioned programmes and schemes, significant progress has been achieved to provide "access to schooling facility". However, "access to education" demands not merely physical access to a neighbourhood school within a notified distance, but also social access by providing basic facilities, adequate teachers and addressing exclusionary practices, especially those based on caste, gender, ethnicity and disability.

Access and Participation

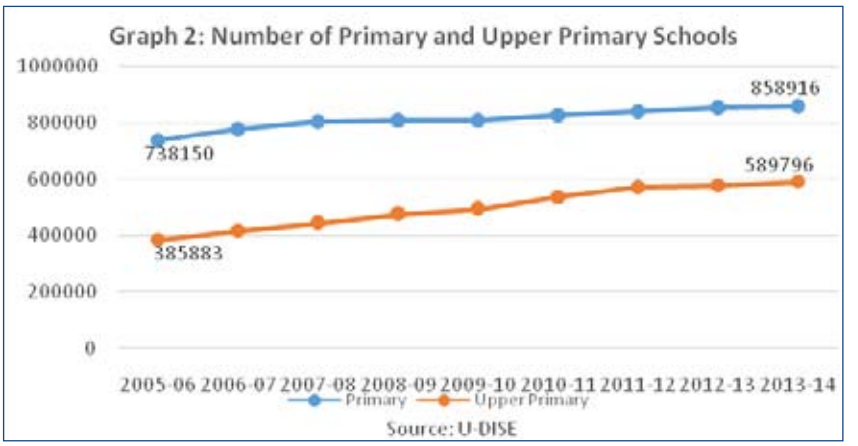
Gross Enrolment Ratio (GER)

One of the proxy, yet most useful, indicator for assessing the access to education is GER. It is defined as the percentage of the enrolment in classes under consideration to the estimated child population in the relevant age groups. Enrolment in these stages includes under-age and overage children. Hence, the total percentage may be more than 100 per cent in some cases. As evident through Graph 1, GER at Primary level is highest and decreases as we move up in the level of education. This clearly indicates large number of children dropping out of system before completing basic education and only one out of five children make it to the higher education. It is pertinent to mention that there are States where the GERs



are significantly lower than the national average and smaller pockets (District or Block) may be far lower GERs than the averages. Therefore, a detailed analysis with GERs by gender, social category and State/District will assist in identifying the special focus areas within States and Districts.

Elementary Level: SSA, during its more than a decade long investment has sanctioned hundreds of thousands of schools, which has resulted in significant increase in the number of primary and upper primary schools. In 2005-06, the country had 7,38,150 primary schools which increased by 59 per cent (8,58,916) in 2013-14. These schools were mostly sanctioned on the basis of the state specific norms for opening new schools in unserved habitations. The norms for primary was normally 1 Kilometer (km) and upper primary 3 Km. Access was nearly universalized at primary level (around 98 per cent as per MHRD reports) by 2010. While at upper primary level, there were still gaps. With the RTE Act coming into force, every child became entitled to having elementary education in a neighborhood school. This necessitated the requirement of defining neighborhood and providing new schools wherever required. Subsequently, States defined their neighborhood and new schools were was provided according to the State RTE Rules. In cases where it was not possible or viable to open a school within the neighborhood e.g. small and scattered habitations, difficult terrain and unavailability of land etc. transport/escort facility work provided to children to enable them attend the near by school. Alternatively, residential facilities were also provided (mostly for children in the upper primary age group) to address issue of physical access. Residential facilities were also provided to facilitate access for children without adult protections living in urban areas.



Social access has come gradually into focus to address the issues of equity. Schools have been opened in areas that have concentration of marginalized communities like Scheduled Caste (SC), Scheduled Tribes (ST) and Muslims. The special scheme, called Kasturba Gandhi Balika Vidyalaya (KGBV) is implemented within the SSA to provide residential facility to dropped-out girls at upper primary level. Over 2500 KGBVs have been operational and the interventions has created enormous interest and demand. A substantial increase is observed in case of upper primary schools which were 3,85,883 in 2005-06, increased by almost 52 per cent (5,89,796) in 2013-14.

Secondary Level: Substantial progress has been achieved in terms of expansion of secondary schooling facilities. The major RMSA interventions that had a direct bearing on the expansion of schooling facilities and achieving the goal of universal access to secondary education include the following:

- Upgradation of existing schools and opening of new secondary schools: Since the commencement of the RMSA, a total of 11,599 new secondary schools were sanctioned. Of these, 10,082 (86.9 percent) schools have been made functional, with a total enrolment of 972,000. New secondary schools have been sanctioned in 30 States/UTs. The States which had received approval for opening more than 1,000 schools included Jharkhand (1,000), Tamil Nadu (1,096), Bihar (1,153), Chhattisgarh (1,357), Madhya Pradesh (1,428), and Uttar Pradesh (1,504).
- Construction of additional classrooms in existing schools: Up to 2014-15, sanctions were issued for construction of a total of 52,715 additional classrooms. Out of these, a total of 20,839 additional classrooms have been constructed. Construction of 16,774 is in progress[3].

Higher Education: As mentioned earlier, GER may be used as a proxy indicator to measure access. As evident in the Graph 1 above, higher education GER was 12.4 per cent in 2006-07 which substantially increased to 21.1 in the year 2012-13[4]. Twelfth five year plan of the higher education suggest the following for expansion of higher education[5]:

- Expand access by scaling up capacity in existing institutions rather than increasing the number of institutions, with the exception of new institutions needed to address critical regional and social gaps.
- Create a system of institutional differentiation and distinctiveness to cater to a diverse body of students and the varied needs of employers.

The special scheme, called Kasturba Gandhi Balika Vidyalaya (KGBV) is implemented within the SSA to provide residential facility to dropped-out girls at upper primary level. Over 2500 KGBVs have been operational and the interventions has created enormous interest and demand. A substantial increase is observed in case of upper primary schools which were 3,85,883 in 2005-06, increased by almost 52 per cent (5,89,796) in 2013-14.

- Use of transformative potential of new technologies to improve quality, reduce costs, improve processes and efficiency and reach a larger body of students, while promoting efficient and transparent governance and raising the quality of teaching and research.

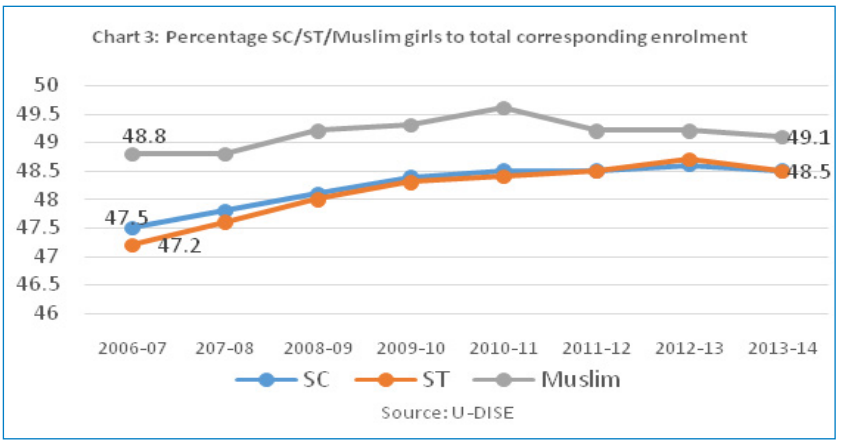
Early Childhood Care and Education (ECCE): At present, ECCE is the responsibility of Department of Women and Child Development (DWCD). However, in some states, pre-school facility is being provided by Education Department by opening pre-primary wing in the primary schools. As per Unified District Information System for Education (U-DISE) data of 2013-14, about 49 per cent government primary schools have pre-primary or *Anganwadi* facility. Although number of schools having pre-primary facility is much smaller (one third) as compared to *Anganwadi* facility which is about two third of total facilities. It is noteworthy that U-DISE reports information only on those Pre-primary or *Anganwadis* facilities which are available within or adjacent to the primary school. In case, the pre-primary or *Anganwadi* facility is located outside (and not even adjacent) the primary school, but in the same habitation/village, it wouldn't be captured in the U-DISE data. The pre-primary and *Anganwadi* facilities in primary schools have been increasing year on year, for example, within primary schools where pre-primary facility was available in about 10.9 per cent and *Anganwadi* facility was available in about 29.3 per cent primary schools which increased to 15.8 per cent and 33.3 per cent in 2013-14 respectively.

Access & Enrolment of children belonging to disadvantaged communities and groups:

Table 1: Percentage enrolment and population by social category

	per cent population share (Census 2001)	per cent enrolment share (DISE 2013-14)
SC	16 per cent	20 per cent
ST	8 per cent	11 per cent
Muslim	13 per cent	14 per cent
Source: U-DISE		

The enrolment trends of socially marginalised groups indicate the improvement as far as equitable access to education is concerned. The DISE data for the year 2013-14 suggests that the percentage share in enrolment of SC, ST and Muslim children corresponds with their percentage



share in population. The details of percentage enrolment and population are given in Table1.

Increase in the enrolment of girls was possible only with improvement in the enrolment of girls belonging to different social categories, particularly, SC, ST and Muslim[6]. Chart 3 presents the increase in enrolment of girls belonging to these social categories.

The share of SC, ST and Muslim students in enrolment corresponding to their share in enrolment does not mean that the marginalization of the communities does not pose a challenge to universal enrolment. Since SC and Muslims population have varying density at different places, therefore, despite a corresponding percentage share in enrolment many children belonging to these communities, still are out of school. Such a situation underlines the need for a greater focus on social access, equity and plurality besides quality improvement in the curricular and pedagogic practices.

Challenges:

Barriers to Access:

Majority of the out-of-school children belong to the disadvantaged communities: schedule castes, schedule tribes, Muslims, migrants, children with special needs, urban deprived children, working children, children in other difficult circumstances, for example, those living in difficult terrain, children from displaced families, and areas affected by civil strife. RTE Act casts the responsibility of specifying and notifying the disadvantaged groups and weaker sections on the state governments. While discussing the issue of social access and equity, the tendency is to confine it to broad categories like SC, ST, Muslims, girls etc. One has to appreciate that even these are not homogenous groups. The social realities are far too complex and there are groups within these groups, which for different reasons are much more disadvantaged. In order to fully meet the goal of universal access the next phase of programme implementation will need to address barriers to access arising out of the following social and economic realities[7]:

***Gender*:** Opportunity cost of girl's labour and early marriages continue to be serious challenges. This is aggravated by the fact of schools not being inclusive and safe spaces for girls. While schemes like KGBVs and NPEGEL have been successful, their reach has been limited in numbers. The larger education delivery system must respond to these barriers more effectively to retain the girls in the schooling system, after enrolment.

***Caste*:** to address this barrier, intense micro planning at the SMC level is required. RTE Act has put in place a legal framework of prohibited and mandatory activities to deal with these barriers; nonetheless substantial work will have to be done at the stage of social and school mapping exercises at the village level. The change in mind sets of the education delivery machinery about verbal references, assignment of work to children of different backgrounds and class room practices of equity is a serious challenge which teacher's training will have to address. The SSA Framework of Implementation has given an exhaustive list of exclusionary practices, and this will have to translate into actual behaviour patterns. Another challenge for this barrier would be setting up mechanisms of timely detection and quick redressal after the norms of behaviour are laid out.

***Ethnicity and Language*:** varies from open discrimination to just differences in physical and cultural scenario between the school and home. Differences in school and home language can lead to children dropping out as the children do not understand and cannot participate in class room interaction. This can be an insurmountable barrier to access.

***Disability*:** It is estimated that out of all CWSN, 34 per cent are out of school. The challenges for them are multiple - architectural barriers, inadequate provision of aids and appliances, resource support and curricular access.

***Displacement*:** Displacement arising out of seasonal migration, natural calamities, civil strife etc. acutely affects children from disadvantaged groups and weaker sections. Where displacement can be anticipated, for example through migration patterns, pre-emptive steps to establish seasonal hostels may be taken for schooling of children whose parents migrate during the social and school mapping exercise. Alternately, the receiving place may put them in Special Training with a view to future mainstreaming. The needs of children displaced on account of calamities – floods, earthquakes, civil strife etc. would need to be addressed in an appropriate manner.

***Age*:** Over-age or never enrolled children face an access barrier arising from a sense of humiliation in sitting with younger children. The RTE Act provides for Special Training for these

children to enable them to be admitted to an age appropriate class. The States will also have to work on an accelerated curriculum which would be transacted in the Special Training centres, and concurrently ensure that teachers are trained in the appropriate pedagogy.

Way Forward

School Education: Universal access and participation cannot be achieved instantaneously. It is a long and slow process. We need to continue full-steam ahead for improved physical access by creating and improving physical infrastructure. However, for improving social access, we need to engage more with the society to ensure that children from all strata are provided with education of equitable quality. Following pointers needs to be worked upon for school education after conducting a comprehensive diagnostic study:

- School and social mapping;
- Active involvement of community;
- Opening primary and upper primary schools;
- Providing Transport/escort facilities;
- Opening residential schools;
- Improving special training facilities for out of school children.

Higher Education: In near future, while opening new institutions, the focus should be on locations, States, subject areas, disciplines and types of institutions to ensure availability of all types of institutions are available in all regions. Capacity in the existing institutions should also be increased, wherever there is demand. An innovation in higher education needs to be encouraged and curriculum review should be conducted to ensure that the students in Higher Education Institutes are ready for the job market or self-employment. Creating a network of institutions will help addressing problem of lack of experienced faculty. Research in the area of higher education needs to be encouraged and financed by the government and private sector.

Endnotes

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Swachh Bharat Mission

E-Course on Capacity Building of Municipal Functionaries

The Swachh Bharat Mission (Urban) is a major initiative of the Ministry of Urban Development (MoUD), Government of India. While addressing the need for the capacity building, MoUD has introduced the e-course on capacity building of municipal functionaries. It introduces challenges and solutions in the field of urban sanitation to municipal functionaries who are at the forefront of delivering objectives of the Mission.

The e-learning platform aims to reach out to city managers and municipal functionaries of all 4041 statutory towns for their continued education. It provides flexibility to busy city managers and provides them options of choosing their own pace of learning. This platform will serve as a one stop hub with videos showcasing leading practices, technology options and peer to peer learning.

The e-course is divided into seven components in accordance with the Swachh Bharat Mission (Urban) Guidelines. To enable a thorough understanding of each component, these have been sub-divided into seven modules comprising of several tutorials.

Component 1: Introduction to Urban Sanitation in India (Course Series 100)

The modules will also talk about linkages of sanitation to other sectors such as health, environment as well as indirect links to poverty, social discrimination and education. This module will discuss the planning process for urban local bodies to achieve and sustain open defecation free status.

Component 2: Municipal Solid Waste Management (Course Series 200)

Session in this module will discuss in detail MSW generation, segregation, collection, transportation, sorting, processing, recovery and disposal. Tutorials will discuss concepts such as reduce, reuse and recycle (3R), zero waste, sound material cycle society and waste to energy. MSW management, design, finance and monitoring will be discussed at relevant stages.

Component 3: Individual Household Toilets (Course Series 300)

Sessions in this module will talk about barriers to access household toilets, challenges faced by Urban Local Bodies (ULBs) in providing toilets, analysis of past schemes for provision of individual toilets, financing construction of toilets, design standards, behavioural challenges related to use of toilets.

Component 4: Community and Public Toilets (Course Series 400)

Sessions in this module discusses the why and how of provision of community toilets. Tutorials focus on where to build, how to build and how to operate and maintain community and public toilets. Special tutorials will discuss leading practices and various financial models for constructions, operation and maintenance of public toilets.

Component 5 : IEC and Public Awareness (Course Series 500)

This module will discuss behaviour change communication and public awareness strategies to address issues of open defecation, prevention of manual scavenging, hygiene practices, proper use and maintenance of toilets, and its related impacts on health and environment.

Component 6 : PPP and Financing Sanitation (Course Series 600)

These modules will discuss strategies for successful public-private partnerships and financing for sanitation. The tutorials will include main benefits and limitations of the PPP procurement mechanism, and innovative and sustainable financing strategies.

Component 7: Other Relevant Modules (Course Series 700)

These modules includes aspects of sanitation which have either not been covered in the earlier components or which are cross-cutting. These will also introduce innovations and pilot projects which have the potential to evolve into standard practices in near future.

(Source: Ministry of Drinking Water and Sanitation)

Need For a Good Assessment System

Avtar Singh

...at primary stage, assessment, diagnosis, and remediation will go a long way in improving the system. Likewise, some kind of comparability across Education Boards in terms of syllabus, question paper format etc. must be established. Boards should integrate school assessment with external assessment to have a better profile of student achievement

Most of us are familiar with the terms Assessment, Evaluation and Examination but we rarely try to differentiate these. Rather, we use these interchangeably as the processes for awarding marks to students and classifying them into classes and categories and use them for certification and promotion. Among these, examinations are the one which are better understood because all of us have appeared in number of examinations in life. It is like a necessary evil. Even the brightest students fear the examinations because of the ambiguities, uncertainties and unreliability factors involved in them. These factors start from framing the question papers, administration of question papers, marking answers, tabulation and finally awarding marks to the students. There are a number of pitfalls in these examinations. These examinations are widely used to certify, rank and promote the students. These can make or mar the careers of examinees. Read inside the Box-1. Bullets one and two on basis of the research study conducted on the marked A/scripts of a national board. Bullet three was reported in the National Daily recently.

- In a board examination, a student re-writes the statements of questions in answer sheet. S/he secures 32 marks out of 70 marks in class 12 Science subject.
- A student writes answers to questions which he knew and very few of them were in the question paper. S/he secures 78 marks out of 100 in Social Studies in class 10
- A student of NIT is declared fail in one of the subjects in a semester. He commits suicide. When that paper got re- evaluated by his parents, he gets 48 marks out of 50. A precious life is lost due to wrong marking.

Assessment or Evaluation are more specific terms, focused on learning outcomes, diagnosis of learning difficulties and consequent remediation to improve learning. For instance, Continuous and Comprehensive Evaluation (CCE) was the concept to develop overall personality of the child and enhancement of learning to desired level before promoting to higher class. This was the main plank for implementing RTE Act, 2009. The

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Act ensures smooth completion of elementary education till class VIII of all children (6-14 years) stipulating non-detention or failing any student till class VIII. The vehicle to ensure this, while maintaining desirable educational standards was CCE. The whole concept of CCE was neither understood by the teachers, nor monitored during implementation by any agency.

For both students and teachers, it was a happy situation and the result is that students were completing elementary without acquiring reading, writing, mathematical and other basic skills.

The quality of education has suffered as indicated by the results of series of National Achievement Surveys (NAS) conducted by NCERT at different stages of school education. (Table-1).

The Present Scenario

A number of initiatives have been taken to revamp the present system but these measures always fall short of what is really needed. Efforts have also been made to have a good assessment system rather than the present examination system which is serving a limited purpose. There are a number of milestones in evolving the education system, starting with National Commission on Education-1968, National Policy on Education-1986 and National Curriculum Framework-2005. Each one of these have extensively delivered to make assessment a power tool for improving learning as well as the education system as a whole. Unfortunately, very few of the recommendations could be implemented so far and we continue what we have been doing over the years. More reforms have been introduced in school education sector than higher education because of the need to make the foundation stronger.

The quality of education in school sector or in higher education sector is an issue today. All our efforts through SSA, RMSA or RUSA may not yield the desired results because 1) these programs are implemented half-heartedly 2) the system has expanded 3) there is acute shortage of teachers at all stages. The expansion has more political reasons but the poor quality of teachers is the product of our present examination system. Today, we have more than 15 lakh schools, 35,000 degree colleges, 4500 technical institutes and about 660 universities etc. Then there are more than 40 School Education Boards, merely conducting examinations to declare students pass or fail. Besides examinations, the boards can play a better role by focusing on teaching learning. Thus, there is a vast education system in which examinations guide the teaching learning process. Teaching and testing should be integrated like two faces of a same coin.

Table-1
National Average Percent Score of Students of Class VIII in Different subjects

Subjects	Language	Mathematics	Science	Social Studies
Cycle-2	56.57	41.30	37.78	44.15
Cycle-3	46.20	3.28	36.37	38.34

Source: National Achievement Survey of NCERT Cycle -2 (2006-08) and Cycle-3 (2011-13)

Table 2:- Mean Score in PISA 2009 Cycle

AREA	Brazil	Tamil Nadu	Himachal Pradesh	OECD Average*
Reading	412	335	314	493
Mathematic	386	350	338	496
Science	405	347	326	501

*These are average scale scores on a scale of 0 to 700 points

The Shift Needed

We have been using Classical Test Theory(CTT) in all our measurements and assessments which have inherent limitations. It does not serve any purpose beyond certification. The modern testing methods have more scope in improving the testing and system over a period of time. Item Response Theory (IRT) is being used in all international studies like Program for International Student Assessment (PISA), Trends in Mathematics and Science Studies TIMSS) and Progress in International Reading Literacy (PIRLS). The advantage of IRT is 1) it assesses the true ability of students irrespective of the difficulty of tests 2) uses multiple tests to have more number of measurements points 3) identify the strengths and weaknesses each item/concept and 4) compare students, real achievement over longer periods to gauge whether the system is improving or not improving. Two initiatives that have been taken in this direction are mentioned below.

1) India participated in PISA 2009+ cycle[1] in 2010-11 by piloting PISA tests in two states; H.P. and Tamil Nadu with the objective of participating, understanding the process and seeing how our students respond to the type of questions which are specific to 16 years of age and does not cater to any specific course content. 74 countries participated in this study and our states fared next to Kyrgyzstan from the bottom. The results were on expected lines and should have been taken as a starting point for further international participation. PISA has become extremely influential to respond whether students have learned the ability to analyze, reason and communicate

effectively and able to apply these skills in adult life. Many countries have been participating since first cycle in 2000, and their poor performance has proved that it is not a powerful tool in improving their schools and the system as a whole. The case of Brazil is an example to be quoted that had similar score in 2000 but continued to participate in PISA and improved its performance. (See Table-2)

At the national level, NCERT has made a beginning to make assessment of learning levels of children across the country on sample basis. Under SSA, baseline, mid -term and terminal studies were carried out to map the progress in learning levels as a result of various inputs provided in schools under SSA. Gradually, these measurements have been graduated to adopt IRT model in the terminal studies (Cycle-3) onward. These studies are now able to provide 1) item wise performance in each subject 2) identification of grey areas/ misconcepts in each subject and 3)overall Systemic Quality Index (SIQ) whether the system is improving. This is almost a regular activity and Cycle-4 is in progress. There is a need to strengthen this initiative and make use of the enormous data available for improving the education system. The states/UTs are active partners in this venture and have initiated similar state-wise studies. States are being provided a hand holding support by NCERT.

The Way Forward

We need effective implementation of Assessment system covering three broad areas.

At the initial school stage, understanding and use of Language (any language) is the most important. Reading, writing and speaking are abilities to be developed, assessed and improved, otherwise it remains a big barrier facilitating dropouts, failures and poor interest in learning. Similar is the situation in Mathematics. Understanding and interest in these two subjects generally has a high correlation with success in career. Therefore, at primary stage, assessment, diagnosis, and remediation will go a long way in improving the system. Likewise, some kind of comparability across Education Boards in terms of syllabus, question paper format etc. must be established. Boards should integrate school assessment with external assessment to have a better profile of student achievement.

There are a large number of colleges, universities and other institutions having different types of examination systems but rarely a good assessment system. The outcome of the system is, by and large, of very poor quality. This is evident from a recent survey of BRICS[2], where none of our institutes figures in the first 15. Only Indian Institute of Sciences, Bangalore figured at 16th position among 200 Institutes. A comprehensive system comprising of internal assessment, tutorials, presentations, projects and external assessment reflecting what a student has actually achieved, must be reflected in the certificate/ portfolio on completion of the degree. UGC has recently initiated a credit –grade system to improve the quality and provide flexibility within the system.

With all experimentation, innovations and reforms, there is no 'health check'to tell us whether the health of the education system has improved or deteriorated. Is the new generation more knowledgeable and skillful? Also, there are multiple institutes engaged in conducting entrance examinations. To address these issues, we need an organization like Education Testing Service (ETS) Princeton, New Jersey, U.S. which should take care of above mentioned functions and also undertake longitudinal research studies. The NPE-1986 has recommended the establishment of a National Evaluation Organization (NEO), but it has remained only at the discussion stage.

Endnotes

1 PISA 2009+ was re-run for countries who could not participate in of PISA 2009. The countries were; Costa Rice, Georgia, Malaysia, Malta, Mauritius, Venezuela, Moldova, UAE, India (H.P. and T.N.)

2 The Times Higher Education BRICS and Emerging Economies 2016-Ranking ❑

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Education, Research and Development: Linkage to "Make in India" Mission

Ashok Jhunjhunwala

R&D, Design and Product Development, IPR creation and preservation, in addition to Manufacturing will contribute significantly to "Make in India" Mission. This will enable it to achieve its twin objective to not only employ a large number of people in India while it consumes more and more of these products, but also ensure that India's Import bill does not sky-rocket. Improving the quality of Technical Education and initiatives like that of IITM Research Park need to be strengthened significantly for us to achieve these objectives

India has embarked on a Mission for "Make in India." The objective is that its large population does not depend on more and more imports as its industrial consumption increased as a result of economic development. At the same time, the Make in India Mission is expected to create large employment that the country needs as significant percentage of its population shifts from agriculture. Over the last twenty years, as its economy grew, India has become increasingly dependent on imports for all kinds of goods it consumes. On one hand, it has massively increased its import bill and on the other hand, the growing economy has provided little in industrial employment for its population. This needed correction.

Fulfilling 'Make in India': Critical Elements

However as we focus on manufacturing, we need to take a more careful look at what kind of manufacturing would meet these objectives. There are different contributions to the value add in taking one of the most successful product in the world today, the I-phone, to its consumers. Note that out of the typical consumer cost of USD 500 for an I-phone, only USD 7 is contributed to manufacturing. USD 174 is contributed by components and subsystems and a whopping USD 321 by Design and IPR as well as sales and distribution. Assuming 50 per cent of USD 321 is due to design and IPR, their contribution would be about 23 times that of final manufacturing. Even though the example here is that of an electronic product and it may not be as applicable to other products, there is little doubt that design and IPR contributes significantly to the overall costs of any product today. In other words, it is important to include design and IPR generation as well as manufacturing in Make in India Mission, so that the twin objectives discussed above are met. Only then the value add in India would be significant for the products it consumes and reduce the import bill. And only then will it employ a significant number of Indian people in "Make in India" program.

Leveraging India's Design Capabilities

Fortunately, over the last thirty years, India has made a good beginning in designing of products. A significant percentage of the world's design work

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takes place in India today; however it is largely carried out as service work for multinational companies. All these companies have their captive design-centres in India today; besides there are Indian companies, which provide design services to these companies. As a result, even though significant design works gets carried out in India, it does not result in Indian-owned IPR and Indian products. India's capabilities do not extend to making and commercialising the products. This would require confidence, investments, ability to market products in India and globally and compete with the best anywhere. The only exception, to a limited extent, is in strategic sectors like defence, space and atomic energy, where the design work sometimes gets translated into products.

The products developed in India could leverage home-advantage for early-trials and feedback; however it must be pointed out that blind-protection[1] from imports only makes the consumers consume lower-quality and higher cost products. India has to build high-quality products which can compete with the best in the world. The Indian R&D community must deliver on this. The Indian business-leaders have to drive these products into market and build profitable ventures. The government must enable this, with policy encouraging such product-development and removing all the barriers that such industry encounters.

India's Weakness Today

India has established itself as designer over the last thirty years.

Back in early eighties, India barely had 100 engineering colleges, producing less than 20,000 engineers every year. Middle-class Indians had nowhere to go as their bright daughters and sons wanted to study engineering, but were denied opportunity. It is in mid-eighties that India started opening private engineering colleges. It continued to expand in nineties. In the first decade of the 21st century, while new private colleges continued to be set-up, Government colleges added to the momentum. There were only six IITs not long back. Today, there are over twenty. There are 30 NITs. IIITs, ISERs and NISERs have come up. Significantly, more money has gone into higher education, especially the engineering education. Today the number of engineering colleges has exceeded 4000 and the number of students admitted to undergraduate engineering program is touching 1.5 million every year. While a definite mark has been made in terms of quantity, so has been in terms of equity. Nearly 25 per cent of those admitted to these colleges are believed to be from below poverty line and 25 per cent are students form rural areas. But as the quantity and equity got addressed, quality was left behind. As one move away from IITs and a few other engineering institutes, the quality drops rapidly. Recently, MHRD has taken several initiatives (including setting up of a committee called "Quality Enhancement in Engineering Education") towards this. There is some determination that the quality should be fixed over the next ten years. Leveraging of ICT towards direct to student teaching as well as teacher-training is envisaged.

One of the tasks towards "Make in India" mission would therefore be to significantly improve quality of these colleges, so that its graduates are able to contribute to a significant extent. All kinds of skills need to be developed so that graduates are ready to participate fully in Research & Development, IPR Creation, designing, developing and testing of products, mass-manufacturing and commercialising. MHRD needs to take leadership here.

This expansion of engineering colleges laid the foundation for design services industry in India. Even-though the quality of these graduates was not high (largely due to deficient teacher-quality in new colleges), design and service industry could hire and train these youngsters. The salaries were higher than in other industry and the youngsters flocked to it. Given the right working condition, they worked hard to overcome their quality deficiency. In a few years, they were reasonably good. As the industry matured, the services carried out by the industry expanded and graduated to higher end design services.

Unfortunately, this did not result in India owning and commercialising products. The design work was done entirely as services work. There were occasional products, but they did not sufficiently catch the imagination and captured significant market in India or elsewhere. In the meanwhile, as India's economy grew, its burgeoning middle-class was becoming a huge consumer of industrial products. Most of these are imported. No wonder that India's import bill for these good & has been growing rapidly.

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Value-add and Product-industry in India

As discussed in the beginning of this section, the value-add in products could come from:

a) Design, Development and IPR (including software);

b) Brought-out components and sub-systems;

c) Packaging;

d) Manufacturing (including assembly and testing);

e) Sales, marketing and commercialisation.

Let us examine where India is in each of these areas. Component industry in India is weak as of now. Many of the components need to be often imported. The cost of these components depends a lot on volume. Unless the production takes place in high volumes, component prices will be high. The reason why component industry is weak in India is because the product design and marketing locally is weak.

Manufacturing used to be weak and expensive in India a decade back. But thanks to the policy of getting telecom handset companies to manufacture in India, a significant assembly industry emerged. The auto-industry and electronic-industry are two of the examples. India is ready to carry out its own manufacturing. It has also helped some component industry in India to strengthen itself.

As discussed earlier, the key value-add lies in Design, Development and IPR. India has the capability. It has to be harnessed by business. The government has to create the right environment and business and R&D personnel have to build a product industry.

India's IPR Capability

Let us first discuss India's IPR creation capability. The Indian academia, lead by IITs, do have faculty and research scholars who are capable of creating IPRs. The number is not many, but is growing. There are many personnel in industry who can participate. Leadership is however needed. Indian academia is too content with R&D towards publishing. They do not yet see the importance of IPR creation or how individual IPRs would contribute to product development.

To enable to overcome this barrier, the Indian R&D personnel needs to be connected to technical bodies which debate and formulate draft standards for any product. It is this process which deals with identifying gaps and IPR contributions which fill these gaps. Once the contribution of an IPR goes into a standard, its value significantly increases. Every commercial venture which will make products as per that IPR would have to negotiate with those who own the IPR.

In most countries, there are standards development societies, which link the R&D personnel capable of creating IPRs to the international standards efforts. These societies, while supported by government, are lead by industry / academia consortium. Societies with only such constitution are welcome by International standard making bodies. Korea, China, Canada, Japan, Europe, all have such societies focused on telecom standard development. Only in November 2013, a Telecom Standards Development Society of India (TSDSI), has been created with the support of Department of Telecom. Hopefully, this body will help Indian R&D community to move faster in this direction. However, TSDSI will focus only on telecom. Such efforts need to be extended beyond telecom. Smart-grid forum of India is another step in this direction. IEEE in India now has been playing a role in creating academia-industry forum to work on standards. Low-voltage DC (LVDC) forum is one such forum. The efforts need to be multiplied multi-fold. Government should have a policy to support (financially and otherwise) such efforts and refrain from trying to control them.

The combined strength of those in design-services companies, public sector labs, captives in multinationals designing products and those in start-ups is substantial. This would be the major asset if India has to become product companies.

IPR creation and driving them to standards will require Indian academia and industry to work together. Such industry-academia linkage are still of tenuous nature. They need strengthening.

India's Design and Development Capabilities and Product Eco-System

The Indian academia has not made any major contributions in Design and Development of electronics and ICT products. However, they certainly have the knowledge and potential. They would however rarely take the lead. They have the capabilities and need to shift the focus from basic R&D a bit towards translational research. The universities and institutes need to encourage this.

Then there are various R&D Labs in the country like CDOT, CDAC and some CSIR Labs, some DRDO Labs, some Labs associated with Atomic Energy department and others associated with space department. These Labs do indeed make some products in their niche sector. But they have rarely contributed to products which could have large commercial success. The personnel in the labs are indeed capable; however they would need a complete reorientation to be part of commercially successful product development (even if the product is for strategic sector).

Then there are R&D personnel in some public-sector industries. BEL, ECIL, BHEL and ITI would be the major ones, though such R&D personnel would be there in many smaller companies. They have worked for some internal needs of the organisation or on some Government and defence sponsored products (Electronic voting machine is one such example). However, they have rarely contributed to major products which have had major commercial success. Reoriented to focus on commercial products, many of them can play a role in developing products.

The experience of product–development in this sector lies with personnel in private industry. However, most of them have carried out design and development as services to multinationals. At times they have worked in captives (Indian subsidiaries of multinationals), where the control of the product design and development is mostly outside India. Then there are start-ups and young companies, where they indeed have designed, developed and commercialised products. But the numbers are fewer here. The combined strength of those in design-services companies, public sector labs, captives in multinationals designing products and those in start-ups is substantial. This would be the major asset if India has to become product companies. One of the Indian companies came up with a slogan, "We carry out twice as much R&D at half the cost of the West." This has the basis of translational research and development towards product development in India.

Then there are incubators. Department of Science & Technology, Government of India, has taken an initiative to set-up university-based technology incubators through NTTEDB. About 100 such university-based incubators exist. Many of these incubators have been highly successful in creating an eco-system where product-start-ups are nurtured. The interest amongst young and bright Indians is only growing in this direction and likely to flower-up in coming years. Department of Bio-Technology has taken similar initiative to promote start-ups in universities now. There are Entrepreneur forums and alumni-organisations ready to pitch-in.

The start-up eco-system is really blooming in India today, lead by the start-ups in some of these university incubators. The important thing is that the best students of the top institutions are now opting to get into start-ups rather than go abroad for a higher degree or get into high-paying finance jobs. Secondly, a significant part of these start-ups, at least IITs are engineering start-ups. Some of the companies are achieving mind-blowing results, which could not even have been imagined a few years back. As discussed later, the Research Parks and academia-industry collaboration is fuelling such endeavours.

University-Associated Research Parks: IITM Research Park, A Pioneering Example

An important component of the eco-system to make India a nation which design, develops, owns, manufactures and commercialise products, will be University-associated Research Parks (RPs). These RPs could take the industry-academia interaction to a new height. Located adjacent (within cycling distance) of an academic institute, the Park is to invite industries to set their R&D there and drive the R&D in collaboration with the institute's faculty, staff and students. It is the three set of people, a faculty, and experienced industry person and a youngster, interacting with each-other intensively in a formal as well as informal environment, which results into innovation. The faculty has the knowledge-width, an experienced industry-personnel knows how to convert idea into viable product and a youngster (student) does not know that it cannot be done. Academia already has the two of these elements. When the industry sets up its R&D in the Park, the triad becomes ready to deliver. Such Parks have played an important role in strengthening industry-academia interactions in Europe and in USA. They also house the newly incubated companies, which contributes to make the Park as an innovation hub. IIT Madras has already set up the nation's first Research Park, known as IITM Research Park (IITMRP). Its first tower of 400,000 sqft houses over 50 companies and about thirty Start-Ups today and is full. With only three years of existence, it has already become an innovation hub, where product development is in full-steam. Today it is adding another 800,000 sq ft of space, which would be ready by

the end of 2015. In about two years, it should have 150 companies doing R&D in collaboration with IITM and another 150 start-ups, incubated by IIT Madras. The Park also houses some Public-Private Research Labs, where the Government has put in initial investment to start R&D, but significant contribution (and sometime the leadership) comes from companies.

One of the important feature of IITMRP is that a company which takes space at the Park has to do a minimum amount of measurable R&D in collaboration with IITM. For every square feet of area that they rent, their lease-contract requires that they earn certain number of Research credits from IITM. The research credit is earned only when they do a certain amount of measurable R&D with IITM. This is the first time such a feature has been introduced in a Research Park. It pushes the tenant company and its personnel to engage with IIT for R&D. This little push is enough to get the barriers between academia and industry broken. Once the company tastes a fruit of such a collaboration, it is able to understand the benefit and its collaboration far exceeds the minimum number required.

The Research parks also houses the incubators and the start-ups. It is this eco-system that is harvesting the engineering start-ups.

Another aspect of IITM Research Park is its financial model. The total cost of the fully-built Park may cross ₹450Crore. MHRD has provided a grant of ₹100 Crore to build it. The rest of the funds have been generated by IITMRP by itself. Some of it has come from bank-loans at commercial interest, while others have come as lease-advances obtained by IITMRP from its clients. Even the alumni have contributed a bit; however the amounts are very small. The Park is an independent Section 8 Company, and has been able to make itself financially viable in a short-span of five years.

The IITM Research Park has however barely began its work. Over the next five years, at least ten such R&D Park needs to be established. MHRD has already provided grants of ₹100 Crore each to IIT Bombay and IIT Delhi towards the Park. Several more will be added soon.

The next step would be to enhance the quality of R&D at each of the Research Parks and ensure that plenty of Indian products emerge from such Parks. These products could come from the tenant companies or from start-ups or from the public-private R&D Labs set up in the Park. The success of IITMRP would however multiply, if successful commercialisation and scaling up of the products take place.

To Sum-up

In other words, there is capability and there is a young eco-system towards India becoming product development leader. R&D, Design and Product Development, IPR creation and preservation, in addition to Manufacturing will contribute significantly to "Make in India" Mission. This will enable it to achieve its twin objective to not only employ a large number of people in India while it consumes more and more of these products, but also ensure that India's Import bill does not sky-rocket. Improving the quality of Technical Education and initiatives like that of IITM Research Park need to be strengthened significantly for us to achieve these objectives.

Endnotes

[1] It should however be emphasised here that Government must address the unfair advantages that an imported product often gets as compared to Indian products. This include discrimination against Indian products in taxes, higher-interest rates on finances, difficulty in obtaining working capital, disadvantages in terms of infrastructure (for example poor electrical power availability) and the mind-set which often assume that imported product will be inherently superior. ❑

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Joint Initiative for Research in Technology Challenges Launched

'IMPRINT India', a Pan-IIT and IISc joint initiative to develop a roadmap for research to solve major engineering and technology challenges in ten technology domains relevant to India was launched recently.

The objectives of this initiative are to (1) identify areas of immediate relevance to society requiring innovation, (2) direct scientific research into identified areas, (3) ensure higher funding support for research into these areas and (4) measure outcomes of the research effort with reference to impact on the standard of living in the rural/ urban areas.

IMPRINT India will focus on ten themes with each to be coordinated by one IIT/IISc, namely:-

(a) Health Care - IIT Kharagpur, (b) Computer Science and ICT – IIT Kharagpur, (c) Advance Materials – IIT Kanpur, (d) Water Resources and River systems – IIT Kanpur, (e) Sustainable Urban Design – IIT Roorkee, (f) Defence – IIT Madras, (g) Manufacturing – IIT Madras, (h) Nano-Technology Hardware- IIT Bombay, (i) Environmental Science and Climate Change – IISc, Bangalore and (j) Energy Security – IIT Bombay.


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Pradeep Kaul

SWAYAM...will provide one integrated platform and portal for online courses, using information and communication technology (ICT) and covering all higher education subjects and skill sector courses to ensure that the every student in our country has access to the best quality higher education at the affordable cost

The Cabinet on 2nd January 2009 had approved 'National Mission on Education through Information and Communication Technology' (NMEICT), a Central Scheme of Ministry of Human Resource Development (MHRD), to leverage potential of ICT in providing high quality personalized and interactive knowledge modules over the internet/ intranet for all the learners in Higher Education Institutions in anytime any where mode.

The three cardinal principles of Education Policy viz., access, equity and quality could be best achieved by providing connectivity to all colleges and universities; providing low cost and affordable access-cum-computing devices to students and teachers; providing high quality e-content free of cost to all learners in the country and providing content to learners to homes via DTH. NMEICT encompasses all the three elements.

As per 'Digital India' Initiative, under Pillar 5, Electronic Delivery of Services, the thrust areas is to include 'Massive Online Open Courses (MOOCs)' that shall be developed and leveraged for e-education by MHRD. Government of India is emphasising on the use of ICT for education in a big way. Ministry of HRD, has accordingly embarked on a major and new initiative called 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM), which will provide one integrated platform and portal for online courses, using information and communication technology (ICT) and covering all higher education subjects and skill sector courses to ensure that the every student in our country has access to the best quality higher education at an affordable cost.

SWAYAM is an indigenous (Made in India) IT Platform for hosting Massive Open Online Courses (MOOCs) with a capacity to revolutionise the education system by providing best quality education using the IT system to students, even in the remotest corner of the country. It is intended to make available quality education to every citizen and bridge the digital divide; expecting on an average 10,000 learners benefiting out of conduct of one on-line course, the MHRD intends to produce and deliver about 2000 SWAYAM courses per year, therefore tens of millions of students across the country shall benefit from the scheme in the most cost effective way. SWAYAM is expected to operational in May 2016.

SWAYAM would provide

1. High quality learning experience using multimedia on anytime, anywhere basis.
2. One-stop web location for interactive e-content for all courses from School to University level.

The author is senior consultant, NMEICT and Coordinator, DTH, Ministry of Human Resources Development, Government of India.

3. State of the art system that allows easy access, monitoring and certification.
4. Peer group interaction and discussion forum to clarify doubts.
5. Hybrid model that adds to the quality of classroom teaching

Work Done So Far

Besides creating fresh MOOCs courses, where such content is not available, the MHRD is utilising the e-content sanctioned to institutions and repurposed to MOOCs:

a. **Consortium for Educational Communication (CEC)** is coordinating creation of e-Content for 87 non-engineering undergraduate courses. This involves producing more than 26,000 modules. The e-content developed is MOOCs compliant.

- CEC is maintaining 17 Educational Multimedia and Research Centres (EMMRCs) equipped for generating e-Content. Each EMMRC is equipped with all necessary equipment and production staff required to produce e-Content. Working at optimum level, these EMRCs can generate 5,000 modules per year.
- CEC has so far readied MOOCs compliant e-Content for 29 subjects consisting of about 8948 modules. They have another 17,000 modules to develop further.

b. **UGC** is coordinating the creation of e-Content for 77 non-engineering post-graduate courses involving more than 45,000 hours of electronic instruction. The e-content developed is MOOCs compliant. So far, they are ready with 7 courses with 2,300 modules.

c. **NPTEL** is coordinating creation of e-Content for engineering courses. So far, e-Content for 922 engineering courses has been created. Of these, 93 courses have been delivered in MOOCs format and are having enrolment of 3.7 lakh students.

d. **NIOS** has already created e-Content for all the non-language courses for Class 10 in the Open School. e-Content for all courses for the Class 12 and basic language courses is being taken up.

Hosting the e-Content:

NIC has been requested to configure a Cloud, which can support 3 Crore users with a 10 Lakh concurrent connections. CDN system is proposed to be used to deliver the video content so that the system would be geared up to meet the massive demand for e-Content.

Creating the Content:

The following types of content shall be prepared with the best teachers in the country, using the multi-media techniques covering the following:

1. Curriculum based course contents covering diverse disciplines such as arts, science, commerce, performing arts, social sciences and humanities subjects, engineering, technology, law, medicine, agriculture etc. in higher education domain (all courses would be certification-ready in their detailed offering).
2. School education (9-12 levels) modules and teacher training as well as teaching and learning aids to children of India to help them learn subjects for better preparedness for competitive examinations for admissions to professional degree programmes.
3. Skill based courses which cover both post-higher secondary school skills that are presently the domain of polytechnics as well as industrial skills certified by the sector skill councils of various Ministries.
4. Advanced curriculum and professional certification under a unified scheme in higher education domain that can be tailored to meet the demands of choice based credit system (CBCS) currently being implemented in India.
5. Curricula and courses that can meet the needs of life-long learners of Indian citizens in India and abroad.

Duration of the Courses:

1) Courses in any one of the following formats:

a) 6-10 weeks in duration for shorter courses;

b) 12-16 weeks for CBCS programmes with faculty/mentor support from participating institutions/affiliations;

c) 30-40 hour courses to be taken by University students and others for a designated number of credits;

d) Skills-certification whose duration is domain-specific and ranges from 4 to 10 weeks;

e) Courses specifically targeted to teacher training and teacher development.

2) 2-3 hours of lectures/supplementary reading per week

a) The lectures are broken up into short modules

b) Every module has a clear description of its contents and expected learning outcomes.

3) Objective-type assessments every week (to be auto-graded or assisted by Teaching Assistants (TAs)/ Mentors as the case may be)

4) Longer and more extensive assignments, two or three in number and discussed extensively in the course discussion forums.

Maintaining Quality of the Content

Faculty who volunteer to conduct an online course will be awarded under SWAYAM to design the online course curriculum from model curricula that exist already. Where the course is new, a team of experts will arrive at a suitable curriculum.

The following is the protocol for creation of content:

1. Selection of the best teacher in the Country to work as the 'Principal Investigator' or 'Subject Matter Expert (SME)'.

2. Each PI/SME will identify his team of teachers with proven abilities and allocated modules to them.
3. The selected teachers are trained in a Workshop on the modalities, the quality standards for recording, which include:

a) Defining the Course outlook, pre-requisites and expected outcomes;

b) Splitting into weeks and short modules;

c) Preparing quizzes in the middle of each lecture for self-testing;

d) Weekly assessments and assignments;

e) Discussion forum that would answer questions online;

4. The team prepares the content, which will be reviewed by the PI/SME. This may involve repurposing the e-Content created elsewhere.
5. Studios are allocated for recording and for creating multimedia for the course. Each module normally takes a week to prepare.
6. The content created is previewed by experts and certified.
7. Course is scheduled. Once the course has started, based on the user feedback, the curriculum and pedagogical aspects will be reviewed periodically to correct all possible shortcomings.

Running of Courses

The role of the SMEs does not end with content creation. The SME team (assuming there are more than one for a particular course; the team could have a single SME as well, in exceptional cases) plays a crucial role in the conduct of the course on the portal. It is expected that the SME team will be assisted by a group of TAs provided by the SME team's department at their institute.

Course Announcement

Once a course is ready, it will be announced on the portal and learners will be allowed to sign up for the course.

Forum

An important duty for the SME team and TAs during the running of the course is monitoring the forum. The discussion forum on the portal tends to be very active and numerous questions are posted in it on a daily basis. Frequently Asked Questions (based on the SMEs' past experience) shall be posted along. **The SME team and TAs will need to respond to the questions every day.** In addition to the forum, questions from the email lists (announcements and forum discussions) and from the email address coursename@swayam.ac.in (a suggested e-mail service which may be used as a general contact email for the course) **will have to be answered promptly**.

Certification

One successful and highly scalable model adhered to by most service providers of online courses is to offer the contents for free and open access but charge for the service of proctored examination. This practice will be followed in this programme until such a time new policy announcements are made. A certifying body for each discipline will be created by HRD with the help of participating institutions. It is recommended that the Institutions which offer the course will all follow a general requirement and issue certificates with their names and the SMEs on each certificate with SWAYAM explicitly appearing on the logo of the certificate and the Ministry's support to the project and guidance being endorsed.

Conducting the Exam

About 1000 Centre shall be established to conduct SWAYAM exams across the country. The faculty will have to create at least one question paper for the mock exam and one or more equivalent examination papers for the final certification exams.

Announcement

If certification is being done, this needs to be announced along with the announcement of the course in the portal. The dates for the certification exam, the centers and cost need to be decided at the time of the course offering.

Efforts must be made to include industry or industry bodies as partners in the certification process. This creates important added value for the students. Wherever possible, education and R & D team members from the industry need to be included in the design of course contents and problem sets.

Repurposing the e-Content & New Efforts

It is proposed that all courses from School level to the Post-graduate level would be provided as e-Courses with interactive e-Content available free of cost on Internet. When completed, it would bring in interactive e-Content on MOOCs format of more than 2.5 lakh hours which would make it the world's biggest repository of interactive electronic learning resource under a single window.

New Efforts: All the Universities and Institutions have been invited to participate in the effort to create MOOCs. There has been an overwhelming response and MHRD has received proposals for creating about 1000 courses.

The Courses shall be sanctioned and funded to Institutions so that the work on creating the new MOOCs would begin right earnest. Apart from these, efforts would be made to coordinate the work of independent agencies working in the field of fine arts, vocational courses etc. and make them available through the SWAYAM.

Certification:

Each of these e-Courses would be followed by assessment consisting of quizzes, assignments and end-examination, which would be proctored. The exam fee would vary from Rs. 500/-to Rs.1,000/- based on the subject to be tested. On successful completion of each course, the institution offering the course would issue the certificate, through which the student can get credits transferred into his marks certificate issued by his parent institution. This process is currently under finalisation with UGC and AICTE. ❑

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DO YOU KNOW?

The EFA Development Index

(EDI) is a composite index brought out in the Education for All Global Monitoring Report, produced by UNESCO every year. It assesses the progress towards the goal of basic education for all children and adults by 2015.This Index uses four of the six EFA goals, that are selected on the basis of availability of data. These four goals are 1. Universal Primary Education (UPE) 2.Adult Literacy 3.Quality of Education and 4.Gender Parity. Each EDI component is given equal weightage in the overall index.

For each of the four EFA goals, one indicator is used as a proxy measure. For Universal primary education, the indicator is the primary adjusted net enrolment ratio (ANER), which measures the percentage of primary-school-age children who are enrolled in either primary or secondary school. Its value can range from 0 to 100 per cent. An ANER of 100 per cent means that all eligible children are enrolled in school.

For Adult literacy, the adult literacy rate for those aged 15 and above is used as a proxy to measure its progress. For Quality of education, the survival rate to Grade 5 is the best available proxy for assessing the quality component of EDI. Lastly, for Gender, a simple average is taken, of the three gender parity indexes (GPI) for primary education, secondary education and adult literacy, with equal weightage given to each.

The EDI value is expressed in percentage, thus, can vary from 0 to 100 per cent .When expressed as a ratio, it can range from 0 to 1. The EDI value for a given country is thus, the arithmetic mean of the four proxy indicators. The higher the EDI value, the closer the country is towards achieving the goal of Education for All.

SARANSH

Saransh is an online platform for a comprehensive self-review and analysis of student's performance and progress. It is a digital interface portal offering a one-to-one interaction platform between teachers and the parents of their students. It works on a data-driven decision support system to help parents in evaluating the strengths and weaknesses of their children and make them better informed about the child's likes and dislikes in turn enabling them to take informed decisions about their future.

Saransh has been recently launched by the Ministry of Human Resource and Development as one of the many digital initiatives under 'Digital India' campaign, to promote information and communication technologies in CBSE affiliated schools and bring transparency in the existing educational system in India. It also provides information regarding competitions and attendance, that can now be directly shared with parents through this digital platform. It also makes available the e-books of all standards and subjects. The schools can use this tool for analyzing subject performance of all students and and identify the fields where the child needs improvement. The portal is equipped with 3 preceding years' data of all schools. Hence, a comparative study, like year-on-year, can be done to find the well-performed areas of the student and fields that further needs to be improved. ❑

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India's Ranking in Global Innovation Index

"The Global Innovation Index" (GII) is a publication brought out by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO) as co-publishers, and their Knowledge Partners. The Confederation of Indian Industry (CII) was their knowledge partner from India for the year 2015. India's position in the GII rankings during current year and last three years is as under:

Year	2015	2014	2013	2012
India's Ranking	81	76	66	64

The Global Innovation Index (GII) 2015 covers 141 economies around the world and uses 79 indicators across a range of themes. The rankings are based on data collected during earlier years and thus do not truly reflect the status in the country in 2015. The Report itself identifies India as the top economy in GII rankings in Central and Southern Asia and also as one of the middle income group countries which is narrowing the gap in the innovation quality due to improved quality in higher education institutions. The GII 2015 report states that over the years, India has developed a stable foundation for scientific, technological, and business education by setting up centers of excellence such as the Indian Institutes of Science (IISC), the Indian Institutes of Technology (IITs), and the Indian Institutes of Management (IIMs). The Report acknowledges that India has leapfrogged, leaving others in its category behind, in areas like mobile networks, information technology, and broadband. This revolution in communications has affected a pace of knowledge creation and dissemination in the economy that is unprecedented in Indian history. It has helped to transform innovation-driven entrepreneurship from the point of aspiration to the point of reality for the people of India.

The Psychological Challenges in Educating Adolescents

Jitendra Nagpal

Life skills help adolescents to make informed decisions, solve problems, think critically and creatively, communicate effectively, build healthy relationships, empathize with others and cope with and manage their lives in a healthy and productive manner. Such knowledge and skills can lead to behaviours that prevent disease and injury, foster healthy relationships and enable young people to play leadership roles

The word 'education' means different things to different people. At its most reductionist but widespread understanding, education means attending regular school, learning academic curriculum, getting grades, attaining a formal degree which will ultimately permit and certify one as capable of joining the productive work force as an engineer, doctor, business professional etc. From there, one walks on to the path of success. Over the years, definition of education has evolved. This evolution is well reflected in words of Mark Twain "I have never let my Schooling interfere with my Education"

Schools are no longer expected to teach reading, writing and spelling. Any good school in today's era prides and distinguishes itself from its competitors by providing students opportunities for developing skills in the context of performance, strengthening their various qualities, enabling them for better decision making, handling conflicts and empowerment.

"Education is a creation of choices, making people aware about those choices and enabling them to make use of those choices". In keeping with this broad philosophy, schools are changing the methodology of teaching, embracing technology, attempting to transact challenging and interesting curriculums which facilitate learning attitudes and skills in learners. There is a corresponding shift in the assessment and evaluation process from factual rote learning and parroting to judging conceptual understanding and application of knowledge.

As education systems expand, one must bear in mind that the end user, the student, has also evolved. Students are no longer *'tabula rasa'* who used to rely solely on the teacher's knowledge and the prescribed text books. Schools are no longer temples of knowledge and they face stiff competition from the Internet. Today's learner has vast access to information and while the teacher helps in making sense of this information, he/she is not seen as the exclusive source of knowledge. Teaching must evolve into facilitating. This holds true even more as children turn into adolescents and from primary to middle school.

Adolescence marks the period of transition from childhood to adulthood. There are two primary tasks

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of adolescence, development of an individual identity and the capacity for intimacy. The formation of an identity in adolescence entails becoming a person in one's own right. From birth, the adolescent has been collecting various aspects of his or her personality. These include identifications with parents, friends, influential teachers or other adults, peer groups, one's social class, historical traditions, ethnic or religious groupings, gender identifications, and so forth. All of these are integrated during adolescence, and become crystallized into a stable character that serves as one's basic identity throughout adult life.

The fast change in appearance and size accompanied by the emergence of adult physical characteristics, especially in regard to sexual development, brings an upsurge of sexual drives that produces a new set of problems for the adolescent requiring weighing out the consequences of actions, and planning for one's future.

The questions become "Who am I?" "Where do I fit in?" "What will I become in the future?" One now has alternatives in working on the task of building an identity. It is fortunate that this development in cognition occurs along with the emotionalism of puberty, because it gives the teen a strong tool to combat impulsivity, intense feelings, and reactions to new social pressures in the peer group. The peer group is extremely important to the early adolescent. This is due to the developmental task known as separation-individuation, which requires the young teen to separate from his or her parents (psychically), and then to go about building an individual identity.

Adolescents, the 10 - 19 years age group, account for one-fifth of the world's population and nearly a quarter of India's population. They have very special and distinct needs, which can no longer be overlooked. By addressing their needs, one would not only be contributing to the socio-economic development of the country, but also in other societal concerns like social harmony, gender justice and population stabilization.

These are truly the years of creativity, idealism, optimism and a spirit of adventure. But these are also the years of experimentation and risk-taking, of giving in to negative peer pressure, of taking uninformed decisions on crucial issues, especially relating to their bodies and their sexuality. How adolescents cope with these challenges is determined largely by their environment. Adolescence is thus, a turning point in one's life, a period of increased potential but also one of greater vulnerability.

Schools are one of the settings, outside the home where children can acquire new knowledge and skills to grow into productive and capable citizens, who can involve, support and help their communities to grow and prosper. A Health Promoting School is a setting where education and health programmers create a "Joyful and Happy" environment that promotes diversity in learning and evolving.

In the last decade, mental health in schools has expanded to address school violence, sexual harassment, bullying, substance abuse, discrimination and healthy discipline. Modern school consultation focuses more on early identification and intervention at the individual and systems level to help attain immediate educational and behavioural goals and to prevent long term negative outcomes in the overall personality of children.

Majority of the public schools have no counsellors or a social worker, yet schools are being asked to deal with more and more mental health needs of their students. In addition, reports of increased bullying and school violence require a recognition and response to the psychic agony of the school campus.

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Child and Adolescent Mental Health Morbidity in India

According to ICMR study (2005), the overall prevalence of child and adolescent mental health disorders is 12-14 per cent. Table-1 shows that in the age group 0-5 years, maximum number of children (33 per cent) had diagnosis of hyperkinetic syndrome. The common diagnoses in age group 6-11 years were: hysterical neurosis, hyperkinetic syndrome, and conduct disorders. The common disorders in age group 12-16 years were: psychosis, hysterical neurosis, and conduct disorders. Psychosis and conduct disorder cases were significantly more among males while hysterical neurosis cases were more common among female children. Mild mental retardation was present in 22 per cent children in 0-5 years age group, 19 per cent children in 6-11 years age, and among 6 per cent in children of 12-16 years age group among those attending the psychiatric clinics/child guidance clinics.

To address the issues of growing up and the mental health needs of its students, health has to be integratel in the educational curriculum and schools have to adopt the framework of health promotion. A health promoting school is described as:

- One that is constantly strengthening its capacity as a healthy setting for living, learning and working.
- It focuses on creating health and presenting important causes of

Table 1: Pattern of Axis I diagnosis in three age groups

S. No.	Diagnosis	0-5 years (N-188)		6-11 years (N-632		12-16 years (N=1015)	
		No	per cent	No	per cent	No	per cent
1.	Psychoses	4	2.1	45	7.1	412	40.6
2.	Hysterical neurosis	3	1.6	142	22.5	274	27.0
3.	Conduct disorders	12	6.4	83	13.1	72	7.1
4.	Emotional disorders of childhood and other neurosis	8	4.3	39	6.2	50	4.9
5.	Hyperkinetic syndrome of childhood	62	33.C	92	14.6	9	0.9
6.	Enuresis	3	1.6	39	6.2	19	1.9
7.	Stammering and stuttering	5	2.7	33	5.2	25	2.5
8.	Specific disorders of sleep	2	1.1	8	1.3	14	1.4
9.	Psychalgia (Tension headache)	0	0	12	1.9	10	1.0
10.	Academic problem (Scholastic backwardness)	1	0.5	46	7.3	20	2.0
11.	Adjustment reaction	3	1.6	5	0.8	10	1.0
12.	Others	10	5.32	30	4.7	50	4.9
13.	No psychiatric diagnosis in Axis I	75	39.5	58	9.2	50	4.9

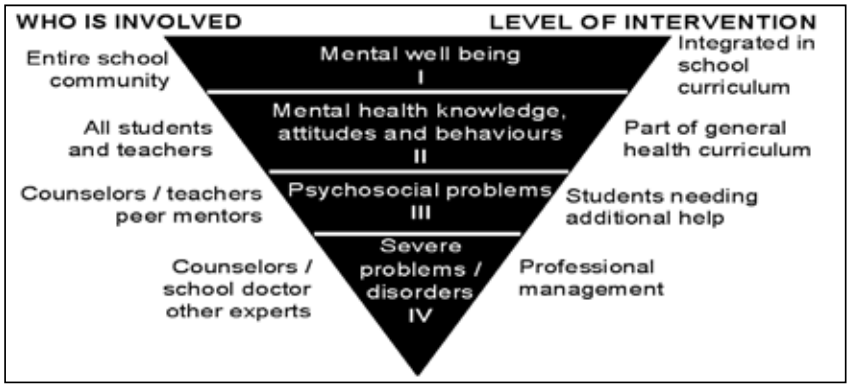
death, disease and disability by helping school children, staff, family and community to care for themselves.

- Take informed decisions over circumstances that affect their health and create conditions that are conducive to health. *(WHO - 2008)*

Components of the School Health Program

- A school environment that is safe.
- A sequential health education curriculum .
- A sequential physical education curriculum.
- A nutrition services programme.
- A social health services programme.
- Counselling, psychological and social services.
- Integrated family and community involvement activities.
- A staff health promotion policy.

A Framework for Mental Health Programmes in Schools



Types of Mental Health Interventions in Schools

1. **Mental Health Promotion-**to build awareness and resilience.
2. **Universal and Selective Prevention-**to reduce risk and vulnerability factors and build protective factors.
3. **Prevention and Early Intervention Strategies-**for those with early signs of disorder.

Levels I through IV can be likened to primary, secondary, and tertiary prevention efforts. Primary prevention and health promotion (**Levels I and II**) target the causes of healthy and unhealthy conditions with interventions which promote healthy behaviour and prevent a disorder from developing. Secondary prevention (**Level III**) targets a more selected population of high-risk people to protect against the onset of the disorder. Tertiary prevention (**Level IV**) targets people who already have developed the disorder with the intent of treating the disorder, reducing the impairment from the disorder, and / or preventing relapse.

Fundamental Guidelines for Implementation

School-based mental health programmes can be Environment-Centred or Child-Centred.

1. **Environment-Centred Approach:** In this approach, the aim is to improve the educational climate of the school and to provide opportunities for the child to utilize the healthy school programme. The positive mental health atmosphere includes the amount of time spent in school, the structuring of playground activities, the physical structure of the school and the classroom decoration. Such a programme provides a coordinated, collaborative effort to improve communication, understanding, and respect between staff, students and

parents. This provides a sense of direction and ownership of the programme.

2. **Child-Centred Approach:** Child-centred approach includes individual mental health consultations and specific problem-focused interventions as well as more general classroom programmes to improve coping skills, social support, and self-esteem.

To empower youth, every nation, society and community has to work towards promoting an atmosphere of well being. When adolescents acquire knowledge, attitudes, values and life skills, they benefit in a variety of ways. Life skills help adolescents to make informed decisions, solve problems, think critically and creatively, communicate effectively, build healthy relationships, empathize with others and cope with and manage their lives in a healthy and productive manner. Such knowledge and skills can lead to behaviours that prevent disease and injury, foster healthy relationships and enable young people to play leadership roles. The more progressive schools are taking an active part in the development of social and emotional competencies in a child. Schools can act as a safety net, protecting children from hazards that affect their learning, development and psycho- social well-being. School mental health programmes are effective in improving learning, mental well-being, and channelizing the management of mental disorders.

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India Launch of Inactivated Polio Vaccine (IPV)

The injectable Inactivated Polio Vaccine (IPV) in India was launched recently as part of India's commitment to the "Global Polio Endgame Strategy".

The Government of India is introducing IPV into its routine immunization program along with oral polio vaccine thus marking a landmark step to provide double protection to Indian children and securing India's gains of polio eradication. In the first phase, this vaccine will be introduced in six states, viz Assam, Gujarat, Punjab, Bihar, Madhya Pradesh, and Uttar Pradesh. IPV injection will be given to children below one year of age along with the third dose of the Oral Polio Vaccine (OPV) at the routine immunization sessions free of cost

Introduction of IPV in routine immunization is as per recommendations made in World Health Assembly in May, 2015 and endorsed by Global Polio Endgame Strategy.

Ancient Universities in India

Nalanda

Nalanda is an ancient center of higher learning in Bihar from 427 to 1197. Considered to be the World's first University, Nalanda was devoted to Buddhist studies, but it also trained students in fine arts, medicine, mathematics, astronomy, politics and the art of war.

The center had eight separate compounds, 10 temples, meditation halls, classrooms, lakes and parks. It had a nine-story library where monks meticulously copied books and documents so that individual scholars could have their own collections. It had dormitories for students, perhaps a first for an educational institution, housing 10,000 students in the university's heyday and providing accommodations for 2,000 professors. Nalanda University attracted pupils and scholars from Korea, Japan, China, Tibet, Indonesia, Persia and Turkey.

Although, the site was a pilgrimage destination from the 1st Century A.D., it has a link with the Buddha as he often came here and two of his chief disciples, Sariputra and Moggallana, came from this area. The large stupa is known as Sariputra's Stupa, marking the spot not only where his relics are entombed, but where he was supposedly born. The site has a number of small monasteries where the monks lived and studied and many of them were rebuilt over the centuries. We were told that one of the cells belonged to Naropa, who was instrumental in bringing Buddism to Tibet, along with such Nalanda luminaries as Shantirakshita and Padmasambhava. A small opening in the cell revealed a tiny room where Naropa supposedly meditated. Nalanda's main importance comes from its Buddhist roots as a center of learning.

Hsuan Tsang, the famous pilgrim from China came here and studied and taught for 5 years in the 7th Century A.D. Nalanda University at that time had over 10,000 students and 3,000 teachers. For some 700 years, between the 5th and 12th Centuries, Nalanda was the center of scholarship and Buddhist studies in the ancient world.

A great fire wiped out the library of over 9 million manuscripts and at the beginning of the 12th Century, the Muslim invader Bakhtiyar Khalji sacked the university. It was in the 1860's that the great archeologist Alexander Cunningham identified the site as the Nalanda University and in 1915-1916 the Archeological Survey of India began excavations of the site. What has been excavated to date is only a small part of the entire site but much of the ruins are beneath existing villages and are unlikely to be revealed.

Takshashila

According to available references Takshashila is dated back to at least the 5th century BC. Some scholars date Takshashila's existence back to the 6th century BC. Takshashila is described in some detail in later in Jātaka tales, around the 5th century AD. It became a noted centre of learning at least several centuries before Christ, and continued to attract students until the destruction of the city in the 5th century AD.

Takshashila is perhaps best known because of its association with Chanakya. The famous treatise Arthashastra (Sanskrit for The knowledge of Economics) by Chanakya, is said to have been composed in Takshashila itself. Chanakya (or Kautilya), the Maurya Emperor Chandragupta and the Ayurvedic healer Charaka studied at Taxila.

Generally, a student entered Takshashila at the age of sixteen. The Vedas and the Eighteen Arts, which included skills such as archery, hunting, and elephant lore, were taught, in addition to its law school, medical school, and school of military science. The ruins of Taxila contain buildings and buddhist stupas located over a large area.

The main ruins of Taxila are divided into three major cities, each belonging to a distinct time period. The oldest of these is the Hathial area, which yielded surface shards similar to burnished red wares (or 'soapy red wares') recovered from early phases at Charsadda, and may date between the 6th century BCE and the late 2nd millennium BCE. Bhir Mound dates from the 6th century BCE. The second city of Taxila is located at Sirkap and was built by Greco-Bactrian kings in the 2nd century BCE. The third and last city of Taxila is at Sirsukh and relates to the Kushan kings.

In addition to the ruins of the city, a number of buddhist monasteries and stupas also belong to the Taxila area. Some of the important ruins of this category include the ruins of the stupa at Dharmarajika, the monastery at Jaulian, the monastery at Mohra Muradu in addition to a number of stupas. Legend has it that Taksa, an ancient king who ruled a kingdom called Taksa Khanda the modern (Tashkent) founded the city of Taksaśilā. However Sanskrit Taksaśilā, appears to contain the suffix śilā, "stone" with the prefix Taksa, alluding to Taksa, the son of Bharata and Mandavi, as related in the Ramayana. In the Mahābhārata, the Kuru heir Pariksit was enthroned at Taksaśilā.

According to tradition the Mahabharata was first recited at Taksaśilā by Vaishampayana, a disciple of Vyasa at the behest of the seer Vyasa himself, at the sarpa satra yajna, "Snake Sacrifice ceremony" of Pariksit's son Janamejaya. According to one theory propounded by Damodar Dharmanand Kosambi, Taksaśilā is a related to Taksaka, "carpenter" and is an alternative name for the Nāgas of ancient India. The institution is very significant in Buddhist tradition since it is believed that the Mahāyāna sect of Buddhism took shape there.

Others Centers of Learning

Further centers of ancient learning in and around India include Odantapuri in Bihar (circa 550-1040), Somapura, in Bangladesh (from the Gupta period to the Muslim conquest), Jagaddala, in Bengal (from the Pala period to the Muslim conquest), Nagarjunakonda in Andhra Pradesh, Vikramaśīla in Bihar (circa 800-1040), Sharada Peeth, in modern day Kashmir, Valabhi, in Gujarat (from the Maitrak period to the Arab raids), Varanasi in Uttar Pradesh (8th century to modern times), Kanchipuram, in Tamil Nadu, Manyakheta, in Karnataka, Puspagiri, and Ratnagiri, in Orissa. In Sri Lanka, Sunethradevi Pirivena, a centre of Buddhist learning, founded circa 1415 AD.

The Temple Colleges of South

Dilip K Chakrabarti

The evidence of the temple colleges and agraharas is remarkable, proving the existence of a well-laid-out network of educational institutions at the village level in south India and possibly in the north as well. In the north, the Saivite Mathas of this period fulfilled educational roles. One can easily see a Matha of this type in the complex of temples at Menal between Kota and Chitor in Rajasthan

Major light on the educational system of ancient Indian system is thrown by a number of inscriptions, the most important of which seems to be the Salotgi pillar inscriptions A, B and C, the earliest of which dates from Saka-Samvat 867 or 945 AD. The inscription has been edited by F Kielhorn and H Krishna Sastri in the fourth volume (1896-97) of *Epigraphia Indica*. Among other things, the inscription states that the chief of the village of Pavittage, Chakrayudha Budha, bathed in the Godavari on the occasion of a solar eclipse, and gave to the community of scholars of the school located in the village some 500 *Nivartanas* of tax-free land. One *Nivartana* of land is supposed to be equal to 5 acres. So this village chief donated about 2500 acres of land to the school .In addition, he donated four *Nivartanas* of land for the school flower-garden and twelve *Nivartanas* of land for the expense of putting lights in the school. In addition, 27 dwelling places were donated to the school.

Further, the school's funds were supposed to increase with the help of specified donations to it on the occasions of village marriages , tonsure ceremonies and thread-investitures.

"When a feast for some reason has to be given here to the Brahmanas, the assembly shall feast according to its mean members of (this) assembly. And for the teacher in this school, the magnanimous one has destined fifty *nivartanas* of land exempt from taxes, and for the same also one dwelling place, exempt from taxes."

The foregoing is the content of the Salotgi temple inscription designated A. The inscription B is not dated but has been taken to be contemporary with the inscription A (i.e 945 AD). The inscription appears to record that the school , the building of which was referred to in the inscription A, was re-built by a certain Kanchiga who was a native of Kupanapura and a member of the race of the Seleras; that he bestowed certain land on the same hall; and that he caused this edict to be inscribed.

The inscription C is not dated but supposed to belong to the 11th/12th century AD. The man who got it inscribed was Mahamandalesvara Govunarasa who was the lord of the city of Kopanapura and was born in the race of the Silahara king Jimutavahana. Again, some land was donated to the school for its over-all maintenance. The third inscription is dated in the 11th century AD.

As these inscriptions spread over more than a hundred years (945 AD

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– 11th century AD) testify, the school located at the village Pavittage in the Mahisha district of Karnataka had enough donations of land from the people in and around the village to take care of all its needs – buildings, cost of living of both teachers and students, general maintenance, lighting and flower-gardens. There was additional support from the villagers too: the equivalent of 5 rupees at every marriage, the equivalent of two-and-a-half rupees for every *Upanayana* and the equivalent of a rupee and a quarter for every tonsure or *Mundana* ceremony.

The Salotgi inscriptions offer a clear example of what may be considered a temple college. There is inscriptional evidence of a few more temple colleges of this type in South India.

There was an early 11th century AD college of this type at Ennayiram in South Arcot district of Tamil Nadu, with 16 teachers teaching a fixed curriculum. The college was endowed with 300 acres of land by the local village community to support free education and maintenance of 340 students. There were fixed numbers of seats for each subject that was taught-75 seats for the Rigveda and Black Yajurveda each; 40 seats for the Samaveda; 20 seats for the Atharvaveda, Baudhayana Dharmasutra and Vedanta each; 25 for grammar; 35 for Mimansa and 40 for what has been called *Rupavatara* (unknown). It was thus, predominantly a Vedic college. There were three teachers each for the Rigveda and Black Yajurveda. For Mimansa, there were two teachers and the rest of the subjects had one each. Each Vedic student was entitled to one seer of rice per day, receiving in addition one eighth tola of gold per year for other expenses.

The students of grammar and philosophy received about 66 per cent extra allowance. Teachers received 16 seers of rice every day, although the teacher of Vedanta received a 25 per cent higher amount.

The Tirumukkudal temple college of the 11th century was located in the Venkatesh Perumal temple at Tirumukkudal in Chingleput district and maintained a college, a hostel and a hospital. Sixty students were maintained here, with subject-wise quotas of students; 10 for the Rigveda, 10 for the Yajurveda, 20 for grammar, 10 for the *Pancha-ratra* system, 3 for *Saivagama* and 7 for *Vanaprasthas* and *Sannyasins*. Vedic teachers received three seers of rice per day. This suggests that they were part-time teachers. The grammar teacher was possibly a full-time employee because he used to get 8 seers of rice per day.

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At Tiruvorriyur in Chingleput district, there was a big grammar college in the 13th century, which was located in a big hall adjoining the local Siva temple. The college had an endowment of 400 acres and it existed even in the 14th century when certain additional taxes were assigned for its upkeep.

At Malkapuram in the Guntur area of Andhra, an inscription of 1268 AD shows the location of a complex comprising a temple, a college, a hostel and a hospital. The college had eight teachers : three for the Vedas and five for grammar, literature, logic and Agamas. There was a doctor in charge of the hospital. Each teacher of the Malkapur temple college received two *Puttis* of land as their wages, and that was double the amount of land received by the carpenters and drummers of the temple establishment.

A.S. Altekar (*Education in Ancient India* 1944, pp 136 ff) points out that there were many more similar temple colleges in the Deccan in 900-1400 AD. For instance, at Hebbal in Dharwar, Matha in the Bhujabbesvara temple in the 10th century AD enjoyed an endowment of 200 acres of land for the upkeep and education of students. At Nagai in Andhra, 200 students were instructed in Vedic lore, 200 in Smritis, 100 in epics and 52 in philosophy in the Sanskrit college of its temple. Its library employed 6 librarians. A temple in Bijapur in 1075 AD received an endowment of 1200 acres of land for providing food and cloth to ascetics and for maintaining the students of a Mimansa school set up by Yogesvara Pandita. Records are also available for the following temple colleges in the south: Managoli (Bijapur) a grammar school with an endowment of 20 acres in the second half of the 12th century; in the Dakshinesvara temple of about the same time at Belgame in Karnataka a temple school; at Talgonda in Shimoga, a college of 1158 AD in the local Pranesvara temple offering maintenance and education to 48 students in the Rig, Yaju and Sama Vedas, *Prabhakara-Mimansa*, philosophy (Vedanta), linguistics or *Bhasha-Sastra* and Canarese. Two cooks were employed in the kitchen of the college. At Punnavayil in Tanjore, a grammar college attached to a temple had an endowment of 400 acres.

Altekar (ibid., 137-138) adds:

"South Indian Inscriptions Nos 604, 667, 571, and 695 …record various grants for the salaries of teachers and boarding of students studying in different temple colleges in Tamil country. The last of these records is an interesting one, for it records a donation for a Sarasvati-Bhavana or library of a temple college in Tinnevelly district. These instances of temple authorities organizing Sanskrit schools and colleges are typical of the age. Many more must have existed, whose memory has not been handed down to the present

times. For down to the 18th century, almost every religious centre in south India used to maintain a Sanskrit school or college. The whole country was in fact, studded with them."

Altekar argues that the same system must have prevailed in the major temples and villages of northern India, many of which were subsequently pulled down.

Another category of the ancient centres of learning, especially in the south, was constituted by the Agrahara villages. At Kadiyur Agrahara (modern Kalas in Dharwar district), which was made an Agrahara village by the Rashtrakuta administration in the 10th century, 200 Brahmanas were engaged in teaching the Vedas, grammar, Puranas, logic, works on polity, the science of literary composition, and the art of writing commentaries. There was an endowment for the salaries of teachers and a feeding house was maintained in the village possibly for the upkeep of the poor students.

The evidence of the temple colleges and agraharas is remarkable, proving the existence of a well-laid-out network of educational institutions at the village level in south India and possibly in the north as well. In the north, the Saivite *Mathas* of this period fulfilled educational roles. One can easily see a *Matha* of this type in the complex of temples at Menal between Kota and Chitor in Rajasthan. ❑

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FROM OUR READERS ...

The contents of Yojana magazine are really appreciable & highly commendable. This magazine provide holistic & detailed analysis of prevailing social, political & economic scenarios. If possible please provide a mobile app for your magazine. My best wishes to Yojana team *Ejaz jafar*

I am very thankful to yojana team who put so much efforts in presenting issue and policy from scratch. It helps people like me who is preparing for civil services and in general to all who want to know governments response and welfare scheme. I would like to suggest to include economics and science section in few pages also. *Kamal Kant Singh, Ghaziabad*

I Am A Regular Reader of Yojana Magazine Since Last Few Years. I Feel No Exaggeration In Claiming That It Has One of The Most Authentic and Realiable Data with Complete Subject Coverage. Lately With Various Developments In International Scenario, Economics And Finance Has Become An Important Issue For India As Well As For World. I Hope To See These Latest Developments In Forthcoming Yojana's Issue. My Best Wishes To Yojana Team. *Arvind Singh Chauhan, Chamba H.P*

I am an engineering student and i aspire for civil services... This journal is an ultimate one and gives the vast knowledge on any topic... The illustrations with the help of graphs provide easy approach to learn things. As far as december issue is concerned, it was really awesome to read about climate change as cop 21 just held in paris. The articles provided linkage of climate change with different aspects. They were very descriptive. I congratulate the whole team for the efforts they put for our "yojana". This journal is a must for all which provides a vault of knowledge in such a low price. I am assured that yojana will be a torchbearer in my preparation of civil services. Sakul Garg, Haridwar (Uttarakhand)

The magazine is excellent. Here are few suggestions:

Include at least two full page topics in 'do you know' section. - introduce a diagrammatic flowchart based explanation of recent national/international phenomena. - every edition should have an article about some international best practices regarding health/education/environment. - one interview of a constitutional office holder like CAG, CVC, EC, CJI, NHRC, RBI, etc. - one page for excerpts from ancient literature and knowledge of india.- one review of a book by an Indian author about national issues. Deepak Shahi, MBBS (KGMC, lko)

The content of Yojana is outstanding. It sheds light on every critical issue in our economy. Readers, especially students, get valuable information at inexpensive rate, makes Yojana a household name. The articles are written in simple way is also appreciable. The special page "Do you Know" gives vital information about different terms is simply Tremendous. Rizwan ul zaman, Dogripora Awantipora, J&K

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I am very greatful to the intellectual society of Yojana journal for feeding us with their comprehensive, focused and a qualitative knowledge on various issues that too at a very affordable price. I request you to include some burning topics on environmental issues and science and technology. Pleased to be a regular reader of Yojana. Thanks *Muzaffar Elahi, Kashmir*

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Thanks once again!

Your feedback is valuable to us in planning our issues.

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