INDIA'S HIGHER EDUCATION

Proceedings of a Seminar

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Contents

PREFACE

On behalf of Innovative Thought Forum, we accord a very warm welcome to you all. Today is the auspicious day of Ramnavmi and I offer my greetings for the same. The day has not been selected by design but it has happened as a default. Innovative Thought Forum is a neutral, agnostic and a political platform for deliberating upon India Centric Problems and come out with solutions that may be lead to pilotable projects. These projects can be implemented with or without government support in difference parts of the country. We had five rounds of brainstorming so far on subjects namely, Land and Water, Agriculture and Allied Sectors, Food Processing and Food Nutrition Security, India's Energy Security and Healthy India.

Today's brainstorming is on Education, a subject vital to all of us and to the country. It is a vast field that starts from home, moves to School, College, and University and so on. Every one of us has an opinion about education. India has made significant progress in increasing the primary education attendance rate to approximately seventy five percent of population in the 7-10 age groups. At the tertiary level also, India is making significant gains, which is often cited as one of the main contributors to its economic development. Inspite of very high private participation, however, much of the progress in higher education and research has been in the public institutions. There is a gross need to catch up with tertiary enrolment levels (presently 24%) comparable to that of developed nations. This is necessary to reap demographic dividend from India's relatively young population.

Education in totality is a very vast field. We therefore decided to concentrate in this session on Indian higher education, which is central to national economic development. Creation of knowledge, its compilation, acquisition followed by transmission and absorption are various elements of an education system. Final results are measured through evaluation and certification. India has been a country of knowledge creation since ancient times, when we were far ahead of most countries. Due to various invasions of the country that knowledge was destroyed. The British India established the present systems of schools, colleges and universities with syllabi matching those of western countries. The knowledge therefore acquired by the students does not match, very often, the requirements of the Indian society particularly in the rural areas. Along with the learning therefore skill acquisition suited to various tasks is very essential to obtain optimal results from the learning acquired from the institutions. Normally in the western countries learning and skilling go together in respective institutions. In India, education is dealt by the Ministry of Human Resource and Development, whereas skilling in various fields is looked after in other ministries.

We have with us today very eminent and experienced experts and we look forward to very interesting and absorbing presentations and discussions. We hope that small contributions from our forum make visible impacts on the education policy of the country.

N.K Bansal

Trustee

S.B Dangayach

Founder Trustee

Setting The Stage

Bajrang Lal Gupt

Please accept my best greetings on the auspicious day of Ram Navami. Shri. Dangayachji said that today's deliberations on higher education have not been by design but by default. I somehow don't agree by any of them. I would say that this planning has been done by God or it is God's wish that this forum debates today on the important topic of 'Shiksha' (education), because today's education lacks Sanskar (Moral norms and values). There is no element at all, at any level, primary, secondary or tertiary an element of moral norms, values and character. So today's seminar is the wish of Ram. This I will correlate now to the writing of Maha-kavya (court epic); Naradji asked Valmiki to write an epic poetry on Rama. Valmiki asked Naradji, who Ram is? Naradji then introduced Ram in one word only, namely, Sakashat Dharmo Vihrayan, meaning that Ram is the world's saviour of Dharma (Religion).

God Ram is also known as Maryada Purushottam Ram. Maryada means Dignity with conduct. Our education system today fails to teach character building and the limitations of one's behaviour. The education, the education system and its delivery have been a subject of discussions even before freedom. During the freedom struggle, our leaders had promised to remodel our education policy based on Indian ethos, Vedas and Indian thought. After freedom many commissions and committees were constituted to draft India Education Policy and contents containing Indian element. All draft report has touch of the Indian system; however, the bureaucrats and politicians cut out this element and the system worsened each consecutive year. The reason has been the complete ignorance about the opinion and need of the vital stakeholders. The framework of education needs to be drafted after due deliberations amongst not only the experts but general public, who ultimately are the main stakeholders of education.

Today's topic of the seminar is on 'higher education'. In my opinion, it is not good to compartmentalize education, because it is a continuous process. However, the organizers must have thought for a discussion above a certain level of education. I have therefore chosen to speak today on the vision (Drishti) and direction (Disha) of education in six components. I will not go in to the details, because there is no time for that and also I feel that details may be beyond by capacity. But I will touch upon all these components judiciously.

The first topic that I will like to touch upon is the meaning and objectives of Education. Our Maharishis have narrated many things about Shiksha (Education). (Sa vidya se vimuktaya). Shiksha is the weapon to free man from his sorrow and physical means. Indian education systems has stressed upon Sanskar (Traditional Moral Values). Only collection and dissemination of information can't be termed as education. If this were true then the libraries would have been great saints and encyclopaedia the great Rishis. Only providing information therefore is not education. According to Swami Vivekanandji, education is the manifestation of perfection already in the man. Education is not only book learning, it is diverse knowledge. Not only that even the training by which the current and expression of will are brought under control and become fruitful is called education. Complete continence gives great intellectual and spiritual power. Sri Aurobindo has also explained education namely, Shiksha Ke Madhayam Se Vyakti Ka nirman Hota Hai (By means of education only the man develops character knowledge, capabilities, moral rules, make himself self reliant and socially useful), getting education only for employment is a very short sightedness. Education should have social relevance with capabilities and skills that are used to provide solutions to various problems.

With this I touch upon the second topic, namely, the need of interdisciplinary or trans-

disciplinary studies. The modern system has compartmentalized education by dividing into various isolated divisions like Natural Sciences, Social Sciences, Life Sciences, and Humanities etc. In the study of economics there is no place for ethics. It has become a game of numbers like GDP. The very definition of GDP is illusionary.

It is very important to interconnect our subject with another, and then only one becomes capable of finding implementable solutions to complex problems. There is a need to develop synergies between various disciplines. Our Shastras have been discussing the subjects in totality and interdependent on each other. Indian thought is multidimensional, which has been lost in the present education systems. There are two main reasons for that, namely (1) modern books are based upon western point of view, which is fragmented and (2) this view is highly insensitive (ASAMVEDANSHEEL) and magnetic view. The western view is to exploit unlimited possession from limited resources leading to natural disasters and environmental problems.

We often hear of two ages in Europe, Viz. (1) Dark age and (2) Jagran age. The events and discoveries of Jagran age are the causes of main problems in today's world, which has become highly materialistic and physical. Indian philosophy has put science and spirituality together. Swami Vivekanand said that "we must have the whole education of our country, spiritual and secular, in our own hands, and it must be on national lines, through national methods as far as practical. Of course this is a very big scheme, a very big plan, we must begin the work ". Science and technology are important, but we can't find solution to all problems of world by science and technology alone. Hence Indian philosophy and the Indian way need to be brought together.

Next point that I would like to touch upon is the direction of education. India is a country of unity in diversity. Direction of education should be cooperation and not separation. There is no place for bitterness in heterogeneity. Dr. Vasudeo Sharan Agarwal said that there are many mankind in the world. They have different cultures. This is not a burden but a decoration. Though, within the boundaries of a country and the limit of time, our close relationship is possible only with one culture. The same is immersed in our heart and soul. This does not mean that we remain conservative in our thoughts. The truth is that more we know about ourselves and our culture, we become curious to know other humanities, culture, thoughts and religions. Progress of one's interior leads to development of the exterior. Nowadays there is a tendency to raise questions on every issue. Asking questions is fine but not sufficient. Questions should be accompanied by answers and solutions to the problem.

My next topic of discussion is the Nature and Environment. The western philosophy has been to exploit nature for maximum comfort. However, the development of man, nature and environment has to be in harmony with each other, known as Dharma. Both Deen Dayal's and Gandhiji's understanding of a society's welfare are enhanced by this dimension. Max understands the individual needs and social arrangements (the classless and non-exploitable society). Though commendable, excludes both the divine and natural world and focuses exclusively on man & society. His humanism is derived from Greek Sophist Philosopher Protagoras, who said that the man is the measure of all things. Hence there is very little of environmentally conscious programs in classical Marxian thought and certainly there is notably the absence of divine, either in the universe at large or in the historical process. Deen Dayal's integral humanism opens up the individual not only to his fellow human beings but also to nature and the Divine. Gandhiji saw his village republic as being as close to Nature, while Deen Dayal working in the context of post independence India, with an already flourishing economy based as on a capitalist mode of production, attempted to humanise the system

by putting forward an integral economy that would see human society as an organic system for economic planning and programs.

While discussing organic economy, one comes to the discussion of micro and macro relationship. In the western philosophy man and society are understood as separate entities. In the Indian thought however, man and society are made for each other interconnected closely like a tree and its roots. Swami Vivenkanand has expressed his opinion about the inseparability of Man & Society. Modern Indian thought is plagued by Euro-American and Marx opinion. The present day Indian intellectual does not even understand and neither he want to understand the Indian thought. The academic world of India is deeply influenced by the thoughts of Marx, Macanlay, Mission, Madaisa and Mudra. India needs to be free from this mind set. The whole concentration on materialistic world is the manifestation of Euro-American thought. In order to free our younger generation from the prevalent mind sets, we need to do three things:

Develop conceptual frame work based on the views of our Maharishis.

Define behavioural assumptions.

Develop new structure for institutional set up.

Shri. Dharam Pal, a noted author and freedom fighter, said that in order to develop new paradigms of development one needs to understand the Indian thoughts and Indian humanism through a study of ancient Indian literature. We need to understand Indian mind set over a certain time period, understand Indian people and most importantly interpret the world's civilization from Indian point of view. Our measure of economic development should not be only GDP but we must develop our own measurement index of development. Our education system needs to be restructured by including Indian philosophy and Indian intellect and thought.

Chapter 1

Indian Higher Education System: Problems & Solutions

N.K Bansal

1.   Introduction.

Indian has been a very old culture with rich heritage and traditions for higher learning. There are enough evidences that many foreign scholars used to come to India for higher learning during 500 BC. Significant contributions have been made by the Indian scholars in ancient India, in mathematics, astronomy, agriculture, medicine, metallurgy, civil engineering and architecture.   In the Indian subcontinent, major Buddhists monasteries, notably at Pushpagiri, Nalanda and Taxila were institution of higher learning in ancient India.   Pushpagiri was established in the 3rd century AD at a place which is presently in Odisha.   Nalanda was established in the fifth centaury A.D in Bihar and survived until 1200 AD.   Nalanda had nine storey library. Taxila in ancient India (place now in Pakistan) was an early Buddhist centre of learning. Other Indian ancient Universities between 550-1120 are shown in Fig.1

Other Indian Ancient Universities: 550-1120

- ➤ Odantapuri in Bihar(550-1040)
- ➤ Somapuri in Bangladesh 810-850)
- ➤ Jagaddala in Bengal(1077-1120)
- ➤ Nagarjunakanda in Andhra Pradesh (225 AD - 325 AD)
- ➤ Vikramshila in Bihar(800-1040)
- ➤ Sharda Peeth in Kashmir (1277–78)
- ➤ Varanasi in Uttar Pradesh (800-
- ➤ Manyakheta in Karnataka(814 A.D. to 968 A.D)
- ➤ Pushpagiri in Orrisa (700 AD to 1300 AD)
- ➤ Ratnagiri in Orrissa (900 AD)

Fig. 1: Location of other ancient Indian universities

Most of the ancient Indian Universities were destroyed particularly by Islamic invaders starting from Turkey's Bakhtiyar Khilji. Later Islamic rulers established several educational institutions, which included traditional Madarsas and Mahtabs teaching grammar, philosophy, mathematics and law influenced by Greek traditions and inherited by Persia and Middle East before Islam spread into India.   Under the rule of Akbar, the education system adopted an inclusive approach favouring additional courses like medicine, agriculture, geography and texts from some other languages and religions such as Patanjali's work in Sanskrit.

The British made education in English a high priority hoping it would speed modernisation and reduced administrative charges. The colonial authorities had a sharp debate over the education policy. The Orientalists school believed that education should be provided in Indian languages (favoured languages were Sanskrit or Persian). The utilitarian (also known as anglicists) like Thomas Babington Macalnay, strongly believed that traditional India had nothing to teach regarding modern skills and therefore the best education for them should be provided in English. Macalnay called for an

education system that would create a class of Indian who would serve as cultural intermediaries between the British and the Indians. He succeeded in implementing ideas previously put forward by Lord William Bentinck, the Governor General since 1829. Bentinck favoured the replacement of Persian by English as the official language, the use of English as the medium of instruction and the training of English speaking Indians as teachers.

2. Modern Education System.

The native elite demanded modern education. Three universities and an institution of higher learning were established in the year 1857 in the eastern, western and southern regions. The first were University of Calcutta, followed by University of Madras, University of Bombay and the Presidency college of Madras, soon many more institutions of higher learning were established as given in Table 1.

Table 1 : Indian Higher Education Institutions established by the British.

Table 1 : Indian Higher Education Institutions established by the British.	
University / Institution	Year of establishment
University of Calcutta	1857
University of Madras	1857
University of Bombay	1857
Presidency college, Madras	1857
College of Engineering, Guindy	1858
St. Stephen's College, Delhi	1881
University of Punjab	1882
Allahabad University	1887
Patna University	1917
University of Dhaka(now in Bangla Desh)	1920
Nagpur University (now in Pakistan)	1923

In the year 1947, there were total 21 Universities in India (19 in present India, 1 in Pakistan, 1 in Bangla Desh)

3. The Great Private Initiative.

During the period between fifteenth century and eighteenth century scientific revolution took place in Europe towards the end of Renaissance period. Modern science grew during this period because of path breaking discoveries in mathematics, physics, astronomy, biology and chemistry. The discoveries transformed the views of the society about nature. Indians, who were influenced by the scientific discoveries of Europe, made remarkable efforts to establish scientific institutions in India. There are mainly four institutions of repute that were established by individuals or a group of them.

These are:

Indian Association for cultivation of science (IACS), Calcutta 1876.

Indian Institute of Science (IIS) Bangalore 1909.

Banaras Hindu University (BHU) 1916.

Tata Institute of Fundamental Research (TIFR) 1945.

Indian Association for the cultivation of Science (IACS) is an institute of higher learning in Kolkatta and it was established in the year 1876 by Dr. Mahendra Lal Sarkar, a private medical practitioner. This institution is engaged in fundamental search in fields of Physics, Chemistry and Chemical biology. Noble laureate Sir, C.V Raman did his ground breaking research on Raman Effect in this institution. IISC was established in the year 1909 with active support of Jamsetji Tata and H.H Sir Krishna Raja Wadiyar IV, the Maharaja of Mysore. The BHU was established by Pandit Madan Mohan Malviya, a prominent lawyer and an Indian independence activist. It was the first residential university. With the support from J.R.D Tata the chairman of the Tata Group, TIFR was founded in the year 1945 and Homi Bhabha, known for his role in the development of Indian Atomic Energy Programme, was appointed its first Director. All these four institutions, developed during in the pre-independence period with private initiatives. After independence Gov. of India is providing finances to these institutions and they continue be amongst best science centres in the country. The private sector institutions in the country already contribute about 60% of total institutions in professional education. However, the increasing number of professional private institutions has brought about its own set of issues and challenges. A number of institutions have come up without proper checks and balances. They lack proper academic and physical infrastructure and the quality of graduating students is very poor.

4.   Higher Education in Post Independence India.

In the post independence period, there was remarkable improvement in scientific and technical education and research. The new constitution did not change the overall administrative policy of the country. Education continued to be the prime responsibility of state governments. The central government continued to assume responsibility for the coordination of educational institutions and the maintenances of appropriate standards in higher education and research. In the year 1947, the Government of India appointed three important commissions for suggesting educational reforms. The University Education Commission of 1949 made valuable recommendations regarding the reorganization of courses, techniques of evaluation, media of instruction, student services and recruitment of teachers. The Education Commission of 1964-66, made a comprehensive review of the entire field of education and their report led to a resolution on a national policy for education, issued by Govt. of India in 1968.

A Department of Higher Education was created under the Ministry of Human Resource and Development, which was headed by a cabinet minister. Autonomous organizations like All India Council of Technical Education (AICTE 1945), University Grant Commission (UGC 1953) and National council for Education Research and Training (NCERT 1961) were all attached to the Department of Education.

Depending upon the educational field and requirements for higher research, especially in science & technology, medical and agriculture subjects a number of organizations and departments were created. The chronological list is given in Table 2.

Table: Organization for Higher Research & Education in receptive fields established after independence. (A couple of these were already established during the colonial rules).

Organization	Year of establishment
Indian Council for Medical Research (IRFA in 1911)	1949
Atomic Energy Establishment Trombay (AEET)	1954
Indian Space Research Organization (ISRO)	1969
Indian Council for Agriculture Research (ICAR)	1929
Medical Council for India (MCI)	1934
Department of Science & Technology (DST)	1971
Department of Biotechnology (DBT)	1986
Ministry for New and Renewable Energy (MNRE)	1992
Ministry of Earth Sciences (MOES)	2000
Department of Health, Education and Research.	2014

But for AEET & ISRO, all other organizations are administrative or regulatory bodies; the hierarchal chart is given in Fig. 2. There are many professional institutions that are not empowered to award degrees and therefore run diploma level programmes. These institutions are Polytechnics, PGDM recognized by AICTE, Teachers Training Institutions of NCERT, Nursing Institutions recognized by Indian Nursing school and institutions directly under the control of various ministries

Higher Education
## Regulatory Bodies
(Governing ministries)
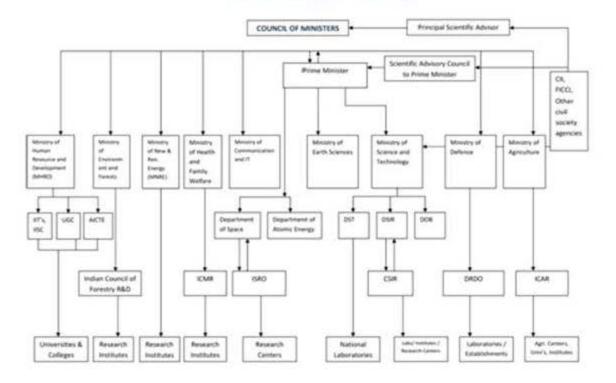
Fig.2: Indian ministries and regulatory bodies for higher education in India

5.   Universities and Institutions of Higher Learning.

The number of universities and institutions of higher learning has grown enormously. There are 716 universities, 75 institutions of national importance and 39071 colleges with a total enrolment of 34.6 million students; it means a general enrolment ratio of about 24%. The type of universities and their number are given in Table 3, 4 & 5

Table3: Number of universities and other institutions in higher education in India

Central Universities	45
State Universities	329
Deemed Universities	132
Agriculture Universities	71
ICAR Institutes	100
Private Universities	205
Medical Institutions	381
Institutes of National Importance	75
Affiliated Colleges	39071
Enrolled Students	34.6 million

Table 4; Number of higher education institutions in subject categories

General	459
Technical	101
Agriculture and Allied	64
Medical	50
Law	20
Sanskrit	11
Language	7

Table 5: Standalone non-degree institutions

|	
Diploma Level Technical	3845
PGDM	431
Diploma level Nursing	3114
Diploma Level Teachers' Training	4730
Institutions Under Ministries	156

The institutions of higher learning are tabulated given below.

- Indian Institutes of Technology (IITs)
- National Institutes of Science Education and Research
- Indian Institutes of Information Technology (IIITs)
- Indian Institutes of Science Education and Research (IISERs)
- Indian Institute for Science (IISc)
- National Institutes of Technology (NITs)
- Schools of Planning and Architecture (SPAs)
- Indian Statistical Institute (ISI)
- Indian Institutes of Engineering Science and Technology (IIEST)
- All India Institute of Medical Sciences (AIIMS)
- National Institutes of Pharmaceutical Education and Research (NIPERs)
- National Institute of Design
- Directorate of Medical Institution and Research

With respect to quality and quantity, there are enormous disparities between these institutions. Indian education today fall many challenges, some of which are being discussed below:

In a survey by nature, an article highlights the contribution of Indian scientific researchers versus the contributions from US, China, Italy and other main brick countries. The results of survey are illustrated in Fig. 3 &4. In order to identify the leading science intuitions, Nature looked at the citation rates in Elsevier's Scopus database for institutes that had produced more than 2000 papers during 2010-2014.
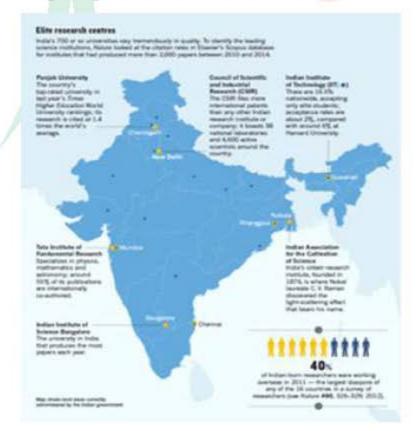
Fig. 3: Higher education elite research centres
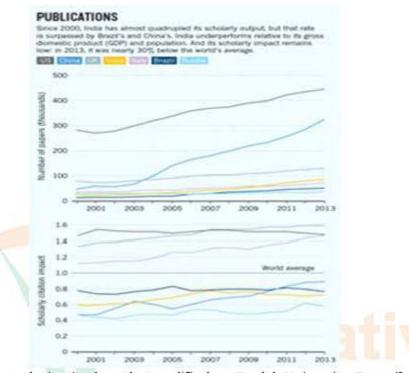
Fig. 4: Research publications in India, US and other major countries

In this category, the institutions that qualified are Punjab University, Council of scientific and Industrial Research, Indian Institutes of Technology, Tata Institute of Fundamental Research, Indian Association for cultivation of science and the Indian Institute of Science, Bangalore. It was also observed that 40% of Indian born researchers are working overseas – the largest diaspora of any of the 16 countries in the survey (Nature 490, 326-329, 2012) Fig. 4 shows that since the year 2000, India has almost quadrupled its scholarly output, but that rate is surpassed by Brazil's and China'

India underperforms relative to its gross domestic product (GDP) and population. India's scholarly impact remains low; it was 30% below the world average in 2013.

6.   Challenges faced by Indian Higher Education

Higher education system in India is the third largest in the world next to US and China. The UGC advises the government on policy and acts as a coordinator between the centre and the state. The emphasis at the tertiary level of education lies in science and technology.

The demographic trends suggest that India will soon overtake China as the world's largest population and with an expected GDP growth rate of 8% the middle class that demands education will swell to 500 million by 2025. The higher education system needs to be ready to effectively serve the aspirations of this growing middle class. The system is in dire needs to innovate and bring adequate changes. Four broad based challenges faced by the system are:

The supply – demand Gap.

Present enrolment in higher education is 24% compared to 26% in China and 30% in Brazil. Enormous unmet demand requires almost 30 million more university places.

Low quality of teaching and learning.

The system is beset by the issue of quality of teaching and learning in many institutions. There is

chronic shortage of faculty, poor teaching quality, outdated and rigid curriculum, lack of accountability and quality assurance and little integration of research and teaching.

Constraints on research capacity and innovation.

With a very low level of Ph.D. enrolment, India has very few quality researchers. There are very few opportunities for interdisciplinary or multi-disciplinary working and lack of early stage research experience. The system is extremely weak of innovations and industry engagement, which is very low.

Uneven growth and access to opportunity.

Socially, India remains highly divided; access to higher education is uneven with multi dimensional inequalities in enrolment across population groups and geographies.

7.   The New Initiatives

The present government has laid emphasis to find solution to the challenges and the government's plans based on three central pillars reflecting these realities.

Expansion.

Equity.

Excellence.

Every aspect of higher education is being reorganized and remodelled, namely funding, leadership and quality assurance, accountability, relationship with the industry, international collaboration and the way teaching and research are conducted. While new institutions are planned, but the emphasis will be on strengthening the existing intuitions.

The private sector, which currently accounts for 59% of tertiary enrolment, continues to grow rapidly providing mainly professional courses mostly in engineering and management. The private sector is expected to play significant role in future expansion of higher education; however, they need to take balance approach to include basic sciences and interdisciplinary research is their mandate.

Views of Stakeholders

The Government's reforms have broad based support, but many feel that it is and un-predictable process and the outcome may be messy. Already, the devolution of authority and responsibility for higher education to the states has begun. However, there will be huge differences in the capability and the will of different states to act. There could therefore be great variation in reforms across the country.

Key challenges faced by the system include quality assurance, credit transfer system, movement between higher education and vocational skills streams and teacher's training in higher education. There is an urgent need for systematic changes in affiliated colleges to improve quality of teaching & learning.

Institutional Engagement

Increasing internationalization in research and teaching is strongly supported by the country and considered vital for developing the capacity in research and innovation driving up India's

institutional rankings and increasing the quality of teaching and learning. There are some steps that the universities and institutions should take to make them competitive.

> International credit recognition

> Encouragement for foreign faculty and students

> Raising the quality of teaching & learning

> Blended teaching interpreting normal teaching methods and digital learning technology

> Distance learning approach to serve a large population.

The Media's opinion

The economic times in its editorial on 15th March 2017 published the following:

Alone IISC among School of Excellence, a 100 year old institution has been ranked for several years among top 250 institutions. It has now been ranked within 10 best institutions among small universities. For IISC, it is a moment for celebration, but not for Indian Higher Education Sector. Policy makers and regulators need to learn from the IISC and develop a blue print that can be replicated, scaled up and innovate across the country. Core purpose of higher education institutions and universities is to create knowledge and value. This can be cutting edge research in science, technology, engineering and medicine or research in social sciences, design or instruments that tackle social and economical questions. A university must be judged by the quality of human resource it produces and the research and its dissemination, interaction with either policy maker, impact it has on systems and policy. Indian institutions have concentrated on teaching particularly at the UG level. Academia has not deemed for the industry. In fact this is a legacy of the colonial policy that used higher education not to create knowledge but to produce capable boys for their administrative setup in the country.

The increasingly globalised and now automated world requires reorientation of the education system. Indian Higher Education System needs to change from degree dolling units to knowledge creators. This will require policy support. Policy must vigorously pursue excellence in higher education.

Of course there is a need for policy support, but the main issue is to create enabling environment so that teaching profession retains its glory and a person feels proud of a systems that provides necessary inputs to all the activities. Also, in order to provide professionals a rapid role in a growing economy, the country has missed on the basic research. In this context, the editorial of Economic Times on 21st March 2017 published the following:

It is time to make pure sciences attractive again. India's dreams of building a knowledge economy and staying competitive among the major nations of the world will depend on overhauling its education systems to give basic sciences and research in to their advice the primary status they serve. Apart from overhauling educational administration and institutions this will call for overhauling the remuneration structure for those who do pure sciences and not its just applied versions. Now insight in physics, chemistry, biology will derive the commercial opportunities of the future. There is a need to encourage pure sciences so that it attracts the best minds, who should derive research and produce new knowledge from which commercial applications would emerge.

Quantum mechanics concepts have been applied in computing, communication and cryptography to mineral exploration and creation of new materials. Cell biology offers new ways to information technology, nanotechnologies that derive from new advances in chemistry and science of materials. Countries that do not generate capacity in these emerging fields of world clanging technology will be condemned to depend on countries and companies that do possess such capacity. India's approach to science education is complicated. At schools who excel in science and mathematics are pushed to engineering and medicines.

The basic research in sciences is necessary for technology growth and the social sciences help to understand each other in an analytical way. The Indian education system therefore needs a balanced approach and the academic world need a much better social recognition. The vision of the Prime Minister is therefore on greater academic autonomy, focus on research and need to nurture future generations.

Chapter 2

Indian Knowledge System

Kapil Kapoor

1.   Introduction.

Normally, we are used to narrating a phrase namely, Ancient Indian Education System, which in my opinion is a misnomer. I therefore, called our education system as Indian Knowledge System. Knowledge is never ancient or old. It is never defunct; the knowledge is very much alive. People target it, however, others discover it later. It is a cycle, kal chakra. The knowledge is in mind and imparted through narration. India has at least 28 cycles of loss and recovery. The vocabulary of India is very rich, only people hesitate to use it because they don't understand the actual meaning.

Indigenous traditional knowledge is an integral part of the culture and history of a local community. It is evolved through many years of regular experimentation on the day-to-day life and available resources possessed by the community. According to Gadgil, it is a cumulative body of knowledge and beliefs handed down through generations, by cultural transmission about the relationship of living beings including humans with one another and their environment. It is unique to a given culture or society. The existing knowledge gets broken by national and international disturbances. Sometimes the words become obscure. The knowledge however comes back through oral tradition. We know that Rig Veda was lost but it was reconstructed. Max-Muller sought to understand Rig Veda, the most ancient vedic scripture and translated the same in English. In my opinion Indian renaissance did not take place in Bengal but in Britain, where Max Muller devoted himself to the study of vedic scriptures.

2.   Rig Veda Essence by Max-Muller

Max Muller was a German born philologist and orientalist, who lived and studied in Britain for most of his life. He was one of the founders of the world academic field of Indian studies and the discipline of comparative religion. His book RIG VEDA SANHITA was published in the year 1869 in London. According to Max Mueller, Vedas are the oldest text of human race and "Agni Meele Purohitam" is the first verse of Rig Veda. In the most primordial time, when people did not know how even to cover their bodies and lived by hunting and housed in caves, Indians had attained high civilization and gave the world universal philosophies in the form of vedas.

3.   Indian Vocabulary and Sanatan Mind.

There are periods in the history when knowledge becomes trickle. However, great people revive it. Swami Vivekanand, in his Chicago address, revived essence of Indian knowledge. During the British time and in post –independence India, we were forced to adopt the present university system. Our universities and the people hence become island, without representing a united thinking.

Indians used to possess a Sanatan Mind representing a coherent approach. We have the first book, first prose, first poetry, first mathematics. Our great people created zero and the numeric system (called hisey in Arabic meaning Hind Se), which is often merited to the Arab world. Even President Barak Obama said that without your contribution, there will be no contribution by the present scientific world. We ourselves suffer from inferiority complexes.

4. Contemporary India.

Knowledge and tradition in India have remained alive. Ordinary Indian is intact. Travel in India and you will encounter people with old faith and tradition speaking their languages. Old Indian texts can't be introduced in the Indian universities because teachers can't teach them. In the modern context, people opt for education to get jobs. No education in India is complete without ethical purposes.

Nowadays there is a fashion for management education. Management is taught to get maximum benefit. They are taught manipulation. We need to think about our own education system, which is meant for welfare of people. Our subjects like Ayurveda, Charak Samhita and Ved Gyan are about medicine, food and intellect. About "Ayu" means age, we have two scripts; one is such Ayu and the other is "Hit Ayu". The first one is that when one is young and enjoy good health, he works for himself. "Hit Ayu" refers to the age after youth and this period is meant to work for others. In the Indian philosophy there is unit of consciousness.

5. World Religion and Cultures.

In the world, there were only two knowledge cultures, namely Ibrahmic (Hibroic), the source of which is Judism. The other one is "Vedic". The Ibrahmic believes strictly in one God, one language (strict monism), harmless (Not Nirgun). Hibroic God is an angry god. Islam and Christianity originated from Judism. The vedic culture believes in multi-god thought and religions such as Sanatan, Jain, Buddhism & Sikhs originated from vedic culture. The essence of vedic culture is in Gita's one sentence; You, Yourself, are your enemy or friend. No one else is responsible for that. India looks for transcendental system, not monism.

Chapter 3

New and Samarth India through Higher Knowledge Education

—Perspectives, Challenges and Opportunities for New India

V. Prakash

It is very important that India's Higher Knowledge Education, I would say India's Evolved System of Knowledge Education had an eye from the imperialistic rule and Lord Macally's dictum of destroying the fabric of India's education mandate did not shatter it but conserved and consolidated it infact. It was difficult to capture India and win over India of what the British were trying to achieve just on this agenda. This was attempted very effectively through divide and rule. Our own system of education which of course almost succumbed to the several diverse issues within ! Even after nearly 70 years that fabric that was torn apart is now retailored and re-established to be clearly re-understood as to the nature of the thread, the chemistry of intertwining the thread, the art of education through such a fabric and the social and professional knowledge that need to be used for long lasting fabric and more importantly the sustainability of the fabric over the "climate change" of the rulers till 1947, perhaps formed the basis of this one day Seminar organized by ITF at New Delhi on April 5, 2017 for future guidance to policy makers.

Let us examine the strong Traditional Educational System which has sustained for over 5000 years (as per documentation) as to what its contains. To address the Educational System with a modern touch by the Sampoorna Unnata Shikshan is important. Why do I say this ? This system had embedded itself into the following SEVEN areas of Shikshan. They are :Shuddha Shikshan, Swasthya Shikshan, Swaccha Shikshan, Samarth Shikshan, Shreshtha Shikshan, Samaja Shikshan and Shaswatha Shikshan. Thus the Sapthaswara Shikshan can create music, the number of songs and tunes and melodies with both several lyrics of width and depth maintaining the dignity and Soumya of education. This was also focused in a holistic and integrated way with interdisciplinary networking. Through these seven strands of higher education which perhaps forms the basis of several pitches, notes, tones and rhythms which can be produced lifelong, generation after generation ,but to sustain and nurture it is not an easy task. Today with the modern infrastructure and with super rapidity of transfer of data and the skill of the human resource and the second to second updating of knowledge, speed of learning and speed of dissipation, these marvels of Sapthaswara of Education can be taken to the highest level as a role model globally from India's distilled wisdom but the new India's System of Higher Knowledge Education can be carved from such a heritage combined with modern approaches.

The research and development in India has achieved a very high degree of advancement barring some of the problems of money dominating over value education, mushrooming of journals and in many places innovations being lacking and some of the educational institutions running around to distribute degrees with high priority of real estate and of course capitation fees etc. But we are still doing very good research which is commended by International peers and may not always been Internationally recognised as some of them may not know the history and wisdom and distilled knowledge of India from past 6000 years and the linkages of the Research that we do in those areas. New infrastructure, new era of IT and BT as well as the so called management techniques(which claim to go beyond Chanakya's Arthashastra !?) and in the area of food, lack of quality of documents of recent origin but the 2000 years old document such as Aharadhikaranam, Bhojanakutuhalam have sustained so well and in the field of yoga thus hailing the value of Patanjali Yoga Mudra and Sutra

which has yogic experience and practice captured over thousands of years for health, wellness and mental support for the physical body. Can we not call this higher education?! In this context if we perhaps address the Indian System of Higher Knowledge Education, several things come to our mind are documents that today we are left with and is important to address the issues of education vs. skill, village reach out to mega problems being solved locally in urban areas, upgrade education and skill dynamically for every profession (after the convocation degree updating has been normally zero in our system)till the retirement age magic rule of 60 ~ 65 years thus making the experienced people not available even though they are strong and what happens to their resource of experience some thing of the order of 40 years plus? This is not to interfere with innovation of youngsters but to support in making the experience available with fundamentals and value addition to the education system. These are some of the issues which are required to be addressed at a national level and the distilled wisdom must evolve as a quick policy.

Cost of education, gender bias, affordable higher education for all, the competition nationally, domination of English and urban population in higher education, facilities for rural to participate in urban Institutions, private -public – partnership for rural would be win– win situation against urban recognition for skills and the real estate gobbling in the name of higher education need to be put an end to rather than being mute spectators. Vertical, efficient and organized infrastructure are the order of day with discipline, opportunity to learn and experience and the importance to both arts, social science, science, medical and engineering and commerce and of course management and political career training at a higher level (is also desired as higher education !)with a holistic and novel way with new and networking approach is important.

An example is that of an agricultural Scientist and growing of paddy and the farmer who has 50 years of experience in growing paddy (in practice latter can also advise the former – but it happens only one way)! When and how do we change this ? Midcourse correction to re-orient higher education for reaching national goals rather than making it through a predominant syllabus based and exam oriented need to be re-examined and changes brought about immediately.

There is absolutely no avenue of specialised higher education such as for Professionals such as auto drivers, taxi drivers, train engine drivers, trucks and bus drivers and lorry drivers but perhaps there must be higher knowledge imparting systems for renewal of license for all the above drivers similar to Pilots of aircrafts frequently. This needs to be considered and revisited. The above needs to be focussed and examined from time to time to gain knowledge just like Dr. Varghese Kurien's model of veterinarian going to farmer for the cow rather the other way round in the Dairy Sector which brought about a revolution as we now proudly target 200 million tons of milk production by 2020. Perhaps knowledge to gain and train them to empower them as safe drivers, honest drivers and proactive drivers with courtesy to other drivers and consumers would emerge automatically and is the real benefit one sees from such a model of higher skill training and education.

Opportunity for higher Knowledge education in medical, engineering, business management (where is the higher education for politicians or policy makers or even planners ? !) is important to update the knowledge in every field so that we have India transforming into New India with most modern knowledge sought out around globally. What about drop outs from under graduate to graduate to post graduates from the Colleges ? Where are they going ?Are we as a nation continue to certify degrees based on attendance in class or on the skilled certificates which is practical and ground reality which is neglected ?For example doing a total of about 15 years course on yoga and getting a Ph.D, degree perhaps hardly a few people have done it so for. The rest of the 99% take of course

validated classes, get sound knowledge from experienced yoga teachers and do it the right way and it is our Hon. Prime Minister who took the initiative to convince the globe and United Nations for declaring International Yoga Day and the entire world practices it and 99% have noPh.D degree and the so called higher education is in a different format.   Because they don't undergo the so called modern aspects of higher education does not mean that they cannot practice it right and they cannot teach yoga to others as they do not have degrees ?! However higher learning educational centers in Yoga are needed so that India does not lose the leadership.

The art of tradition, the knowledge of tradition, the wisdom of tradition is not only being the subject ridiculed by many, but to use it properly with a Scientific bent of mind and scientific temperament is most important. For example, Ayurveda and the media coverage that Ayurveda preparations contains toxic metals, processed foods vs. fresh items; the ban of ghee in houses as it will cause heart attacks thus depleting of nutrients to myelin sheath of brain and thus affecting the brain; the discovery of Dwaraka, the fossils of Nagpur reverberating the presence of sea there, the changed course of river Saraswathi are good examples of scientific interface and delivery of answers through science and technology which has helped many bright lights turned on with the traditional knowledge and we already had and science supported with its tools. This is what perhaps is the distilled knowledge of the wisdom combined with science based approach unique to India.

As some of the traditions were shown to be 100% working and others could not find firm substantiative evidences and not that they are wrong, perhaps we need finer tools and models to reach the levels of knowledge that is needed to understand them. For example Nanotechnology has opened up many vistas hitherto and only belief was there and now proof is also available (ex. curcumin sand particles in oil). Several examples such as Adams bridge, the role models in herbal and yogic healing are all investments at the highest level of education rather than searching for problems before aspiring to go to the west in search of some of the Traditional Wisdom than understanding our own problems with adapting modern Science and Technology and models available for society betterment.

India's limited funds for research forcing us to set only priority agenda (example role of spices and Alzheimers disease, role of asafoetida in preventing H1N1, the role of speciality foods in different seasons based on Bhojanakutuhalam, Aharadhikaranam, Charaka Samhita and Sushruta Samhita has to be rediscovered and revisited and reoriented using the highest of science by allocation of ample grants and even if some of them does not give expected results it will at least clarify the good, the better and probably the best of the better ! Why are we still lingering on this decision of course with Scientific temper built into it decades after decades ?

Therefore in supporting higher knowledge education to be in par with the world of engineering, medical, technology (space, cyber, IT, BT) and environmental what is needed is support from all fronts for India's agenda. But to carry on India's Knowledge of the 6000 years of perpetual, distilled, filtered wisdom and knowledge from generation to generation cannot be thrown out of the window as telling there is no proof that such a thing has happened ! Lots of opportunities and challenges are there and it is important that knowledge come from all sources and let us use it for the good of society.

Whereas higher knowledge education for training people in local languages need to be focused either for oratory or skill to convey the messages on a topic which is relevant to public the attempts to establish such systems are missing. It is this experience of hearing others that is equally

important as that knowledge is profound and is indeed ready to use coming from centuries of experience.

However if we attempt to neglect science or tradition and vice versa and not see together without realizing that when we combine these two we can be leaders rather than followers perhaps we will miss out many leadership ideas to the world and can only buy online later they costing several tens of times India's cost ! Are we ready for it ? The long range perspectives, challenges and opportunities for New India is in front of us and it is for us to capitalize to convert that to higher knowledge level education so that wisdom, experience and practical solutions is vetted by science based approach useful to society with the element of Innovation, cost and affordability is truly focused on. That is New India dream to forge into Make in India Sustainable Module for higher knowledge education beyond Real estate coated higher education candies but actually the time for emerging of 'Knowledge Estate' Systems to perpetuate sustainably with dynamism.

Chapter 4

Problems and Solutions for Higher Education with Specific Reference to Technical Education.

Yogesh Singh.

1.   Introduction.

First of all my apologies, that I could not understand the expectations of the organizers, and hence, I have not come prepared with a formal presentation. However, I will share my experiences with you, which I had in my career as a teacher and now as an academic administrator. With reference to technical education only, people seem to be satisfied at least with the public institutions with some successful stories. However, we need to analyse the situation with holistic picture of higher education in our universities. We inherited the present structure and system from the British, which had several weaknesses. In the post independent India, the situation has became much worse and the bulk of universities have become only degree offering shops. In this presentation, I try to analyse these weaknesses and offer some solutions to the same.

2.   Status of our Universities

The foremost problems of our universities are that they are poorly funded and highly regulated. This is particularly true of our state universities, which cater to 90% of students enrolled for higher education In the central universities and central institutions the situation is better and there are examples of even rosy picture.

The Next important issue is that of autonomy. After independence, the various universities simply copied the act mainly from the British without making much effort to include Indian touch, culture and social conditions. In fact many good provisions of the acts of British universities were removed, that were concerned with autonomy and affiliation.

3.   New Acts in the Name of Reforms

Maharashtra government, recently, in the name of reforms designed a common act for all the state universities. Though the main objective was to provide more autonomy, but the bureaucratic interference removed all the institutional autonomy and everything has been made government dependent. The result is that a Vice Chancellor has to run from pillar to post for various approvals, getting the funds as well as for sanction of the posts. The most unfortunate part is that most states are considering the adoption of the same act. In fact own universities had much more autonomy before 1947 than in the post independence era.

Another big problem in many state universities is the affiliation. Application of colleges to a university is practiced in India, Pakistan and Bangladesh only. No developed country had the scheme of affiliation. Since the number of institutions affiliated to a university may be very large, it is extremely difficult to synchronize the academic activity. In the present system admission, teaching evaluation and placements are done by the different bodies. It will be much more beneficial and responsible if the concerned teacher teaches, sets the examination paper and also evaluates; the rationalizations can be done through central machinery as happens in the IITs.

4. Fading Student – Teacher bond and responsibility towards society

With reference to placements, an example my university (Delhi Technical University) seems to be doing well. Nine students got pay packages of more than 1 Crore per annum. One student, who is also a topper, got as a package of Rs. 1.25 crores. I decided to ask him some questions. On asking how would he intend to spend this huge money, his answer was that he will enjoy, by a big car, a house and he showed scant respect to the parents and to respect for the teacher, institution and even the society. The point I want to make is that we are producing selfish and self oriented citizens. Such students pose a danger to the social unity.

5. Faulty Admission Process

Our admission to professional courses, particularly in engineering and medicines, depends on competitive examination, in basic or life sciences, with no aptitude test. Due to limited number of seats we do need a filtration process. But the elements of interest and aptitude need to be introduced in the selection process. Many students therefore find it extremely difficult to do well in their courses, whereas the same students could have fared very well in the discipline of their own choices. We also often mix education and training. Education is holistic; whereas training is focussed to be trained for a particular job.

6. Curriculum & Teaching

The university rules & regulations and choice of curriculum are often drafted by scientists or bureaucrats, with a politician overlooking both. The curriculum needs to be designed by those who are in the teaching field and who are responsible for execution of the same. The present discussions are centred on CBCS, where 70% of the curriculum is fixed. In my opinion, our direction is wrong and will lead to many problems.

Another main problem faced by universities is the class room teaching, which a student find extremely irrelevant. According to them the teacher is only providing information that is available on the internet or in books. In my opinion, the teaching methods need to be changed; to start with practical followed by theoretical interpretation of the same. Our laboratories should be used as teaching spaces. One needs to make an enabling environment for the same.

7. Escapist's Attitude

When China, Korea and few other countries decided to establish world class institutions, they invited Noble Laureates and highly qualified professors to their universities with not limitation on salary. Additionally they sent thousands of their young academicians for studying and obtaining higher degree to best institutions in the world for five years. Bulk of them returned and contributed. The result is that Chinese and Korean universities are finding their position in first 100 best universities of the world. Israel has seven universities, all amongst top 50.

India unable to compete internationally created their own ranking system, known as NIRF. This does not help, because it is escapist attitude to run away from international competition.

8. Industry Interactions

Very few institutions in the country have association with the industry. In the developed countries, university laboratories function as R&D laboratories of the industry. In 1947, we created CSIR labs, depriving Indian institutions to have a link with the industrial development. CSIR labs

themselves are highly compartmentalised with negligible interdisciplinary research .Another myth of the government is the funds through Corporate Social Responsibility (CSR). This only encouraged the corporate to establish, their own private universities and institutions. Hardly any CSR fund is diverted for R & D use in the public institutions.

9.   Conclusions

Our university system is poorly funded and highly regulated limiting academic flexibility and shrinking autonomy.   The regulatory bodies like the UGC, AICTE, MCI etc have become more stumbling blocks.   The state government departments, managed by bureaucrats, have a tendency to control. The teacher has become weak with negligible say in academic planning, curriculum development, evaluation and research participation.   The student-teacher relationship is weakening and the young graduates are becoming self centred.   The whole system needs reforms which should result in restoring the teachers' confidence and providing the much desired autonomy to the academic institutions.

Chapter 5

Inter-linkage of Society and Education in India: Challenge of Tackling Growing Alienation.

Arun Kumar.

1.   Introduction.

I will start my presentation with a brief background of mine, because of very contrasting pictures of the educational institutions that my parents and myself have served. I got my education in a different subject and later became professor in another subject. My father was a professor at Allahabad University in 1946 and my mother taught at Lady Shri Ram College of Delhi University and retired in the year 1993. My father has seen the decline of Allahabad University, while my mother has seen the rise of Lady Shri Ram College, which was started in the year 1963. I studied Physics at Delhi University, which is considered to be a very good university and later joined Princeton University for Ph.D. I experienced a huge gap between the two institutions, namely the DU and PU (Princeton). Later I did Ph.D in economics from the JNU and became professor in the economics at the same institution. Since the year 1987, I have been writing on Higher Education and my two articles were published in the Economic and Political weekly. The articles had raised the issue of Autonomy and Accountability in Higher Education. Higher Education in India confronts a variety of challenges that need to be addressed to identify the complexities involved and to evolve a democratic model.

In this communication, I address the issue of education as a whole, vision of the society, the New Education Policy (NEP), identification of key problems and concerns in general.

2.   Education as a whole

What is the meaning of education and what is its role?. The basic role of education is to pass the knowledge from one generation to another.   The students should have the opportunity to be taken to the cutting edge. The main crisis in higher education today is the creation of knowledge. The emphasis has been more and more of specialization in the individual fields; the inter-discipline inputs have been missed out. Knowledge needs to be socially relevant and it should be able to excite the students. There is a need for dynamism in higher education and within the institutions.

Colonial rule in India disrupted the dynamics of its society. Getting a certificate, diploma or a degree has become the priority without bothering about acquisition of knowledge, skills or any other competence. There is a wide spread cheating in examinations, availability of fake degrees. The jobs are lacking on one hand and on the other hand the Industry is complaining about the non-employability of the so called educated youth. Our Universities and other educational institutions have completely dynamism. We don't have a single world class institution in the country. The whole generation of economist is missing and same is true of other disciplines. Teacher's voices are not heard and the status of educationists in the country is very low. The education policies are drafted by bureaucratized mind sets. Today's education is linked to markets. The emphasis is on making money. The career of students is framed by mechanical coaching like Kota Phenomenon. Today's degree is not a measure of learning but largely a passport to get a job.

3.   New Education Policy (NEP)

The NEP draft, loaded on the website of the MHRD exhorts ancient times at many places

citing deterioration in the present system. However, no analysis has been offered citing the reasons for deterioration. The policy also cited Gandhiji several times, but not able to connect the past with the present and the reasons as to why Gandhiji's dream is not realized. Gandhiji's view of education, as alienating individuals from the mainstream of the society, has its roots in the colonial period. Colonization over two centuries resulted in disruption of the society and narrowing of its social vision. Now this is further accentuated by marketization and growing illegality in society. Educationists presently lack the commitment to do what is needed by the society. They are mostly careerists who are qualified, but lacking in wider vision of education. The problems in education have to be solved on fundamental basis. There is a tendency for not calling the ideas of other persons. If one does not value new ideas than one does not value education. Our education system has deteriorated due to negative mind sets. When renaissance was taking place in Europe, in the field of education, our own ancient education system was declining.

4.   Gandhiji's view on education

According to Gandhiji's philosophy, literacy in itself is no education. Education, which does not teach us to discriminate between good and bad, is not complete education. I believe that religious education must be the sole concern of religious associations and not our schools or colleges. When I talk of spirituality in education, I mean the education of heart. The aim of university education should be to turn out true servants of the people, who will live and die for country's freedom. A balance intellect presupposes a harmonious growth of body, mind and soul. True education should be easily accessible to all and should be of use to every villager in his daily life.

5.   Problems with Policies

It has become a fashion to quote Gandhi and vedic systems in our education policies. However, there is no connect between the ancient times and contemporary times. Education needs to be dynamic reflecting changes that take place in the society, science, technology, mathematics. It is much above 3 Rs. (Reading, Writing and Arithmatic). Our policy makers have tried to gauge the academic performance by introducing API. They have tried to improve the Ph.D programme by introducing M.Phil. None of these have worked and M.Phil degree remains one of the most useless academic achievements of University System. We have a tendency to list problems without going into the basics. The solutions are suggested without integration amongst them.

Growing alienation of education in the society leads to weakening of their inter-linkages. Gandhiji said it is alienating – Sabhayasadi and the UGC chairman Prof. Thorat said the present day education is alienating especially for Dalits. Due to disconnect between individuals' interest and the education that they get, many flounder in IIT's or JNU and most research students face difficulties in conducting research. As a result plagiarism is on the rise.

6.   Perspective and Vision in Higher Education

The most important thing in education is the perspective and corresponding contents. A person may be literate but it can produce militant perspective or a literate can develop an elitist or consumerist or a short term perspective. Limited vision of higher education explains the challenges faced by the society and its view grading access, equity and accountability. Today the state wants to curb dissent, while the business wants cheap and low skilled labour curbing critical leaning. We must not teach only physics or economics but also critique of the existing theories. India is a segmented and a feudal outlook society, which is very well reflected in the school education having extremely uneven

quality. Higher education is getting more and more segmented. Its democratizing influence is waining rapidly. Due to historical continuity from Macanlay's policy, education is meant to produce clerks who can help in perusing government agenda. Our system has separated teaching from research and that is our bane today. I will here quote an Allahabad University professor, who publically said that we are meant for teaching only.

7. Education Policy – Historical Continuity.

Our teaching is mostly confined to class rooms and it is highly theoretical. Most students feel that it has not links with their lives and education is a mean to earn. Sir Richard Thane marked on the delivery of education at St. Stephens College, a leading institution in India, that the teaching here is not creative at all. It is an exercise of memorization without understanding. Professor Higgs, the inventor of Higgs Boson (a God particle) wrote in his biography that he did not publish any research paper in the first fifteen years of his research career. In the annual report he had to mention "no research publication" . In the 16th year onwards, however, he wrote a number of fundamental physics papers, which later earned him Nobel prize. In the present times it is very tough to survive in academics without publications even for a year. Our educational institutions and educationists have become highly bureaucratized and function from 10 am to 5 pm only. Academics have conceded ground to bureaucrats and politicians who have little idea about the need in education.

Two major shifts have taken place in the education policy in post-independence India. In1947, it was philosophical shift and in the year 1991, it was provided market driven dominant role. Marketization equates academic's work to factory or office work. One example of this, is the introduction of API. It is not possible to set up standards with standardization.

Use of the terms like human resource generation sound like mining minerals from mines and same is true with the word human capital. The critical aspects are autonomy and accountability, the terms that are either being used formally or missing in practice. Time frame for accountability is very long term; we however concentrate as short term. The university Grant Commission (UGC) has designed some courses and offered choice based credit system, which is finding stiff opposition from major stakeholders namely the students and the faculty.

Various organizations like the World Bank and the reports of Ambani, Birla, knowledge commission and subsidy report have been responsible for privatization of education as well as enhancing fee structure of the public institutions. This has resulted not only in the falling standards of higher education but also depriving the poor of fair chance to realise dream of higher education. All this has come due to lower conscience of profit making individuals. These individuals tend to grab any chance and don't feel guilty about things done purely to serve the self interest. This ultimately, creates atomized individuals working for self leading to abdication of social responsibility.

8. Educational Institutions and Leadership Crisis

Indians by nature like to be administrators with bureaucratized minds. As soon as an academic person gets a chance to be a Head of an academic institution, he starts functioning as a bureaucrat. I will like to cite the exchange of letters between Hill and Bhatnagar in this context. Professor Hill was a British scientist, who was asked to study the Indian Higher Education System. After studying the system, Hill wrote to Bhatnagar, the first Director General of the CSIR that you are destroying the Indian Universities. Dr. Bhatnagar wrote back and saying that the Indian Universities are already destroyed, because all Vice Chancellors are appointed by the politicians. Vice Chancellors

usually surround themselves with sycophants. Those with independent views are marginalised. Dissent is the essence and not compliance, but the bureaucrat in power suppresses it. Professor Gross a noble laureate from Princeton has written on the deficit of educational leadership in India. He argues that India has set the age of 60 years as retirement age, where as only at this age the person develops the quality of a leader. In his opining higher education needs radical reforms in this country.

In India, a University or school teacher has a very low status. The relational character of teaching and the taught is eroding rapidly. Inspiration given by a teacher to the student is declining very fast and slowly learning through teaching is not becoming worthwhile. The induction of students in to the community is weakening. The dignity of a teacher is highly eroded. The school teachers are absolutely nobody. Technology is being used to dispense with them. The control of management is tightening and the academic autonomy has come down sharply. Many teachers are being appointed in ad-hoc fashion and on part time basis eroding the quality of teaching. The introduction of API by the UGC has greatly eroded the teacher's dignity. Hence there is lack of commitment and there is focus on unwanted useless research.

The roots of the problem lie in the philosophical aspects of knowledge generation. In the post independent India, there is loss of value of ideas in society and also the loss of vision. The education is the basic need of a society and a nation. The education therefore ought to be low cost at our per capita income. We copy however western systems. Additionally this aspect has weakened the student-teacher relationship and additionally by technology and marketization.

9. Loss of Value of Ideas.

Normally our academic intuition lack cohesive approach and team spirit. The values created by our good intuitions are mostly individualistic elitists, undemocratic and consumerists. The examples are the IITs and IIMs. Once a student gets a chance to enter these institutions, he develops an elitist and consumerist approach with scant respect to the society. Elitism has become a part of our agenda and best served by privatization, because we want to copy modernity. Most of our current research work is in the elitist frame work. Even for the emancipation of the poor, the context has been put in the market framework.

The resources are always discussed by the scientists and academicians. The problem can however be resolved on the basis of our own vision. If the future is important, the resources have to be found. When we come to the shortage of resources, a general Indian and particularly the poor is short of resources with very poor income. If NSSO 61st round is correct in 2004-05, 99% of India spent less than Rs.80/- per day and 96% less than Rs.48/- per day. The SECS shows that in the year 2011, 96% of rural household spent less than Rs.10,000/-per month. However, in our system there is tremendous waste of trivia and ostentation in both public and private sectors. The centre has resources but the question is the national spending. Black economy in the country has resources, that are being directed to commercial use of higher education. In the commercialization, there is narrowness of vision in the managements and narrowing of democratic spaces in institutions. In general, there is lack of commitment to higher education in the society.

10. Conclusion.

The problems of higher education in India is basic, namely, the control of politicians and bureaucrats over the system. Academia needs to regain control over policies from non-academics. The higher education in the country needs autonomy from the state. We need to nurture good

academic leaders in the country. The teachers and the community face alienation, which need to be addressed. There is a need to re-energizes teachers, who should cultivate research with creative thinking and build link with the students. The role of teachers union in the academic institutions needs to be constructive and they should actively participate in finalising the contents of education. The main issues of concern today are the contents and essence of education and the delivery of the same. The heads of the institutions should encourage democratic functioning and should be accountable to the academic community. There is a general deterioration in student-teacher relationship, which needs immediate attention. The separation of teaching and research has resulted in rote learning and there is a tendency of increased plagiarism. There is a growing commercialization of higher education leading to corruption. There is an acute shortage of faculty with the result that ad-hoc and part time teaches are being appointed. The state needs to do due-diligence and enhance the education budget to 6% of GDP.

Chapter 6

Imperatives for forging future for New India – Response to Draft of New National Policy on Education.

A.K Singh

Introduction

I would speak on my inputs on the new National Education Policy. My paper has already been circulated and I don't intend to read anything from this. Briefly I would put my opinion on the NEP. In India, making a draft policy is considered to be panacea of all problems. Making a policy however is only a beginning. It has to go through a process of political will, push to the given market, bureaucratisation and ultimately the administrators and educationists. In fact the golden period of Indian education was, when there was no policy. It was during the period around 1882, when discussions were held to establish the first education commission for India. In fact since the ancient times, India has been a knowledge society. It is said that Greek is the most ancient knowledge society, but the number of manuscripts that existed in Sanskrit are more than the combined number of manuscripts in Latin and Greek. In fact the fundamental of Indian education have not changed much. This was much evident at Nalanda, where scholars and students used to come from all over the world to acquire knowledge, not for employment. The library of Nalanda was rich in space as well as manuscripts. It had three nine-storeyed wings full of Vedic, Buddhists, Mathematics, Philosophy literature and other manuscripts. In 1127, when the invaders destroyed Nalanda and put the library in flames, smoke was seen to be rising from the library, even after six months of the invasion.

With reference to the education policy in post independence India, Prof. Kothari comes to mind, when the first education policy was implemented in the year 1986. In the year 1992, amendments were suggested. In the year 2016 – last year, a new draft policy on education has been formulated by the MHRD. In the history of Indian education, two documents are of extreme importance. First is the Education commission report in 1942 by Dr. Radhakrishnan. In this report he dealt with different facets of education. The other document is a collection of various convocation speeches by Shri. Shyma Prasad Mukherjee, from 1934 to 1952. His convocation of 13th December 1952, at Delhi University is available. He clearly points the fundamental principles on which the Indian education system firmly stands namely:

- Merit based admission.

- Faculty student ratio 1:5

- Syllabus relevant to Indian Ethos and culture but with global diversity.

In our old universities and institutions, there were no political interventions. Financial support will come from local rich and from abroad (countries like Korea, Japan, China & others). Great scholars like Aryabhatta and others studied and taught at our great Indian Universities. The vice chancellors and the academic council had absolute autonomy.

Our traditional Indian Knowledge system put great stress on the education of adults, girls, on moral education, military education, vocational education and science & technology. Shyma Prasad Mukherjee in his convocation addresses had stressed the importance of mother tongue in education. One needs to provide study material. In his opinion mother tongue is catalyst to constitutions of ideas

and the delivery of the same. The modern Indian education has neglected India's glorious past. The new Education Policy (NEP 2016) does mention, terms like Vedic and Gandhiji, but drifts away from the main and intellectual contents of the same while drafting new ideas. Let the stake holders namely the educationists, teachers and students have a say in the New Policy before its adoption.

Chapter 7

New Pathways for Medical Learning.

R.B Smarta.

1.   Introduction.

I will be talking about medical learning in my presentation. There is a very good relation between education and health. While education help to make a person good citizen for himself and for the society. Health also contributes to a healthy citizen and healthy society crucial to growth and progress. We have a new health policy, which may bring good results if basic objectives are kept in mind. We also had an old health policy. However, I have decided to talk on the healthcare systems as a whole, where technology and healthcare meet the patient power.

2.   Inadequate Healthcare system.

We have extreme inadequacy of doctors and nurses. The doctor to patient ratio is very high, 1:9000 in urban areas and 1:35000 in the rural areas. The same is true with nurses-patient.

The details are given in Fig. 1.

Fig.1 Inadequacy of doctors and nurses in India

A study conducted in 2015 found that India has one government doctor for every 11 528 people and one nurse for every 483 people*

Doctors/ Technical Support Staff	Number in India	Percentage of Shortfall
Doctors	9.6 lakh	81%
AYUSH Practitioners	3.9 lakh	11.3%
Paramedics	16,73,337	21%

MISSING DOCS — Thousands of specialist seats lie vacant in various departments

TOP FIVE CAUSES OF DEATH	SPECIALIST TO TREAT	PRACTISING SPECIALISTS		PG seats - India		PG seats - US
		India	US	Current	Required	
Heart disease	Cardiologist	4,000	22,020	268	3,200	800
Diarrhoeal diseases	Paediatrician	20,000	56,262	1,200	18,500	2,640
Chronic lower respiratory disease	Pulmonologist	1,200	5,726	329	2,000	511
Strokes	Neurologist	1,100	13,156	171	2,800	700
Flu/pneumonia/TB	Pulmonologist	1,200	5,726	329	2,000	511

Source: The Times of India

*http://www.bmj.com/content/351/bmj.h5195

The second point is regarding the functioning of primary healthcare, secondary healthcare, tertiary health care and quaternary healthcare. Across the country, there are huge differences with respect to spending by states and the quality of healthcare. There is a huge surge in the private healthcare in the last decade and seems to be providing good service. Transparency and affordability are the main concerns. Another index of social issue is the human development attainment. In this category, all belonging to medical as well as paramedical group are counted; therefore it constitutes of doctors, specialists, GPs, hospital, medical service providers (nurses, pharmacists, paramedics) etc.

Primary healthcare is our first and most generalized stop for symptoms that are new to us or concerns that one has contracted cold, flue or other bacterial or viral diseases. Primary care may also be sought for a broken bone, a sore muscle, a skin rash or any other medical problem that might have developed. Primary care provider could be a doctor, nurse or a physician's assistant. Public healthcare system in India does not facilitate primary healthcare due to many constraints. Mindset of Indian

patients is not tuned to primary healthcare, needs lot of education and adequacy of medical infrastructure. Secondary healthcare starts when a patient is referred to a specialist after visiting primary healthcare. This is done to get better and specific medical expertise in a particular area. The Indian patient normally prefers to go to a specialist either because of his own experience or through referrals.

Tertiary healthcare requires highly specialised equipment and expertise. For such care, the patient has to be normally hospitalized. Coronary bypass surgeries, renal or haemodialysis, some plastic surgeries or neurosurgeries, severe burns or any other complex condition that requires intensive treatment or procedure come under tertiary care. Tertiary healthcare is costly and India today is the second best country to provide tertiary healthcare in the world.
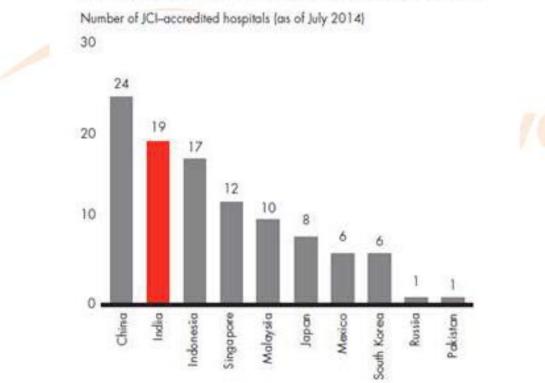
Fig. 2 ; leading world's countries providing tertiary health care

Number of JCI-accredited hospitals (as of July 2014)

Quaternary healthcare is considered an extension of tertiary care even more specialised and unusual. Being used to administer experimental medicine or procedure quaternary care is not available in every hospital or medical centre. Experimentation along with expertise is not very organised in our system.

3.   Focus Area to NHP work.

The percentage of non-communicable diseases in the country is increasing constantly 60% of the total patients in the county (Fig.3).
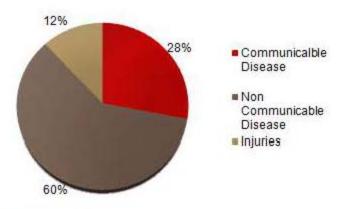
Fig. 3: Increasing burden of non-communicable diseases in the country

- **Communicalble Disease** — 28%
- **Non Communicable Disease** — 60%
- **Injuries** — 12%

Health is a state subject and in our country there are several inequalities as far as health services are concerned.

Fig.4: State wise inequalities in health outcomes

Disparities in States		
Indicator	States with Good Performance	States with greater challenges
TFR (2013)	West Bengal, Tamil Nadu, Punjab, Himachal Pradesh, Delhi	Bihar, Uttar Pradesh, Madhya Pradesh, Rajasthan
IMR (2013)	Goa, Manipur, Kerala, Pondicherry, Nagaland	Madhya Pradesh, Assam, Odisha, Uttar Pradesh, Rajasthan
MMR (2011-13)	Kerala, Maharashtra, Punjab, Tamil Nadu	Uttar Pradesh, Uttarakhand, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Rajasthan, Odisha

Source
TFR: Statistical Report 2013, Registrar General of India.
IMR: SRS Bulletin, 2014
MMR: MMR Bulletin, 2015 , Registrar General of India

Fig. 5 shows a system that should be followed for total patient care

Fig. 5: Total patient care system

Private healthcare industry in the country is expanding with strength. Current economic value of the industry is rated at $40 billion and its growth rate is 14%. It is projected to grow to $ 280 billion by 2020. The expanding industry will need capable doctors. But there are several problems like low doctor-patient ratio, outdated syllabus and teaching style, lack of skilled teachers, disparities in infrastructure across states and lack of social accountability.

4. National Health Policy (NHP)

In the new National Health Policy, many things have been loaded properly. The main aim of NHP 2017 is to inform, clarify, strengthen and prioritize role of government in shaping health systems in all dimension; investments in health organizations of healthcare services, presentation of disease and promotion of good health through cross sectional actions, access to technologies and developing human resources. The new policy also encourages medical pluralism, building knowledge base, developing better financial protection strategies and strengthening regulations and health assurance.

Goals of the NHP 2017 are to attain the highest possible level of health and wellbeing for all and at all ages to a preventive and promotive healthcare orientation in all development policies. Universal access to good quality health care services without anyone having to face financial hardship comes out as a consequence. This should be achieved through increasing access, improving quality and lowering the cost of healthcare delivery.

Objectives of the NHP are to improve health status through concerted policy action in all sectors and expand preventive, promotive, curative, palliative and rehabilitation services provided though public health sector with focus on quality. The key challenges of NHP and the growth drivers are given Fig. 6 and Fig. 7 respectively.
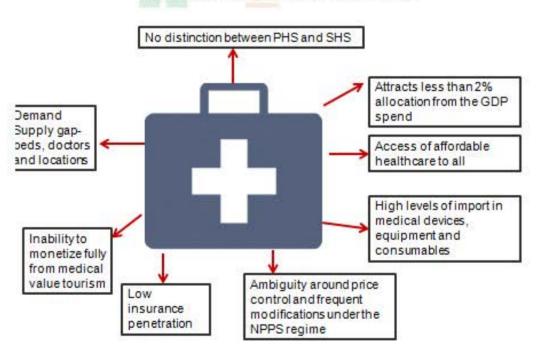
Fig. 6 Key challenges in New Health Policy

- No distinction between PHS and SHS
- Attracts less than 2% allocation from the GDP spend
- Demand Supply gap- beds, doctors and locations
- Access of affordable healthcare to all
- High levels of import in medical devices, equipment and consumables
- Inability to monetize fully from medical value tourism
- Low insurance penetration
- Ambiguity around price control and frequent modifications under the NPPS regime

Fig. 7: Growth drivers in health system
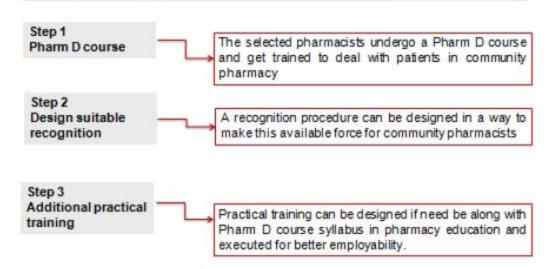
5. Human Development Attainments.

To address the issues of human development attainments, the government had to address the problem of :

- Affordable education.

- Structure education.

- Quality health care in rural India.

- Positive patent experience.

The approach should be to follow 7 pathways as depicted below.

Pathway 1: Community Pharmacists

Step 1 Pharm D course	→	The selected pharmacists undergo a Pharm D course and get trained to deal with patients in community pharmacy
Step 2 Design suitable recognition	→	A recognition procedure can be designed in a way to make this available force for community pharmacists
Step 3 Additional practical training	→	Practical training can be designed if need be along with Pharm D course syllabus in pharmacy education and executed for better employability.

Pathway 2: Primary Healthcare- Pharmacists

Primary issue → Low Doctor - Patient ratio.
Effectiveness of PHCs

Steps for Pharmacists →

As there are 670,000-700,000 pharmacists/ retail outlets are available inclusive of rural areas. This force can be properly utilized if designed education is provided.

Pharm D program of pharmacy empowers them towards PHC providers.

Government recognition to this program and practical training curriculum for these selected pharmacists will further educate them and make them employable to provide PHCV services.

Pathway 3: Primary Healthcare Providers

Primary issue → Low Doctor - Patient ratio.
Effectiveness of PHCs

Steps for Primary Healthcare Providers →

As there are already established PHC centers all over India, proper inventory management of medicines, follow-up and administration of these PHC centers for its effective use needs to be regularized

Special education program for PHC providers can be designed for their growth and higher responsibilities in healthcare hierarchy on the basis of contribution, growth of PHC centres

Pathway 4: Primary Healthcare Centers- Ayurvedic Doctors

Primary issue → Low Doctor - Patient ratio.
Effectiveness of PHCs

Steps for Ayurvedic Doctors →

As there are already practicing ayurvedic doctors in rural areas, a special education program can be designed for those chosen by selection amongst Ayurvedic practitioners and the number of PHC providers can be improved substantially. There is a conflict between modern medicine system and Ayurvedic medicine system, resolution can be solved for benefit of Indian patients and the course can be decided.

Appropriate syllabus, evaluation mechanism, practical training can be developed to deliver excellent PHC.

Pathway 5: Secondary Healthcare

Steps
Patient and Doctor community education

→ Awareness and patient education along with awareness of doctor community is essential to make distinction between PHC & SHC as it should not be only urban rural divide.

→ Accessibility & Competency of providers along with medical infrastructure inclusive of diagnostics.

Pathway 6: Tertiary Healthcare

Step 1
Develop Syllabus

→ Structure of the syllabus should encompass different knowledge and skills areas from different disciplines such as biology, psychology, sociology, nutrition and traditional medicines along with other related disciplines

Step 2
Harvard Medical Pathway – A role model

→ The New Pathway curriculum integrates the biological, social, behavioral, and clinical sciences over a four-year period.

→ **4 Goals**
1) to increase the rigor of the teaching of basic biologic and population sciences and to integrate the teaching of science and clinical medicine throughout the entire student experience;
2) to engage the faculty, including the most senior faculty, as teachers, mentors
3) to develop a new model of clinical education
4) New ways of teaching and learning

Pathway 7: Technology- Healthcare meets Patient Power

Steps
Technology- Healthcare meets Patient Power

→ New syllabus based on the help of software engineers lifestyle scientists and patients needs.

→ Education based on **m-health** is becoming a reality which brings patients physicians and disease in loop

→ New learning's should be developed in following areas:
- Artificial intelligence- tools out perform physicians in certain cognitive tasks
- Bioengineering and bio therapeutics (non cellular)
- Commercial products of Pharma grade stem cells
- Immune related therapies and vaccinology
- Autoimmune therapies
- Genomics sequencing
- Pharmacogenomics and their usage
- Computed Tomography (CT)

Chapter 8

New Trends in Higher Education in India..

Oum Prakash Sharma.

1.   Introduction.

India is one of the largest higher education systems in the world having about 757 universities, 23 IITs, 30 NITs, 25 IIFTs and more than 36000 colleges. Higher education has grown very rapidly during last three decades in the country. Enrolment has been growing at the rate of 20% and according to All India Survey on Higher Education (2010-11), the Gross Enrolment Ratio (GER) in higher education is 20.4 %. Distant learning constitutes about 12.5% of the total enrolment in higher education. There is however a question about quality of education. About 80% of engineering graduates remain unemployed. In the world university rankings 2016-17, there is no Indian university amongst the top 200. Need is to re-engineer in terms of quality of instruction, research and innovation, infrastructure and capacity building. A number of good initiatives have already been taken by the government as well as by some individual institutions.

A number of trends have been witnessed in teaching- learning pedagogy such as:

⬜   Towards open and distance learning.

⬜   Towards choice based credit system (CBCS)

⬜   E-learning and online courses.

⬜   Blended and web supported learning.

All these methods are tried towards global competitiveness in higher education.

2.   Open and Distance Learning (ODL)

Open and distance learning has become popular amongst students, who have missed opportunity to complete their courses in higher education because of one or the other reasons. Open distance learning is an alternative system of education providing affordable quality education, with in geographical reach and offers need based knowledge with sufficient openness and flexibility. ODL has inherent features of flexibility in terms of age, choice of courses, subjects of study, choice of medium of instruction, flexible examination system with credit accumulation facility allowing learners for self directed learning at the pace, place and time at the choice of the learners.

There are 15 open universities in the country and 45 directorates of distance education in conventional universities. Open University system was first started in 1982, when Dr. B.R Ambedkar open university was stated at Hyderabad on an experiment in the field of higher education.. Subsequently many other universities were started and now the ODL system has become so popular that 12.5% GER is covered by the ODL. In general, online learning, e-learning, blended learning are the technologies that are used for teaching – learning trends. By the end of 2017, the e-learning segment may have a turnover of $40 billion in India. Now, India is the third biggest market for on-line education in the world.

An education programme combining online learning with traditional class room or ODL mode of teaching – learning forms the blended form of learning. It requires the physical presence of

both teacher and the student with control over time, place and pace. It is being practiced in many colleges with the name of smart class rooms. IGNOU offers a few distance learning programs in a blended form with web support.

3.   **Towards Global Competitiveness.**

Indian aims to compete globally in imparting quality higher education. This calls for massive quality improvement in delivery with spirit of competition. MHRD has introduced National Institute Ranking Framework (NIRF) in higher education; this ranks the institution on the basis of fine parameters.

- Teaching, Learning and Resources.
- Research and Professional Practices.
- Graduation outcomes.
- Outreach and inclusivity and
- Perception.

Recently declared NIRF 2007 has brought vibrancy in the field of higher education. It will not only help students to chose a college or university of their choice but it will create healthy competitiveness among the institutes to perform better.

4.   **Technology Enabled Teaching – Learning Trends.**

The technology has enabled several models of imparting education in a professional as well as commercial way. The examples are Massive Open Online Courses (MOOCs), National Programme for Technology Enabled Learning (NPTEL), STUDY WEB OF Active Learning by Young and Aspiring MINDS (SWAYAM), SWAYAM PRABHA – Educational contents through DTH, Virtual Lab, Digital Library Inflibnet and Towards Bring Own Devices in Higher Education. MOOCs is basically is an on-line programme with emphasis on learning process rather than evaluation and accreditation. First MOOCs had emerged from the open educational resources (OER) moment in 2008. MOOCs make the learning process flexible, open and give freedom to the learners to select courses of their choice. MOOC is relevant to countries like India, because it is a mechanism to reach a large number of learners. It helps in offering high quality digital content and expert faculty from institutes like the IITs & NITs and the service is available to students across the country. It helps to overcome the problems of faculty shortage and lack of proper learning environments and infrastructure.

NPTEL is a joint venture of the IITs and IISc funded by the MHRD. It aims to improve the quality of engineering education in the country by providing free on-line courses.

The first phase, Phase I, was launched in 2003 and till February 2016, it has more than 994 courses to offer. It is the world's largest science and engineering content repository with more than 1928 videos. Each course is peer reviwed in order to ensure that the standards are maintained. Every course runs for a specific duration, at the end of which examinations are conducted in different cities. All successful candidates get an NPTEL certificate. More than 13000 students have completed NPTEL so far.

SWAYAM is again an MHRD initiative of developing an indigenous platform of learning aimed at hosting Indian version of MOOCs developed by different universities and institutes. The courses

hosted on SWAYAM are in four quadrants:

- ▢ Video lecture.
- ▢ Specially prepared reading material that can be downloaded.
- ▢ Self assessment test through exams or quizzes.
- ▢ An online discussion forum for seeking reply to queries.

Special efforts are being made to enrich the learning experience by using audio-video and multi-media and state of art of pedagogy / Technology. In order to ensure the production of best quality content, seven national coordinators have been appointed, namely:

- NPTEL for engineering.
- UGC for post-graduate education.
- CEC for under-graduate education.
- NCERT and NIOs for school education.
- IGNOU for post school students.
- IIMB for management studies.

SWAYAM Prabha- Educational contents through DTH are aimed at providing high quality curriculum based course contents to teachers, students, and citizens across the country for lifelong learning. It is operated through 32 DTH television channels. There is a new content of 4 hours every day, which is telecasted six times a day allowing one to choose the time of his convenience. It covers all subjects at all levels of education including school, under-graduate, post graduate, engineering, vocational courses as well teachers' training. Initially the programme is in English; subsequently it will be launched in several regional languages also.

There are several other technology based online platforms like virtual lab, UGC-infonet, digital library consortium and bring your win device (BYOD) offered by private and government forum for special purposes.

5. **New Trends in Evaluation of Higher Education.**

Besides formal semester and annual examinations systems, the evaluation system is also undergoing changes. Examinations are being held on demand. There is a growing approach towards instant testing and instant result, multipurpose digital question bank is prepared and the mandate has been given NTA (National Testing Agency) for conduction of tests as well as evaluation.

Examination on demand has its own merit of providing a candidate flexibility to appear in examination whenever one feels prepared for the same after minimum eligibility criteria. It reduces malpractices in the examinations as each student may get different set of question papers. It also improves the reliability of examination and make evaluation a continuous process reducing load and stress on the students as usually happens at the end of term examination of a University. The registration for on-demand examination is completely on-line ensuring automatic receipts of entry to hall and provides an inbuilt mechanism for checking the authenticity of the students' data, eligibility for examination, validity of admissions. It is a safe, secure and cost-effective efficient process. It is capable of generating individualized and parallel question papers on the day of examination picking

up questions randomly from the question bank. Though each student gets a unique question paper, various question papers are of comparable difficult level. The system has centralized control and monitoring of the whole evaluation process starting from registration, teaching, examination & declaration of results.

The instant testing and instant result has all the benefits of examination on demand held digitally and on on-line basis. With respect to multi-purpose digital question bank, a variety of efforts and tools are required for successful execution of the system. A variety of tools are to be developed on regular basis,. The process of assignment preparation and question paper setting is time consuming and costly affair. Also at time experts are difficult to find. Increasing number of students and increasing frequency of conducting tests require more human resources. Solution lies in a centralized, multipurpose question bank having a large number of different type of questions in digital form specifying different parameters for each question IGNOU have developed a huge question bank for different type of examinations and assessments.

A National Testing Agency 9NTA) is being created to free the academic institutions for higher education like GATE, NET & others.

6.   **The Road Ahead.**

The success of the new initiatives to provide higher education to masses using digital platforms lies in capacity building of the faculty for implementing various schemes. It should be able to promote culture at all levels. Focus should be on learning rather than examination.

Chapter 9

Business Models in Higher Education in India

AdityaPrasad.

1. Introduction.

The higher education sector in India has gone through a remarkable transformation in the last decade with growing and dominating role of the private sector. Out of a total 789 universities in the country, there are already 260 private universities established through respective state legislature but funded by private institutions, group, or industries (Fig.1). Compared to the year 1950, when the country had only 30 universities, there have been 26 fold growths in the number of higher education institutes due to increasing demand in the country.
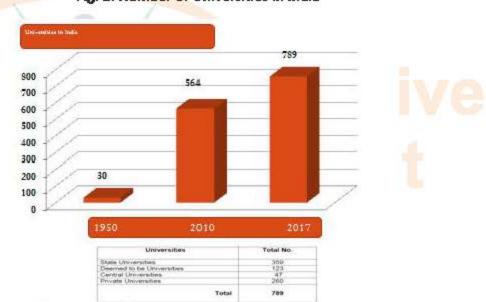
Fig. 1: Number of Universities in India

Universities	Total No.
State Universities	359
Deemed to be Universities	123
Central Universities	47
Private Universities	260
Total	789

The gap between demand and supply still exists and it is expected that the number of privately owned institutions will continue to grow. Though the private universities and institutions are established as not for profit organizations, but in the real world, they do earn huge amount of money not only for sustenance but also for profit. In this article various business models, which are practiced in India for higher education, have been discussed.

2. Model for Public Universities; Not for profit.

The main governing body at the higher level education is the University Grant Commission, a statutory organization established by an Act of Parliament in the year 1956. The UGC was given the authority for coordination and regulation of education in the Universities.

The Central government is responsible for major policies relating to education and it provides funds to the UGC, who further disburses the funds to the public universities. Central Universities are established by the act of Parliament as proposed by the Department of Higher Education, MHRD. On the recommendations of UGC, the central government declares educational institution as Deemed to be Universities as well. State Universities, public or private, are established through state legislation.

3. **Public & Private Revenue Model.**

The central government funds the Central Universities and autonomous institutions (IIMs, IITs, NITs & others) either through UGC or directly. The medical institutions & agriculture institutions are funded by the Ministry of Health & Ministry for Agriculture respectively. The additional revenues are generated by these institutions through student's fee, projects and consultancies. State universities are partly funded by the respective state governments & the UGC. State private universities are funded by the sponsors and by means of considerable student's fee.

The Indian higher education as discussed earlier is not in a healthy state. The gross enrolment ratio (GER) is low 23.6% as compared to world's average of 32%. There is relatively low penetration of higher education in the private space. Most students, particularly from private institutions, have low employability. There is an acute shortage of good faculty and there is very low industry –academia interaction. The institutions are not able to provide the required skilled workforce to the industry. Also, there is almost negligible recognition of higher education institutions globally. Also migration of students and adequate credit transfer from one institution to another is not possible presently.

In spite of the defined problems of the private sector, there are several benefits of existing and upcoming private providers of education. These institutions are able to provide personalised education and to some extent make reservation irrelevant. Many private & established institutions have industry collaboration, make use of technology in education and they are able to provide even quality skilled workers to the industry. Some of the leading examples of such intuitions are BITS Pilani, Manipal, Amity etc.

4. **Business Models.**

Many private institutions have developed good business models by providing multi-campuses leveraging their brand value, like Manipal, BITS, Amity etc. Some institutions have achieved reputation by offering and maintaining quality specialised courses like ISB, SP Jain & UEI Global. Some universities in the private sector have forged partnership with good foreign universities and segmenting global education provider like Ashoka, Bennet and Jindal Universities. A very good model that is being practiced in the provision of distance education; examples are Sikkim-Manipal, NMIS Global access & Symbiosis. Some universities have started study centres like ICFAI & Manipal Universal.

5. **Revenue Model**

The revenue model for self sustaining private universities is first of all high academic fee. An example, one private university charges Rs.6.75 lakhs per annum for University Law School, in sharp contrast to five year LLB course at National Law School of India, where the fee is only Rs.1.76 lakhs including residence. Some funding in good private universities comes from research projects through government agencies like DST, DBT etc. Also the faculty earns some industrial consultancies and/or in the form of joint projects.

Because of the law that an educational institution can be registered only as a not for profit organization, the investments in this sector are restricted. Looking at immense opportunities in this sector, many domestic as well as international companies have come up to provide educational as well as construction services to the educational institutions. This entitles them financial returns through two routes.

- Firstly, through periodic management fee by entering into a service agreement between the institutions sponsoring body and a company.
- Secondly, through dividends declared or interest paid by such companies depending on the nature of investment (equity or debt).

5. Foreign Universities & Unregulated Financial Model

Government has allowed 100% FDI in the education sector now. The foreign universities go for the ups with the existing Indian educational institutions for training programs and other services.

Fig.2: Revenue model for a forein university in India

- Government now allows a 100% FDI in the education sector.
- Tie-ups with Indian educational institutions for twinning programmes and other services

The foreign universities as well as existing private Indian universities now aspire to earn profits and take the following approach:

- **Unregulated business models**
- **Profit business model**
- **Innovative and global models.**

Unregulated business model consists of various modes like Tutorials/coaching centres, Language training institutions, Content and education service companies, Corporate training, Online distance learning / MOOCS (Massive Online Open Courses), Skill development.

Coaching industry in India is very huge. According to a survey conducted by the ASSOCHAM, 70% of parents belonging to various stratum from top to bottom in the social hierarchy are in favour of spending or donating considerable money to these coaching centres or institutions. ASSOCHAM'S estimates are that the annual revenue of the coaching industry is about 1 lakh crore and it is growing at a rate of 35%. The industry requires no registration by government bodies and there is no norms, no VAT. Initial Investments are only in terms of a small space, furniture and few ACs. Multi-city presence and early enrolments are strategies of a successful business model.

Another unregulated business model in education is the language training. According to British council, teaching of English language market is expected to grow in India. It is estimated that current market is about Rupees three thousand crores and it is expected to grow at a CAGR of 19 %.

Business to consumer (B2C) segment, about 80%, have the ELT as main focus area of their business. Multicity presence and various short term and long term training modules are approaches of their business model. Main players in ELT business are British Council, Inlingua, Dale Carnepe, McMillan Education and JULE.

Another component of University business model is the corporate training. The corporate training market is expected to show a vibrant growth, with revenues to reach Rs.32 billion by 2020(Ken Research). The industry is likely to be driven by the emerging MSMEs and start ups. Companies obviously are interested in training programmes customised to their business needs. There have been several tie ups between corporate and educational institutions for personalised training based on long term contracts.

There are many entities today who act as content and service providers linked to smart education and learning market. Digitization of educational content is an overall trend in education nowadays. All areas are encompassed like: skill development, technical courses, medical and life sciences para-medical, management, law, IIT courses, diploma course etc. Digital learning market size has grown to almost USD 193.24 billion at a CAGR of 24.84% and expected to reach USD 586.04 billion by2021. The trends are long term contract & global offerings in tie-up with educational institutions. Major vendors in this area are Adobe, Blackboard Inc, Educamp, Cisco Systems, Mc Graw Hill, Desire 2 Learn, Samsung Electronics, Sum Total Systems, Smart Technologies, Tata Interactive Systems and Saha Software etc.

One of the other promising areas is online education leading to a formal degree or certification. Known as MOOCS, the present on line market in India is USD 20 billion and it set to grow to USD 40 billion soon. The key factors are increasing personalized demands, large outreach and internet penetration. There are both modules, short term as well as long term. Some players in this area are Simple learn, Edukart, Eduvidya, Coursera, Edx and SWAYAM.

Another successfully driven area is the skill development. Skill development is key to productivity and growth reaping the demographic dividend in the country, where 60% of people are under 35 years of age. The overall skill development market is estimated at USD 2.52 billion and expected to grown to USD 20.5 billion by 2018. The business model lies in multicity presence customised offering and mass training. List of few companies in this area are NSDC, IL&FC Skills, Skillsonics India, Eduskill, NIFT, APECH & CENTUM.

7. Conclusions

The higher education sector spending is presently over Rs.46,200 crores (USD 6.93 billion) and it is expected to grow at an annual average rate of 18 percent to reach Rs.232, 500 crores. The various issues that need to be addressed simultaneously are extensive capacity building, digital learning, international experience, early stage researchers, education management, employability, technology and research collaborations and incubation centres. All these activities in a coordinate manner will drive the potential growth of Indian Higher Education Sector. Opening of Higher Education to the private sector entities and for profit will mark the beginning of a new era in Indian Higher Education space.

Chapter 10

Learning via MOOC's: a PANDORA'S BOX or a CORNUCOPIA

Kamal Sharma

ABSTRACT : Massive Open Online Courses (MOOC's) are the most advanced avatar of the evolving distance education universe. Since 2010, the finest minds in knowledge creation at the world's best universities have developed a networked platform to make available on-demand audio-visual instruction lectures globally. These are available with/ without payment and/ or certification. The reach, universality, access and cutting-edge knowledge from world leaders across a vast range of topics / issues from all corners of the world's universities is simply outstanding. Given the vast expected improvements in broadband availability, the scalability of MOOC's cannot be in any doubt. The structure of knowledge, the clarity of visual presentation, the precise explanations, the caliber and contemporaneity of the teacher are truly world class.

From 2011 to 2014, some 25 million 'students' have enrolled for the top end MOOC's courses. Only some 4% of those who actually commenced a course finally completed the entire course. ENCOURAGINGLY, 72% of these reported career benefits and 61% reported educational benefits.

The issues to be addressed are

a] INTEGRATION & MAINSTREAMING : Enhancing awareness of MOOC's for lifelong learning, skill enhancement and Career advancement

b] RETAINING LEARNERS: Retaining increasing proportions of initiators till the end of the total module /course /exam / certification

c] CRADLE TO GRAVE LEARNING: Extending the MOOC's platform from nursery to secondary level and beyond to overcome the problems of skilled / motivated teacher shortages and absenteeism

d] REACHING BELOW FOR EQUITY AND SOCIAL JUSTICE : Making lesson plans available in vernacular / neglected languages

e] MONETISING FREE / PUBLIC GOODS: Evolving fund raising mechanisms to enhance access for remote groups in inaccessible areas

f] ENFORCEMENT OF POSITIVE HUMANISING GOALS: Ensuring that incorrect information, pedagogy, etc is not broadcast or misutilised

g] AIMING FOR LARGER SOCIETAL GOALS: Enabling the MOOC's platform for social / financial / hygiene / health awareness programs.

h] UNIVERSALISATION OF GRADING: Developing a credible, equitable and valid system of grading with transferable credits

i] FORESEEING AND OBVIATING SOCIAL ILLS: Preventing Isolation & encouraging Social Interaction and Group learning as MOOC's is a lonely and self-paced methodology

j] BLENDED LEARNING : A practical approach to test the impact and evaluate the success rate.

k] INTERNATIONAL STANDARDS : The effect of extensive use of MOOC's in India would be to force Indian Curriculum to rise to International BEST standards or loose students to superior cost-benefit providers.

The advantages of the MOOC's technology are enormous. It is a cornucopia which needs to be targeted precisely, given credibility and funding and prevented from falling into the clutches of undesirable ideologues. Four individual cases are assessed and certain recommendations arrived at for the Indian environment of vast, differential reach, poor connectivity and poor primary education levels.

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MY PERSONAL EXPOSURE TO MOOC'S : In all my regular teaching classes, I repeatedly inform in detail about availability of all types of free online learning resources, starting from the Facebook, Google, Bing, Microsoft courses to FLIP, FPSB, from BSE, NSE, ICICI,, webinars from Digital Vidya, Fhysics, etc and I also email a detailed list of the business (finance & marketing, list enclosed) courses by the best US universities on EdX and Coursera platforms. I also encourage students to look at the dynamic websites of the 50 Museums in Delhi. This exhortation is repeated regularly in person and by email.

Since, the response of all these 'learners' was discouraging (they all have unlimited net access in college, hostel and in their laptop, paid for by the management), I made a search on the net to enquire into the quality of learning resources, visited content creators, attended seminars and searched on the internet.

Finally, I discovered a large focused study at the Harvard Business Review titled "Who's benefiting from MOOC's, and Why?? " https://hbr.org/2015/09/whos-benefiting-from-moocs-and-why

In the largest ever coordinated user survey of MOOC's, a questionnaire was emailed to 780,000 users from 212 countries all of whom had completed a Coursera MOOC. Of the 52,000 who replied 58% were male and 58% were employed, 22% were already students and 83% had at least, a Bachelor's degree, 60% had a full time job, and 73% were from richer countries. The median age was 41, and the 25th and 75th percentile was at 31 and 55. More than 21 lakh learners have completed a Coursera course from 2012 till April 2015.

It is correct to state that only 4% of those who actually commence a MOOC stay the whole course and complete the entire module and receive a credential. Of The 4% who completed a MOOCs 72% of them reported career benefits and 61% reported educational benefits. How is it that a technology platform / innovation, available for free and universal / economical access has become a tool for the educated rich in the wealthier countries and the benefits have not accrued to the unemployed poor in the poorer countries while the opposite result was expected.

This is what I have tried to explore and explain, on the basis of my personal effort over 5 years with hundreds of students (and a hundred corporate trainees), to promote MOOC's for education, career, enhanced job prospects, entertainment and failed comprehensively. I am in good company in my failures as Bill Gates in 2010 and Buckminister Fuller in 1961(see below) also failed entirely in predicting the minimal success that MOOC's would achieve.

I have spoken to students, assessed their responses, and delved deeply into the causes of

their lack of interest and commitment to an 'easy', 'available', 'cheap', 'zero-formal documentation', 'freetime', 'stress-free' option to enhance learning, career, income along the 11 points listed below, and included my recommendations therein.

"In 2010 June, BILL GATES said that the traditional means of getting a higher education at universities--especially the place-based institutions--will dramatically change over the next five years. "Five years from now on the web for free you'll be able to find the best lectures in the world," he said. "It will be better than any single university." In spring 1961, the American architect BUCKMINSTER FULLER told a group of Southern Illinois University administrators that a new campus they were planning would soon be obsolete. He informed them that classroom learning was finished. Instead, students would gain knowledge through "an intercontinentally networked documentaries call-up system, operative over any home two-way TV set". All the world's great ideas would become freely accessible to anyone anywhere, instantaneously elucidated by the world's foremost educators. And he predicted that forward-thinking universities stood to benefit because educational automation was "the upcoming major world industry."

a] RAISING AWARENESS OF MOOC's BY INTEGRATION & MAINSTREAMING : Enhancing PERCEPTION / awareness of MOOC's for lifelong learning, skill enhancement and Career advancement.

Integrating MOOC's into mainstream education from Nursery to College for its advantages in attaining a] uniformity & higher standards across schools and regions after approval by a voluntary /cooperative vetting authority, b] it overcomes shortages of trained, motivated, absent teachers c] upgrading the lesson plan regularly by a core group and enabling teachers training from a centralised studio to equip them better d] improving understanding of concepts through animation at an age when brain is growing rapidly and absorption capacity is at its highest e] understanding / knowledge being cumulative, the improvement is learning faster in higher classes is enabled f]enabling of rapidly reaching global best practices in pedagogy, curriculum, lesson plan as per best teaching practices worldwide (Denmark, Finland).

Once learners are familiarized to AV, webinar, video, podcast at an early age, their apprehensions are overcome and many can seek instructional material for their career, business, learning and indulging in their interests. Debottlenecking the teacher shortage is possible via MOOC's and the focus of attention shifts from 'teaching' to 'learning'.

MOOC's is all about empowering (freeing) learners from tyranny of space, infrastructure, teachers training, schedule, common pace of learning and facilitating self paced quality learning at a private space at affordable cost in learners convenient free time.

b] RETAINING LEARNERS: Retaining increasing proportions of initiators till the end of the total module /course /exam /certification

The large study of the MOOC's learners shows that less than 4% of those who actually started the course went on till the very end and completed it!! My experience & exposure to high-quality audio-visual learning reinforces what the above user survey has highlighted. Due to vast exposure of the youngsters to smartphones and their limitless and free consumption of songs, movie clips, sports action clips, AV content is equated to entertainment and not evaluated for its educational value. Since all learning is regarded as a duty enforced by authority and not as a tool for empowerment and career progress, educational content continues to be discounted/ avoided. Therefore as part of the regular

school lesson plans, introduction to the massive online AV, Webinar, MOOC's courses needs to be regularized, for which the teachers / mentors need to be proactive. These teachers need to inform and emphasize the access, excellence, low cost, and career progression at all levels via MOOC's. Short, AV lessons on scientific facts, geography, nature, cosmos, can be shown in lower classes for familiarization with the medium. These classes are to be strictly monitored so that learners don't become overly dependent on these and avoid sports and socialization. Reality (human interaction) is to be the main medium while virtuality (learning via all electronic mediums) is to be supplemental only.

Non-academic curriculum such as social responsibility, personal hygiene, punctuality, civic duty, manners & etiquette, duties of citizens in a democracy, universal brotherhood, behavior in public spaces, treatment of 'others' can be shifted entirely to AV and can be enforced by repetition. Such repeated exposure to AV content (online MOOC's or offline shorts), can heighten awareness of the availability and utility of 'free' AV online content.

c] CRADLE TO GRAVE LEARNING: Extending the MOOC's platform from nursery to secondary level and beyond to overcome the problems of skilled / motivated teacher shortages and absenteeism.

LIFESKILLS (soft plus domain) need to be imparted early and continuously as opportunities, skills, newer technologies and software tools are being released continuously. To keep abreast of these new avenues, it is necessary to be aware/ seek / learn of opportunities for advancement. For instance online courses from Google Analytics, Microsoft, Yahoo, facebook and others are free, self-paced, credited by them and to be used to market their services and much in demand by employers. Similarly online resources on learning, speaking, conversation, reading in English widely available. Financial Health and Retirement Planning, Insurance and Saving have all to be re learnt with many new instruments of pension, SIP, ETF, emerging regularly. No individual can have the time to seek, register, pay, and travel to learn all these new techniques /skills in reality. Of necessity, these have to be learnt at leisure, in private space and time at self paced intervals. MOOC's (which is one variant of AV's net resources have an increasing role to play in every day of a learners life from cradle to grave.

d] REACHING DOWNWARDS FOR EQUITY AND SOCIAL JUSTICE: Making lesson plans available in vernacular / neglected languages

For India, which has over 12 major languages (spoken by over 10 Mn persons) and another 30 minor languages, there would be a great saving of time, finance and teaching resources if the same visual lesson plans can be subtitled and transliterated rapidly into each of the 12 major languages. Since infants and young kids learn, imbibe and internalize best in their mother tongue, we can start to teach them personal hygiene, civic consciousness, literacy and numeracy, social responsibility in their language and switching to the languages of science and commerce in later classes. Manual and technical skills can also be imparted in local vernaculars at lower cost while higher order science and globalization and international needs can be fulfilled by most suitable languages (languages required for commerce in future shall be Japanese, Chinese, Korean, Russian and Spanish). The availability of lesson plans in mother tongues ensures a more equitable access for those who are at the bottom of the pyramid and greater vertical mobility.

e] MONETISING FREE / PUBLIC GOODS: Evolving fund raising mechanisms to enhance access for remote groups in inaccessible areas.

It is unlikely that resources can be harnessed by redeploying teachers and infrastructure.

Entirely new organizations shall have to be created to be run with younger persons with new Apps Development, Animation, Image Processing technology to adapt current lesson plans to a newer, more net-friendly version. How is the funding to be raised for this large need whose benefits shall accrues a generation later? Some method of a mixed use policy with free users (subsidized by state education departments) and paid users weaned away from the mind-numbing rote mechanics of the 'coaching classes' needs to be developed. The coaching industry closed 2015 with revenues of Rs 2.6 lakh crores. Certainly, an information and marketing plan can be launched to divert some 25% of this sum to a central body which shall popularize, oversee and spread MOOC based learning with blended and other net-based learning resources.

f] ENFORCEMENT OF POSITIVE HUMANISING GOALS: Ensuring that incorrect information, pedagogy, etc is not broadcast or misapplied.

The Indian Govt has taken on itself the role of being the unlimited provider to all the resource less, marginal groups in matters of health, nutrition, education and shelter. It not only has to provide the guidance, leadership, funds to the MOOC's movement but it also has to ensure its positive influence on all sections of society. It should not be allowed to degenerate into a tool for any particular political, religious cult, or ideological groups. It is a dangerous propaganda tool due to its graphic visual clarity, messianic voice exhortation, rapidity, reach, and repetitive nature. In an era when ISIS is able to recruit worldwide through online videos and online chat and convince youngsters to die for a 'cause'; one can scarce imagine how dangerous a MOOC's type platform can be, if it is left unregulated without any controls. Govt should oversee or supervise a NASSCOM type organization which would fund its development, ensure coordination, allocate resources and develop quality products. The space should not be left vacant for Zakir Naik's to emerge and usurp the vacant space in the minds of the untended and the unformed. The Govt / civil society should urgently develop resources to engage unformed minds of vulnerable citizens in tasks of nation building, character development, and skills acquisition. If unsupervised, hate ideology can be spread quickly on this platform via foreign origins.

g] AIMING FOR LARGER SOCIETAL GOALS: Enabling the MOOC's platform for social / financial / hygiene / health awareness programs.

This has to be an explicit goal for the MOOC's platform as it gives concrete objectives and assured budget for promotion and public participation for larger social goals for promoting which each ministry has a large budget. Recently, many ministries are commissioning very creative videos, on Swachh Bharat, Beti Bachao, Beti Padhao, Toilets within each rural home, etc. These funds can be allocated to a studio, animation, hardware, software platform which can develop its coordination and administrative capacity before venturing into mainstream education.

h] UNIVERSALISATION OF GRADING: Developing a credible, equitable and valid system of grading with transferable credits

To take complete advantage of the equity of the MOOC's platform (to assist the poorest sections in learning AND career objectives), a universally accepted system of validating and transferring academic (and other) credits is urgently required. This shall incentivize the learners without adequate financial and physical resources to take to using MOOC's for obtaining and upgrading credits over extended periods (while working) and assist them considerably in getting assignments on short contracts / jobs on permanent basis worldwide. This can be a strong motivating factor for learning via MOOC's. Just as we have coordinating bodies such as IEEE for hardware compatibility & Industry standards, Conferences, Publications and ICANN for Managing Internet

protocol numbers and Domain Name Systems, we urgently need a grading, certifying and central depository for maintaining grades / records which can assist employers to seek the exact motivated, specialized and attractively priced learners.

i] FORESEEING AND OBVIATING SOCIAL ILLS: Preventing Isolation & encouraging Social Interaction and Group learning as MOOC's is a lonely and self-paced methodology

There is a definite, visible and alarming downside to MOOC's and that is the retreat from socialization (interacting with social processes)and sociability, leading to isolation and belief and preference in 'virtuality' over 'reality' and relationships. This is noticeable in the large numbers of suicides over trivial reasons and deaths from taking 'selfies' in dangerous situations. We can cope with the current low numbers of 'loners' and unsocial types obsessed with screen-life (smartphone, tab, laptop) over real life but if there is an epidemic of self starters going the whole 'virtual' way of learning and entertainment and staying connected 24 x 7, then we have a really vast problem of dysfunctional adults prone to getting their own way and addicted to violence without any experience of intermediating reality thru social negotiation. Some strictures have to be placed on wholesale virtuality by enforcing reality in school, sports, physical activity and team endeavours.

j] BLENDED LEARNING : A practical approach to test the impact and evaluate the success rate. IIMB has initiated a movement to train teachers in Graduate classes how to use online resources along with real life classroom teaching and optimize 'blended learning'. This approach should be extended both across institutions in Universities of Law, Medicine, Science and also to primary schools and during international classes, conferences, etc.

k] INTERNATIONAL STANDARDS : The effect of extensive use of MOOC's in India would be to force Indian Curriculum to rise to International BEST standards or loose students to superior cost-benefit providers.

An interesting by-product of popularity and extensiveness of MOOC's availability in India shall be to familiarize remote Indian universities with detailed lesson plans of highest International standards in popular subjects at first hand on a regular basis. To compete with foreign and free providers, local providers (both teachers / mentors and content creators) shall be induced to enhance quality. The continuous and festering problem of outdated curriculum in a rapidly evolving world may be overcome.

My learning from four individual cases are enumerated below in short to illumine how I reached certain conclusions (contained within the points discussed above), based on which I have selected the above 11 points for detailed elaboration / discussion / evaluation and Recommendation.

1] A student raised in a highly educated family (grandfather a Ph D in Economics, father Ph D in Marketing, mother Ph D in education, all three from Ivy League Universities) is refusing to apply for any degree course at IIT, IISc, overseas. He has taught himself a great deal of aerospace design fundamentals from the net via MOOC's and is devoted to studying further 'on the net' and is seeking a research job at a futuristic hyperplane or moon-shot company. All this he wishes to achieve without any brand marker of a hallowed University. He is in touch with various start-ups in the domain and is confident of making it into these orgs. For this 'aware' learner, self-motivation and domain knowledge based on his central life interest is everything while external validation is nothing. This is the other extreme of the vast masses for whom external validation (via Kota coaching classes, the IIT-IIM brand, the AICTE diploma) is everything; and also opposite to the richest segment for whom the 'MBA from

foreign' tag is passport to enhanced respect and marriage prospects.

2] A business graduate (BBA) student of average quality from an educated family and a good school with normal (85%) ISC results started working in a hierarchical company at the very bottom. The continued exposure to young managers in several IIT IIM start-ups at a social level, inspired him to explore MOOC's courses in a serendipitous manner. After two expensive false starts, costing him some Rs 40,000 and getting certificates of 'nil' value, he stumbled upon the free and genuine certificates from Microsoft, Google, Facebook, etc and the highlight of his CV is now

A} a] Certified in Digital Marketing by Global University, b] GOOGLE Certified in Google Adwords c] GOOGLE certified in GOOGLE Anlaytics, d] Certified in Social Media Marketing by Vskills-Government of India e] HUBSPOT certified in Inbound Marketing, f] MICROSOFT Bing Ads certified by Microsoft.

On the basis of the above certifications, this learner is repeatedly getting new job offers but he is waiting to complete his (paid) Micro MBA in 6 Modules, from IIMBx on the edX learning platform. His salary is around Rs 10 lakhs pa plus ESOP's at age of 28.

3] A veteran Professor, IIT IIM and Ph D from Ivy League commenced his MOOC's journey right at the inception and completed two /three courses every semester since inception of edX and Coursera platforms. Foreign authorities tracking his regular / repeat excellent grades offered him a very lucrative assignment to regularly, monitor & evaluate the technical courses on their Platforms.

4] Of all my corporate learners (over one hundred with some ten years field experience and originating from diverse educational streams), I could inspire only one person to start a course on his specific domain (sound engineering), which would not be any help to him in his career. All these employees carry a laptop in their arms 24 x 7, but not one used it to register for a free MOOC's course!!!

In all my regular teaching classes, I inform repeatedly in detail about availability of all types of free online learning resources, starting from the Facebook, Google, Bing, Microsoft courses to FLIP, FPSB, from BSE, NSE, ICICI,, webinars from Digital Vidya, Physics, etc and I also email a detailed list of the business (finance & marketing) courses by the best US universities on EdX and Coursera platforms. I also encourage students to look at the dynamic websites of the 50 Museums in Delhi. This exhortation is repeated regularly but it has near zero effect on them.

In MOOC's the emphasis shifts entirely onto the LEARNER and away from the Teacher, which is given, verified, universal and uniform for all learners. The independent variables are with the learner, his intentions, physical & financial resources, stamina, capacity, relentlessness, focus, dedication, goal orientation, emotional strength (MOOC's is a lonely, long-distance marathon endeavour). It would seem that those who have the financial, physical and emotional resources are the only ones who are aware of educational and career material resources on the Internet AND seek personal fulfillment and life / career goals to utilize MOOC's to get still further ahead. Though, in theory, the technology is on an open platform without any restriction on access, in practice the MOOC's resources can be meaningfully utilized only by those who have personal / emotional strengths which can only come from love, security, confidence which comes from income and family stability over a few generations.

Financial : Resources are required for computer hardware / modem/ printer and fees for broadband net access, air conditioning, etc. This is rarely met in our Indian conditions.

Physical : Private space & time to learn with focus in a secure, protected, undisturbed environment. This is rather rare in our small, joint family housing. The TV is always on with some tear jerking sitcom blaring for the neighbour's benefit and with a stream of peddlers, vendors, couriers adding to the bell ringing pandemonium.

Emotional : Added to the above two- is emotional strength (lack of attention deficit)to retain focus and sustain attention continuously over extended periods, to search & evaluate competing providers, platforms, Universities, and Professors; to stay the course – vast emotional strength and maturity is required. It is most unlikely that financially insecure families with deficient space resources with precarious existence can have such strength over a long term.

WHAT **CONCLUSIONS** CAN I DRAW FROM THE RESULTS OF THE VAST RESPONDENTS SURVEY AND MY OWN EFFORTS TO POPULARISE MOOC's?

Truly MOOC's is a cornucopia, a Kamdhenu of unlimited, free access, self-paced, high quality, specialized universal tree of knowledge, free of location constraints for enquirers and beginners in all fields. Those employed can improve, knowledge, skills, careers, education and expect TANGIBLE benefits shortly. The Educators have to create a highly visible example of learning via distance / online resources from a very early age and familiarize / incentivize 'learners' to the vast & extraordinary benefits of all the world's best teachers within their laptop and use MOOC's as a complement to their daily classroom teaching. Of course, resources have to applied towards hardware and broadband and grades normalized and credits transferred to totally transform education and make it a levelling instrument across all ethnic groups, income levels, locations and linguistic barriers..

Chapter 11

Teaching and Research: A Necessary Union

R. K. Saxena

Abstract: Research and teaching are key pillars in higher education. It is time to provide reasons why research is given higher status, even though academics believe that, in principle, both aspects of the lecturer's role are equally valuable and mutually helpful. The relationships between teaching and research have been discussed and 'teaching' and 'research' are found to be somewhat inadequate concepts for distinguishing between different aspects of the educational arena. Presentation suggests that closer relationships between the two can provide the best impetus to fundamental for studies to improve the quality of higher education and teaching. It will help reinforce and fortify the ideas of students' clarity and doubts which may answer to his curiosity for satisfaction. It also, may provide significant impact to the teaching and research and understanding.

Research results provide fresh material for the classroom. Although some subjects we learn in the classroom are fairly well-established, many areas of computer science (and I would assume certain other fields, too) are rapidly evolving. With the rise of large content and service providers such as Google, Bing, Wikipedia and the proliferation of mobile devices; and the spread of connectivity to developing regions (to name a few developments), computer networking looks almost nothing like twenty years ago, and, while certain principles persist, the constraints of the domain and the applications of the technologies are continually evolving. Students strive for concrete examples and applications of concepts to the world that they know which is, incidentally, different from the world we knew when we were students. New research results represent prevailing theories, the outcome of our cumulative understanding, and the application of concepts to the most relevant problem domains or our time. I find that there is no better way to keep my course material current than to peruse the latest research and update the material so that it reflects current understanding.

Industry tracks research & Student should also do the same: It is well known that understanding continues to evolve as new research results emerge. In many areas, industry aggressively tracks new technologies and research results, and students aim will be more poised to make important contributions in industry if they are well-versed in current technologies. Students periodically thank me for covering a certain topic or concept in the classroom because "someone asked me about it in a job interview". Certainly, there is a balance between educating our students on the big picture and "timeless" concepts. Students are often quite grateful for having some exposure to the concepts and problems that industry is thinking about today. Instilling course material with fresh research results is one important way that instructors can help this process.

How Teaching Affects Research: It is well establish that emphasis on teaching methodology can make us better researchers. I sometimes find that certain faculty members are too eager to minimize teaching responsibilities in favour of "leaving more time to get research done". Now, it is worth acknowledging that the present day teaching in India sources many of the administrative aspects of teaching (e.g., grading, responding to student emails, organizational logistics) are incredibly time consuming and do not necessarily offer inherent benefits to research. However, brainstorming, innovative (intellectual) teaching helps better understanding own efforts to become a excellent researcher.

To create new knowledge, we must first master the existing body of knowledge. Research is

the process of creating new knowledge. Creating progress in knowledge requires a significant amount of background knowledge, before one can reach the "frontier" of a topic, where the interesting questions are. It is said by researcher that it takes about ten years of experience to get to the point of great accomplishment in any one area, simply because it takes a significant amount of time to accumulate knowledge in an area. This necessarily implies that we can't become great researchers in a subject area merely by taking a class (or even a few classes); we must embed ourselves in that topic area. It is well known that teaching a subject is perhaps one of the most efficient ways to become embedded in a subject matter, since the process of explaining concepts to students leaves no room for "cutting corners" in my own understanding. The process of building understanding in a particular area allows us to develop a deep understanding the paradigms and theories that currently exist, and how those paradigms and the existing knowledge base might be extended (or amended). Teaching Ph.D. students about a particular subject matter is also a way to bootstrap research, by helping our students get to the frontier of knowledge more quickly than they otherwise would; Teaching seminars on cutting-edge topics (above and beyond make teaching "requirements") simply because the process to be an efficient way of helping students quickly ramp up on a topic where I would like to see more research happening.

Example: Education & Teaching tremendously helpful in solidifying knowledge in this budding topic area. It is difficult to understand and takes time to deeply understand many of the latest developments. Teaching makes wonderful "forcing function" to familiarize myself with new technologies and ways of thinking,, It able to suggest better tools to students to use in their own research. Also, when we "stuck" to older technologies it quickly familiarized our self with latest technologies. By investing time to deeply understand how new techniques and technologies might be applied, It is able to make connections between problems solve the problems in the research lab and tools that could be useful for solving them. Second, it is able to make connections between concepts that had recently been developed to help solve some problems that we had been working on that hadn't yet been solved, example, concepts can provide composition of new techniques for new research & policies and provide techniques can be applied to understand some more technologies better and larger strategies, which provided a breakthrough on a problem which have lingering on for several years.

Teaching encourages us to think about the long road, the big picture, and what "really matters" about a particular research contribution: Teaching helps in explaining that why efforts sometimes fails in midway. A good explanation opens new possibilities for research. In other cases, research may offer solutions to a problem du jour, but sometimes research projects or papers are fairly self-contained, and it takes additional thought to really establish why (or whether) a particular result has broader implications that a student might care about. Student should take care about a particular research result, theory, or concept several years, in order brings down to the road, long, even left the education. It also helps for tackling broader problems after educational degree and classroom material provide better knowledge, even though not specialize in the particular field. It also forces researchers to understand and think about problem and idea why the problems which was he was working have broad impact and may provide better matter to society at large. Finally, teaching in class room of a particular result matters is perhaps one of the most useful exercises for distilling a research contribution to its essence.

Basic Directions:

1   Explanations an existing phenomenon, one can discover that existing explanations,

technologies, or theories don't actually suffice.

2. Teaching encourages us to think about the long road, the big picture, and what "really matters" about a particular research contribution.

3. Inspiration+Provocation encourages -> Students+Teachers and Encouragement Helps in development of Good & New Research

INFERENCE: Teachers / Teaching can influence and affect a large number of students tremendously in positive ways and research. Indeed, giving students the thirst for knowledge to the point that they want to not just consume existing knowledge but make discoveries themselves is a unique opportunity. Certainly, developing smart young students into the researchers of current and future generations is yet another way that our efforts in the classroom can pay long-term dividends for research.

References:

1. Nick Feamster and Alex Gray. The Relationship Between Teaching and Research: https://greatresearch.org/2013/11/01/the-relationship-between-teaching-and-research/

2. Angela Brew: Teaching and Research: New relationships and their implications for inquiry-based teaching and learning in higher education: Journal Higher Education Research & Development: Volume 22, 2003.

3. Brew, A. 1999a. Research and teaching: changing relationships in a changing context. Studies in Higher Education, 24(3): 291–301.

4. Elton, L. 1986. Research and teaching: symbiosis or conflict?. Higher Education, 15(3–4): 299–304.

5. Hattie, J. and Marsh, H. W. 1996. The relationship between research and teaching: a meta-analysis. Review of Educational Research, 66(4): 507–42.

6. Jenkins, A., Blackman, T., Lindsay, R. and Paton-Saltzberg, R. 1998. Teaching and research: student perspectives and policy implications. Studies in Higher Education, 23(2): 127–141.

7. Robertson, J. and Bond, D. 2001. Experiences of the relation between teaching and research: what do academics value?. Higher Education Research and Development, 20(1): 5–19.

8. Rowland, S. 1996. Relationships between teaching and research. Teaching in Higher Education, 1(1): 7–20.

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