

## Guest Editorial

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### Education for the Information Age

Speech and language are unique natural gifts of man. In contrast, writing, an invention of man, is one of mankind's greatest achievements. This happened perhaps, around 5000 years back. It enabled man to record his thoughts, experiences, ideas and achievements to inform and share. Though its potential for influencing the development and growth of civilized societies was very high, the invention of writing did not have the full impact it was capable of. The reason for this was that writing was a slow and

painstaking process, satisfactory materials on which to record writing were not available and there were no tools for making copies of the written material easily. Consequently written material was very scarce. Information and knowledge were not within the reach of common man; it was confined to an elite few.

A seemingly simple technological development, the circa 1452 invention of the moving type printing machine of Johannes Gutenberg, changed the course of human history. Scholars have felt that it was the single most influential event that nurtured European Renaissance.

There was ever-increasing activity in the production of books following Gutenberg's invention. Initially, they were religious books. Then followed all kinds of books to inform, educate and entertain the masses. Education opened its gates to all. It raised hopes and aspirations for the future. Education, earlier limited to miniscule groups, got liberated and democratized, and spread slowly to all sections of society. Schools, colleges, universities, and libraries were established. It was a revolution of great import. It was the Book that did it!

The renaissance was followed by the industrial revolution which started in late 18<sup>th</sup> - early 19<sup>th</sup> century in different parts of Europe. And this period was followed, in a sense inevitably, by the great advances in science and technology of the 20<sup>th</sup> century. There had never been such display of creativity, such levels of activity and achievement, such energy, in every conceivable area of human activity, at any time earlier in human history. A disconcerting feature of the changes was their ever-accelerating nature, challenging the ability of humans to adapt to them. All through these times education systems developed at various levels to meet the needs and aspirations of people.

And circa 1970 saw the beginnings of yet another revolution with far reaching effects. It was the computing and communication revolution. There is no area of science, technology, industry, commerce, management and governance not touched by it in deep and fundamental ways. Some scholars have referred to this development as having an effect on human societies akin to that of the earlier renaissance period and have referred to it as ushering in a second renaissance. The deep impact of these changes, globally, on the civilizational processes of human societies, is already visible.

We referred to the accelerating nature of developments in science and technology, and the very high levels of creativity driving these developments. A feature of these creative processes is the large-scale productive interactions among people working in disparate disciplines. Another feature is the rapidity with which obsolescence takes place. Products and technologies of today often do not last even half a decade; they are replaced by new developments. We are constantly challenged to cope with the whirlwind of changes.

Man's success has generated new problems. Issues such as pollution, environmental degradation, food and energy availability, sustainable development, proliferation of mass destruction capability, etc, have become big problems. Uncertainties of all kinds have become big concerns. And then there is the problem of information overload. Mankind will need all its energy, knowledge, ingenuity, sustained hard work, cooperative spirit and wisdom to find solutions.

The preeminent role of knowledge for success of future societies has been stressed by many scholars. Future societies will be knowledge societies, they say. In these societies, knowledge is the major production resource. Knowledge is created, shared and used for the well-being and prosperity of all. Future economies will be, to use a phrase popularized by the late Peter Drucker, knowledge economies. It is the knowledge content of and its use by societies that will decide their well-being and prosperity. Computing and communications driven information technology will be the major force behind knowledge economies.

The changes taking place are challenging education systems globally as never before. The current systems are felt to be inadequate, rather rigid and overly procedure oriented. They do not adapt to the changes taking place rapidly enough. There is need for radical changes.

Certain things are clear: the importance of imparting to students attitudes and skills to be life-long learners, of nurturing talent for innovation and creativity, of helping them to understand and appreciate developments not only in their own areas but also in disciplines other than their own, of developing in them the ability to ask the right kind of questions and the ability to find answers to them, and above all of helping them to develop into mature, sensitive and responsible social beings.

What are the shortcomings of our present education system? How can it be made to meet the challenges of Information Age? How will it handle the problem of scale and quality? The education community will have to find answers to these questions.

**Prof. S.S Prabhu**

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## From Chairman's Desk



### India's Pioneering and Path-Breaking Initiatives in Technology-Enhanced Learning

The XXI Century has seen many "shining" examples of India's achievements and accomplishments in a wide array of fields, which has caused the world to sit up and take notice : Space; Nuclear Power; IT, ITES , BPO; ...Cricket, Tennis, Olympics...and Education through IGNOU, ISRO, IITs, Prasar Bharathi, UGC, AICTE and the University System. Some of these are discussed here.

- **Satellite Based Education In India**

EDUSAT is the first Indian satellite built exclusively for serving the educational sector. It is mainly intended to meet the demand for an interactive satellite -based distance education system for the country. It strongly reflects India's commitment to use space technology for national development, especially for the development of the population in remote and rural locations.

A major initiative towards providing satellite based tele-education facilities to Engineering colleges in the country was launched on January 1, 2008 jointly by Indian Space Research Organisation (ISRO) in association with Indian Institute of Technology (IIT), Bombay. This EDUSAT network provides satellite-based tele-education facilities to students and teachers of the engineering colleges across the country. The teaching end is set up at IIT, Bombay by ISRO which will provide satellite bandwidth and install ground equipment at various recipient institutes across the country, while IIT, Bombay will arrange for delivering full -fledged courses on various engineering topics through its faculty on this network. In the EDUSAT Network, ISRO has set up more than 45 broadcast and interactive networks covering 20 states including North-Eastern states and Islands of the country. More than 30,000 classrooms have been provided connectivity through EDUSAT and the number is still growing steadily.

- **Eklavya Technology Channel**

Eklavya Technology Channel is a distance learning joint initiative between the IITs and IGNOU and was inaugurated on 26th January, 2003. "The objective of this initiative is to bring to the audience the actual IIT classrooms virtually at their door steps. It is a channel dedicated to technical education and runs programs generated at different IITs. The channel is designed to carry video courses in different disciplines generated at various IITs on weekdays and special interest programs on Sundays. Currently, eight complete courses are being run in parallel, contributed by IIT Delhi, IIT Kharagpur and IIT Madras, and are repeated in the same sequence without a break. It started as a 16 hours-a-day channel, but from 1st October 2003, it is now a 24 hours Channel.

- **The National Program On Technology-Enhanced Learning ( NPTEL)**

"The main objective of NPTEL program is to enhance the quality of engineering education in the country by developing curriculum based video and web courses. This is being carried out by seven IITs and IISc Bangalore as a collaborative project. In the first phase of the project, supplementary content for 129 web courses in engineering/science and humanities have been developed. Each course contains materials that can be covered in depth in 40 or more lecture hours. In addition, 110 courses have been developed in video format, with each course comprising of approximately 40 or more one-hour lectures. In the next phase other premier institutions are also likely to participate in content creation"

The National Programme on Technology Enhanced Learning (NPTEL), a project funded by the Ministry of Human Resource Development (MHRD) was first conceived in 1999 to pave the way for introducing multimedia and web technology to enhance learning of basic science and engineering concepts. Significant infrastructure has been set up earlier for production of video-based teaching material by the Indian Institutes of Technology (IIT) and Technical Teacher Training Institutes (TTTI). In the first phase of the NPTEL project (June 2003-June 2007), seven IITs and the Indian Institute of Science (IISc) have worked together to develop web and video based material for basic undergraduate science and engineering courses in order to enhance the reach and quality of technical education in the country.

The concept of multimedia based courses with high potential of interactivity has become a popular and a viable option for both the developed and the developing nations, though for different reasons. Offering multimedia courses in technology-assisted modes has not only become invaluable for the learner, but also an attractive and creative option for faculty. Such courses have the potential to enhance the on-and off-campus learning experience for students and in a distance learning mode. Technology opens up several interesting avenues for innovation in design and delivery of courses as also for sharing expertise among faculty in different parts of the world. In India, where a large number of private institutions have entered the field of engineering education with inadequate faculty support and training, the project is aimed at providing a standard for academic content for both the teacher and the student.

Many of the courses, especially basic core courses in science and engineering are similar across the IITs and to a lesser extent across many institutions in the country. Most institutions offer programme in traditional branches of engineering with a large number of similar courses forming a substantial part of the undergraduate curriculum. There is clearly a lot of advantage in sharing the development work in these courses. The NPTEL initiative in this regard is to help institutions all over the country to substantially increase the number and quality of the engineering graduates”.

(Excerpted from Prof. R. Natarajan’s IGNOU Convocation Address, Feb 28 , 2009 )

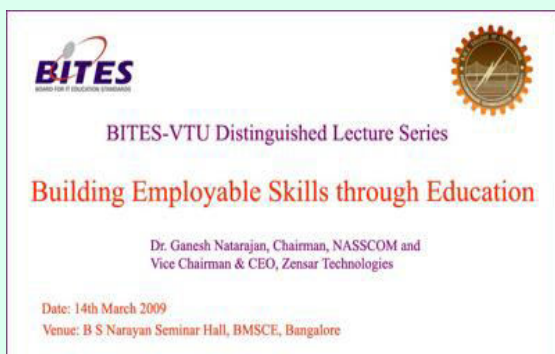
**Prof. R. Natarajan**

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## **BITES – VTU Distinguished Lecture Series – 3**

### **Building Employable Skills through Education**

**Venue:** BMS College of Engineering  
**Date:** 14<sup>th</sup> March, 2009  
**Sponsor:** BITES  
**Host:** BMS College of Engineering



Dr. Ganesh Natarajan, former chairman, NASSCOM and CEO, Zensar Technologies delivered the third BITES-VTU distinguished lecture on “**The IT industry today and an agenda for Employable Skills Development**”.

He traced the stupendous growth of the IT sector and the milestones it has reached in the last decade. IT sector is now providing direct employment for over 20 lakh people, contributed to USD 40.8 Billion in exports and accounts for 5.5% of GDP during 2008 with a turnover of USD 64 Billion.

IT industry is now providing end-to-end services encompassing custom application development, systems integration, H/W and S/W deployment and support, IT Education, training and consulting. It has now emerged as a truly global player with its presence in all the continents and is moving up the value chain to offer new and quality oriented services in high-tech, Telecom, Media and healthcare verticals.

However Dr. Ganesh Natarajan cautioned against complacency and outlined the challenges the IT Industry needs to address in the face of economic slowdown and global recession.

- Worldwide recession has caused unemployment all over the world.
- Employers will become extremely particular about relevant skills available in new recruits.
- Existing academic processes are delivering education but not employability for key vocational areas – particularly services

There is a need to strengthen the existing Technology-Entrepreneurship Eco-system comprising of Government, Companies, Industry Bodies, Educational & Research Institutions and Investors and quickly come-up with process innovations to address the challenges outlined above. In particular a new approach to educating young career aspirants in our country combining quality with scale has to be created.

He outlined the salient features of the German dual system of education in which industry and academia have forged a successful partnership and developed a new model of education that provides employability focus. It is a nationally coordinated program in which vocational schools that are specially setup offer industry relevant training for 1-2 days a week followed by in-firm training for 3-4 days a week. The dual vocational system offers significant benefits:

**For Enterprises:**

- Influence on content & Vocational Training Organization
- Lower recruitment costs at mid term
- Assured supply of “Next Generation Skilled Workers”

**For trainees:**

- Industry relevant training increasing employability
- Social Skills & Personality Development, Practical Training
- Motivating Earning & Learning Environment

**For the State:**

- Increase in Private Sector Contribution thereby lowering Public Budget
- Lowering rate of Unemployed Youth in the State

Over 350 training occupations are covered under this model; 430,000 vocational trainers and 200,000 companies are part of the program teaching over 800,000 trainees. German economy spends 28billion Euros annually on vocational training which has been a huge success.

The current training methods and institutions in India are inadequate to produce skilled manpower across geographies at a pace that the industry demands. This disparity is primarily due to the mismatch between the skills attained and those actually in demand.

Global Talent track (GTT) is an education initiative that has been setup in India by industry veterans to provide employable skills for retraining and creating fresh resources for services sectors along the lines of German model. It aims to make 500,000 students employable in next five years. The GTT career building program has three levels; Foundation, Intermediate and Advanced; each spans a year with 2-3 months of Industry internship. The program is flexible and provides a contiguous learning path to allow career progression all the way from entry level technician to a specialist IT consultant. The program also offers an executive MBA program of 11 months for working professionals.

GTT has a well defined roadmap for skill building which allows career shifts from other professions. It has an innovative assessment model with a mid-term assessment focusing on acquiring Knowledge and a final assessment focusing on applying the acquired knowledge to real life projects.

GTT has entered into a path breaking partnership with the University of Pune to train 30,000 students registered for BA, Bsc., Bcom, BBA, BCA, MCA and B Tech programmes across 100 colleges.