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INDUSTRY SPEAK

‘We need more IITs and IISCs’

Kris Gopalakrishnan, CEO and Managing Director, Infosys Technologies Limited, believes that we need to look at introducing revolutionary changes to education through technology

► We need to look at the pedagogy of education delivery. With technology allowing the recording of classes or simulated classes, we need to use these in our classrooms. This will allow us to leverage the classes delivered by the best teachers and communicators in all the classes, in rural and urban schools, in poor and rich schools. The role of the

teacher in the class changes to one of facilitator/managing learning. This has to be embedded in the new curriculum.

► Classes become a place where students learn to learn rather than where the transfer of knowledge takes place. Almost all information and knowledge are available on the Internet and these are getting updated every

minute. The role of the teacher is to help the student learn to learn.

► We need to invest more into research based educational institutions. We need more IITs and IISCs.

► Lastly, incremental changes will always take too long. We need to look at revolutionary changes to education. Just as

opening the economy in 1991, unshackled business and created a globally competitive industry in just 20 years and resulted in a GDP growth rate of 8% to 10%, we need to open the education sector to private and foreign participation, give more freedom to the existing institutions in managing the education process.

Hindustan Times ND 28/07/2011 P-8

HUMANITARIAN CAUSE

Magsaysay honour for 2 Indians

RECOGNITION An engineer and a social activist among the six from Asia



■ Harish Hande



■ Nileema Mishra

HT Correspondent

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NEW DELHI: Two Indians, Nileema Mishra, a social activist from Maharashtra and US-trained Indian engineer Harish Hande, were awarded Ramon Magsaysay award for the year 2011.

They are among the six persons in Asia, who were given the award. "The two had helped to harness technologies to empower their countrymen and created waves of progressive change across Asia," award foundation president Carmencita T Abella announced.

Mishra, 29, has worked for empowerment of women in Jalgaon district of Maharashtra and has formed self help groups of over 2,000 women in 15 villages to provide them livelihood

The two had helped to harness technologies to empower their countrymen.

CARMENCITA T ABELLA
award foundation president

avenues. Before her intervention most of them used to stay indoors and rarely ventured out.

These women now run small household units specializing in manufacturing of quilts, kurtas and pickles. They also run a micro finance institution helping the members at the time of financial crises.

Mishra's award citation said she was recognised for "her purpose-driven zeal to work tirelessly with villagers in Maharashtra.....to address both their aspirations and their adversi-

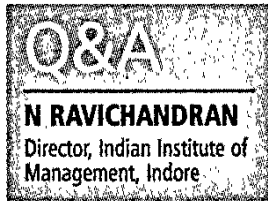
ties through collective action and heightened confidence."

Harish Hande founded the company SELCO-India with Neville Williams in 1995. A doctorate in energy engineering (solar specialty) from University of Massachusetts (Lowell) and a IIT Kharagpur passout, Hande revolutionised use of solar energy by developing equipment tailor-made for the needs of rural Indians.

The 44-year-old runs his own solar electric light company that has lit up over 1,20,000 households, to emerge as India's leading solar technology firm. "His passionate and pragmatic efforts to put solar power technology in the hands of the poor ... has encouraged the poor to become asset creators," the foundation said.

Business Standard ND 28-Jul-11 P10

We expect serious students to join the 5-year programme



Barely two months after the Indian Institute of Management, Indore, got autonomy, it announced a new five-year integrated programme in management (IPM). In spite of protests from other IIMs, institute Director N RAVICHANDRAN went ahead with his plans to introduce the programme after a Ministry of Human Resources and Development approval. Speaking to Vinay Umarji, Ravichandran talks about what made him venture into something no other IIM had tried so far. Edited excerpts:

How did you come up with the idea of a five-year integrated

programme?

The point is very simple: One way to look at any organisational activity is that there should be a product for every segment. In fact, for every price point there should be a product. I applied this principle to management education. We need to understand that markets will be segmented, and for every segment you need to come up with an appropriate product. For instance, there are people with work experience of over five years who now need a management education. So you come up with a post graduate programme for executives.

Your counterparts say it would dilute the IIM

brand. How did you convince the MHRD?

I didn't have to do anything. The MHRD's perspective is very clear. They respect the fact that IIMs are autonomous institutions. They genuinely believe that IIMs should be able to decide on their own as much as possible.

How do you propose to address faculty and infrastructure issues for the programme?

As of now, infrastructure is not an issue. However, faculty will remain a challenge. We will have to look for people from within and outside the country. The first two years will be demanding.

How have the students reacted to it?

It is difficult to gauge the responses since we are behind schedule. There is a lot of enthusiasm visible about the product. While it is not a very expensive programme, we expect only serious people to apply for it.

How do you plan to market the programme?

We will not get into an ad campaign. But marketing the product will not be hard. India is a huge country and we will find takers. We have been communicating with the target audience. For instance, we have made it clear that there was no exit option within the five-year programme and at the end of it, we will be providing a diploma and not a degree certificate.

Have you spoken to recruiters about the programme?

It is too early to speak to recruiters. This is a student-centric programme. While recruiters are an important part of our system, it is still sometime before they come into the picture.



Bringing a Sea Change in Fuel for the Future

How a Chennai startup is using macroalgae, commonly called seaweed, to drive India's biofuel thrust

HARI PULAKKAT
BANGALORE

The breakthrough idea came after two years of work. Sea6 Energy founders were convinced till then that microalgae held the secrets to a clean energy future. So did thousands of other entrepreneurs, researchers and investors around the world. Algae could produce many times more oil per unit area than any plant in the world. But two years into the project, and some serious calculations later, four students and their professor at IIT Madras were convinced that microalgae economics just wouldn't work for some time. Renewable energy isn't anyway economical at the moment without subsidies, but algal biofuels seemed hopelessly uneconomical. It was then that they thought of macroalgae.

Macroalgae is a technical term for seaweed. It seemed an extremely attractive proposition as an oil source even at first look. Seaweed grows in the shallow ocean waters and doesn't need land. Technology for its cultivation is well-established: it is being grown in the Tamil Nadu coast as a raw material for some cosmetics. Seaweed does not need external nutrients for growth: the sea is the ultimate nutrient reservoir. It grows quickly, is cheap and easy to harvest.

Microalgae on the other hand needed fresh water, large nutrient inputs and plenty of land. "We were preparing to abandon the project when we realised that we were chasing the wrong idea," says Sea6 Energy chairman Shrikumar Suryanarayan. Suryanarayan was for two decades the head of R&D at Biocon. He had left his job there in 2008 and was teaching at IIT Madras when some students sought his help to enter the



THE SEA6 TEAM (from left): Nelson Vadassery, Sayash Kumar, Saijaja Nori, Sowmyalakshmi Balendiran, KB Ramachandran and Shrikumar Suryanarayan at the IIT Madras' Jyothi and Bhubat Mehta School of Biosciences

We were preparing to abandon the project (microalgae) when we realised that we were chasing the wrong idea

SHRIKUMAR SURYANARAYAN
Chairman, Sea6 Energy

prestigious IEM competition at the Massachusetts Institute of Technology (MIT) in the US. They were denied a visa but still won a prize after making a video presentation.

Shrikumar then got them interested in biofuels. "We went to algal biofuel conferences and realised that we were at the same level as others," says Sayash Kumar, one of the students. Two years later, when they had finished their master's degree and were beginning to disperse, somebody thought of seaweed.

Only three other organisations then worked on macroalgal biofuel: Bio Architecture Labs based in San Francisco, the Korean Institute of Industrial Technology and the Philippines government. The microalgal biofuels landscape was littered with startups, but with no commercial breakthrough in sight, many of them were no longer able to raise money. Yet the sector has seen some of the biggest investments in renewable energy.

Silicon-Valley-based Synthetic Genomics got \$300 million from Exxon-Mobil, and San Diego-based Sapphire Energy has so far raised \$100 million. Pike Research has predicted the global biofuels market to reach \$247 billion by the year 2020. It was a good business in the long term.

Sea6 Energy was formed in July 2010. Shrikumar and a few IIT alumni chipped in with about Rs 1 crore to get the company going. Their first challenge was to tackle the seaweed cultivation itself. Pepsi had got together people in coastal Tamil Nadu to cultivate

Major Biofuel Startups

COMPANY	PRODUCT	INVESTMENTS	CURRENT STATUS
Synthetic Genomics	Algal biofuel	\$300 million from Exxon, other investments not disclosed	Developed some science, outdoor test facility to come up soon
Sapphire Energy	Algal biofuel	More than \$100 million	Has produced synthetic crude from algae, volumes and economics not disclosed
Solazyme	Oil from algae using plant feedstock	More than \$200 million, went public in May this year	Claims to have developed algae with more than 80% oil content
Coskata	Ethanol using heat, chemicals and biological processing	Not disclosed	Pilot plant for cellulosic ethanol to be ready soon
Amyris Biotechnologies	Petrol-like oil using genetically modified yeast, using plant feedstock like sugarcane	\$120 million	Producing renewable chemicals, building fuel plant in Brazil
LS9	Oil using genetically modified E. coli	\$75 million	Developing production plant in Brazil

seaweed for its food products. The price of seaweed is now Rs 20 a kg. To be viable as a biofuel input, its price has to come down to Rs 5 a kg.

Since the entire cost of cultivation was in labour, mechanisation was the only way to bring it down. Farmers cultivate seaweed on floating bamboo rafts in calm waters. Biofuel demands its cultivation on a very large scale, and in rough waters around most of the country's shores.

So the first job of Sea6 Energy was to create a strong framework to anchor the seaweed, which is heavier than water and sinks to the sea bottom. It was not a trivial problem but not impossible either.

The sea is a hostile environment but marine engineers had been working with several good materials. Sea6 realised that bamboo rafts break because they were rigid structures. A mesh structure that can move at the vertices would absorb the stress quite easily. The company developed an offshore

farming system, based on a marine plastics polymer, within six months of incorporation. It has also filed a provisional patent application. The founders are tackling the next steps, of finding a biological method to break down the plant into sugars and then converting the sugars into alcohol.

Unlike plants, seaweed contains no lignin and is easier to break down. Sea6 needs a microorganism that works in sea water. It has found a few. Converting the sugars into alcohol or other fuels is the easiest task. "Once you have sugars," says KB Ramachandran, professor of biotechnology at IIT Madras, who is incubating the company now, "we can make any petrochemical product."

Microalgae work a bit differently as they produce oil directly. When compared to plants and microalgae, the economics and technology are loaded heavily in favour of seaweed. Sugarcane has the highest productivity among plants, but you can get only 30 tonnes of it in a hectare. A similar area can

produce 100 tonnes of seaweed. Simple calculations will show that you need an area roughly the size of Punjab to produce all the oil that the country needs using seaweed.

"At the moment, from a technology point of view, seaweed is superior to microalgae," says Syed Yazdani, synthetic biologist and scientist at the International Centre for Genetic Engineering and Biotechnology (ICGEB) at Delhi. Sea6 Energy would need Rs 50-60 crore over the next four years to develop a farm of one sq km with a demonstration plant that produces ethanol and other petrochemical products.

By then the rest of the world would have also made substantial progress, judging from the increasing interest on seaweed. By then we should know whether large-scale seaweed cultivation brings up unforeseen environmental problems.

For feedback, write to us at et.technology@indiatimes.com

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OTHER SPHERE
ANURAG BEHAR

SOME TRUTHS ABOUT TEACHERS

In many a twilight have I sat with government schoolteachers, discussing education. Discussion over, they gather their bags and lunch boxes, having come straight from school, and head home. Some ride back on two-wheelers, some take the bus. Their homes are often 10-20km away, not an easy commute in rural and small-town India. Next morning they will open their schools, often another 10-20km from their homes, and get back to work: teaching with passion, managing with care and dealing with the vagaries of life, with determination.

These are teachers doing a good job, within every constraint that our government school system has. We have found these good teachers in every block (a typical district has three-six "blocks") that we have worked in, across 17 states. Many of them are not just good, they are exceptional.

In the same blocks, we have also dealt with teachers, who come drunk to school or don't come at all, and some entrepreneurial ones who "outsource" their teaching job to another person at 30% their salary and themselves run a business.

Between the drunk and the good teacher is the average teacher. She teaches, because that's her job. Accepting of her milieu, and of the difficult nature of her work, she neither demonstrates a spark, nor shirks what she thinks she has

We need a functioning system for the average teacher, because the fate of our education will always be determined by the average teacher

to do. The large majority of our teachers are the average teacher.

This is natural and not surprising. If you draw six million people from the population of India, for any purpose (in this case as teachers), you are bound to get the extremes of some good and some bad, but the large majority will be the average.

In this context let's get one issue out of the way: government schoolteachers are reasonably well paid—they are in the middle of the upper half of the income distribution of salaried people in their communities. The government teacher's job is the standard "good and secure" government job, and is in itself no reason to draw disproportionate number of competent or incompetent people from the population. Here I am not going to talk about para-teachers, which is a big issue in some states; nor about low

teacher salaries in large number of private schools.

Let's return to the issue of the good, average and bad (in reality this is a continuum—not neat categories) teacher.

The issue really is about how our system helps, manages and deals with the average teacher. At a very basic level this involves education of teachers—both before and after they become teachers. It involves academic and other kinds of support to teachers. It also involves managing and motivating teachers—both in the context of the school and the larger system. Let's look very briefly at these three aspects, on why our current system not just fails, but is a cause for the good becoming average, and the average becoming bad.

Our teacher education system is in a shambles. We have over 6,000 colleges running bachelor of education and diploma in education programmes. Informed estimates suggest that 80% of these colleges are near defunct. They have archaic curricula and inadequate faculty. In fact, a large number of these exist only on paper: they charge a fee, conduct an exam and award a degree—they are actually not functioning colleges. In addition, the design of the overall teacher education system is in itself disconnected from reality.

Once the teachers join the government system, they are supposed to go through 20 days of "in service" training every year, which happens, if at all, only in name.

Most states have a support system for teachers; they are the "cluster and block level resource" people and the District Institute of Education and Training. The people here are drawn from the same pool of teachers, with no help for them to deal with their new roles as academic experts. The ground-level reality is that they

are academic support people only in name; they are largely used for administrative purposes.

The less said about the management and motivation of teachers, the better. The hard reality is that the system treats them as lowest level functionaries of a bureaucratic system. As one of my friends who works with government teachers every day says "they are treated liked dirt, and they feel like dirt".

The fact is that we have designed a suboptimal system for teacher education, management and support. We are unable to make even that function, and then we blame the teachers. This is like blaming the soldiers for defeat in a war, to which they were sent untrained, logistically unsupported and deeply demotivated.

Improving the functioning of this system does not necessarily require more money, although that will help. It's largely a matter of will, of sensitivity and of concerted action. Progressive government officials recognize this, and some of them act. However, action in a few places is grossly inadequate; we need a nationwide upheaval in the teacher system.

We need a functioning system for the average teacher, because the fate of our education will always be determined by the average teacher.

Anurag Behar is CEO of Azim Premji Foundation and also leads sustainability initiatives for Wipro Ltd. He writes every fortnight on issues of ecology and education. Comments are welcome at othersphere@livemint.com



To read Anurag Behar's previous columns, go to www.livemint.com/othersphere





COLLEGES LEARN THE ART OF CHEATING

Quite a few educational institutions pay sixth pay panel scale to teachers only on paper

KALPANA PATHAK
Mumbai

Mitali Patel, an MBA degree holder and a lecturer for four years recently appeared for an interview at a Gujarat-based management institute. Though she was offered the job, Patel walked out of the interview.

Patel was told that she would be paid as per the Sixth Pay Commission recommendations, but that would only be on paper. In practice, she would receive salary according to the Fifth Pay Commission scale. "It's disgusting, to say the least," she says.

Narayani Chandran, however, is planning to do more than just staging a walk-out. She is exploring a legal option against her institute. After teaching management students for over eight years and deserving a pay scale of Rs 45,000 a month, Chandran is drawing only Rs 30,000 per month. "Our management makes us sign pa-

pers which say we are getting paid as per the Sixth Pay Commission. But in reality, we are receiving the Fifth Pay Commission pay scales. The money is pocketed by the institute's management," says Chandran.

It's not only business schools. If colleges of all shapes and sizes in the country are united in one thing, it's this: Downright cheating of their faculty members.

Many of these colleges are managed by charitable trusts and run group of institutions ranging from medical colleges, engineering colleges, polytechnics, hotel management & catering technology; MCA and MBA programmes in the country. But none of them adhere to the Sixth Pay Commission pay scales, say the faculty members.

A few of these colleges have also been awarded accreditation by the National Board of Accreditation (NBA), a body of All India Council for Technical Education, country's technical education regulator. The colleges also seek grant from AICTE under various schemes.

A few of them even flaunt accreditation from reputed companies on their institute's website.

Professor Javaid Akhter, Dean Faculty of Management at the Aligarh Muslim University gives some numbers. "Out of over 100 institutes, not more than five institutes pay full salaries," says Akhter who has been a part of accreditation process of universities by the National Assessment and Accreditation Council (NAAC), established by the University Grants Commission (UGC) to accredit universities and university colleges.

"I have noticed that as it is not mandatory to submit Form 16 of all employees, giving institutes a free hand," adds Akhter.

The recommendations of the Sixth Pay Commission were to be introduced with effect from the year 2006. The guidelines came in various stages up to the year 2008 and 2009.

"As the issue is a sensitive one, no one wants to speak on record. But our discussions with various teaching as well as non-teaching staff reveal that barring government-aided institutes, not more than 10 to 15 per cent institutions have actually implemented the Sixth Pay Commission recommendations. The remaining 15 per cent have implemented it partially," says Professor A K Sengupta, founder and convener of Higher Education Forum, a body of higher education professionals in India.

Professors of some institutes say one of the main reasons for not implementing the Sixth Pay Commission recommendations is that an overwhelming majority of trustees are interested in high return on investments and do not want to pay more to faculty members. The increase in salary is more than two times and the managements are not sure whether the students would pay for the same. Many institutes fear that if they raise the fee too often, seats will go vacant.

As per the sixth pay commission, a lecturer or assistant professor with two years teaching experience is eligible to draw Rs 30,000 per month against Rs 20,000 per month as mandated in the fifth pay commission. A Reader or an Associate Professor is entitled to Rs 45,000 per month, against Rs 30,000 per month as per the Fifth Pay Commission and a Professor should get Rs 80,000 and above, against Rs 65,000. For directors the salary is Rs 1,20,000 lakh, as there are administrative issues that they would have to deal with.

Academics says the regulators, including University Grants Commission, AICTE and Medical Council of India have been insisting on payment to the teachers in terms of the sixth pay commission, but none, despite knowing the anomalies, has turned a blind eye. An AICTE official when contacted, said he was not aware of any such thing.

Learning to become global citizens

Studying in an international setting does not only add to your resume, but also gives you exposure to diverse cultures

Rakesh Malik

One are the days when education was restrained by physical boundaries, today education has gained an altogether different meaning. 'Glocal' is the latest dimension that has been added to education. This is to say how the world has become a platform for the students and they are now travelling the globe to study. Be it the students moving out of India or students from other countries coming to India, their number is increasing. And in the present scenario, the students are gaining the most and are emerging as the ultimate winners—be it in terms of getting global exposure or enhanced understanding.

Says Ratika Verma, who did her Masters in Media and Communication from Goldsmiths College, University of London, "Studying here has been a life changing experience for me. It was here, that I got to know people from diverse cultural backgrounds. Apart from studies, this gave me an opportunity to experience learning more about myself and my Indian roots. From deeply owning my roots, defending them to sceptics, to glorifying to fans to representing essence of Indian-ness. It has been an exploration of many facets of my life that truly first shaped in India and then abroad. Through this exploration, I have come to strongly believe that, the more the roots grow deeper, the more the tree flourishes."

For Ina Bansal too it was a decision to get international exposure and enhanced understanding that made her travel to USA. She says, "My decision to pursue my master's degree at Columbia Law School (CLS) was guided not only by the fact that it is an Ivy League School but also by the fact that it is situated in one of the most vibrant cities in the world, New York. It is always a little scary to



It is an enlightening experience to listen to experiences of lawyers from 10 different jurisdictions. It makes one feel as if the world has seamless borders.
Ina Bansal

move to another country and I had my apprehensions but one look at the university dispelled all my fears. It lives up to its name and fame. The campus in itself with its numerous libraries and 200-year-old buildings laden with history is awe-inspiring. The residence provided to



It was a great opportunity to complete my higher education abroad. It took me around four years to complete my degree, but it was worth it.
Piyush Bhatia

in a software company in Orange County, California. I have seen some tough times here in this country, however, all tough times make an individual strong; so I overcame all my tough experiences and I can also say that I became a stronger person."

Those who want to study abroad, Piyush has a word of advice for them, "You will be taking some great responsibilities, such as getting a job for yourself, finding a place for yourself to live in, transportation costs, and you will be cooking. It will be a time to learn in life. Globalisation of education is a great opportunity for individuals to learn. This gives individuals a chance to enhance their quality of life, experience the difference, and similarities between both the countries. Attaining your higher education in a country with high academic record and good institutions is a good opportunity because it offers you a good living standard, promises job opportunities, and decent pay raises."

us in pre-war buildings gives us an actual taste of living in the Big Apple. It is indeed a wonderful feeling to not only be taught by some of the best professors, many of whom are known internationally but to be studying along with some of the best brains from the world around." She further adds, "It is indeed nothing short of an enlightening experience to be sitting in one class and listening to experiences of lawyers from 10 different jurisdictions. It makes one feel as if the world has seamless borders. The decision to quit my job and invest in a master's de-