

Newspaper Clips June 28-29, 2015

June 28

Hindustan Times ND 28/06/2015 P-1

HTSUNDAYSPECIAL

As IITs multiply, brand value falls

Vanita Srivastava

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NEW DELHI: What do you picture when you think of an IIT?

Probably not students shuffling from makeshift classrooms to borrowed labs, making do with lectures beamed live from other IITs because of a shortage of teachers.

This, though, is the situation at most of the 11 Indian Institutes of Technology opened since 2008.

That's the year that marks a sudden expansion drive that has seen the number of IITs go from seven in 1994 to a proposed 23 this year, with plans for an eventual 29 — one in each state.

As a fresh academic year begins at the IITs, with two institutes — Tirupati and Palakkad — taking in their first batches, what does this mean for a brand of premier institutes that was once a passport to success for students and a guarantee of quality for employers?

“Recruiters understand the difference between old IITs and the new ones,” says a senior professor at IIT-Delhi. “An IITian always stood for excellence, but now there is a distinction based on the location of the IIT. That distinction has slowly diminished the IIT brand.”

Some see hints of politicisation in the rush for new IITs. Educationists ask why use the

IIT tag on cobbled-together new institutes rather than expand existing ones or wait for the new ones to earn the tag.

It is a question of managing expansion in a pragmatic manner, says nuclear scientist Anil Kakodkar, who was also chairman of an empowered committee on IIT reforms. “I would say the movement has been in the right direction but at times the growth has been too fast.”

**INPUTS FROM
HIMANI CHANDNA**

TOO MUCH OF A GOOD THING

How many IITs are too many? And are the new ones, with their lack of infrastructure and faculty, diluting the brand? As a fresh academic year begins, a look at how the expansion could have been handled better

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Imagine if Oxford University suddenly tripled its number of colleges. Imagine then that some of these colleges had no campuses or hostels, and were operating out of borrowed labs and classrooms, with lecturers beamed live from older institutes because of a crippling shortage of faculty.

Now imagine you came across someone who said, with understandable pride, that she had studied at Oxford. Your first thought would no longer be, wow, Oxford.

It would be, which college? This is what is happening with the premier Indian Institutes of Technology.

A sudden expansion drive has seen the number of IITs go from seven in 1994 to a proposed 23 this year, with eventual plans for one in every state.

As a fresh academic year begins at the IITs, what does this mean for the brand of premier institutes?

"Expanding the number of IITs without ensuring adequate faculty and research infrastructure in the new institutions presents a significant risk to both the quality of the graduating students and the global brand of IITs," says Soumitra Dutta, an IIT-Delhi alumnus and dean of the Samuel Curtis Johnson Graduate School of Management at Cornell University, USA. Present-day students would agree.

IIT-Kharagpur student Divyvijay Patil, 20, launched a petition last year, pleading with union HRD minister Smriti Irani to stop launching new institutes.

"The intent should be to improve the existing IITs and expand with an eye on a culture of excellence," he says. "There is little about the new IITs that qualifies them for that tag. You cannot have an IIT where students have to travel to other colleges to use a lab."

Patil's petition received 9,487 signatures — most from fellow IITians — and was forwarded to Irani. It received no response.

Those associated with the new IITs are advising caution too.

"IITs should not be thought of merely as teaching shops, since that objective is fulfilled by thousands of engineering colleges across the country. Mass opening of IITs is not desirable," says former IIT-Ropar director MK Surappa.



The view from the basketball court to the building at the end of the pathway covers the entire campus of IIT-Gandhinagar.

Meanwhile, older IITs already struggling with teacher vacancies of up to 45 per cent are now also 'mentoring' the newer ones, in a formula that sees faculty shared between institutes, further straining the staff.

In a country where about 1 million students graduate each year, the need for more institutes of higher learning is undeniable. There are two elements that confound educationists: Why the rush for new IITs. And why use the IIT tag on cobbled-together new institutes rather than expand existing ones or wait for the new ones to earn the tag — as has been done in the past.

Some see hints of politicisation in the rush. "Every party wants to build its political image by setting up IITs. But at what cost?" says Anand Kumar, a mathematician and founder of the renowned Super 30 philanthropic IIT coaching institute. "Opening so many IITs has diluted the reputation of these institutes. What is the point of increasing the number of IITs when most do not offer the same quality?"

So where does one go from here? Most academicians agree that the key to the way forward is research — more research, better research, leading to more teachers (since the basic qualification for an IIT teaching position is a PhD), leading in turn to students who are more inspired to take up research, creating a virtuous cycle.

"A country of India's size, on a rapid economic growth path, requires a significant emphasis on large-scale engineering and technological research at the highest levels of excellence," says nuclear scientist Anil Kakodkar, who was also chairman of an empowered committee on IIT reforms. It is a question of managing this expansion in a pragmatic manner, Kakodkar adds.

"I would say that the movement has been in the right direction but at times the growth has been too fast. The way forward would be to enhance the PhD-level research at the IITs. Each faculty member should train four or five good research scholars and groom them as prospective faculty. That will determine the rate at which we can grow."

(With inputs from Abhishek Ranat and Apoorva Puranik)



EXPLORING THE PREMIER TAG



A lab at IIT-Indore. The campus is only partly operational.

THE STATE OF AFFAIRS

The IITs were first envisioned by the Sarkar Committee, which recommended in 1946 that world-class institutes be set up to meet the anticipated requirements of post-World War II industrial development.

The aim of these institutes would be to groom world-class engineering graduates to meet the needs of a developing India.

Most of the IITs set up since 2008 are still operating out of borrowed campuses, plagued by a lack of suitable labs and other physical infrastructure and a lack of hostels and recreational facilities, and depend heavily on lectures broadcast long-distance from other IITs, due to a lack of faculty.

Trupati and Palakad will take in their first batches of students this year, but will also function from temporary campuses. Directors have not been appointed for these institutes. Instead, they will both be mentored by IIT-Madras. Construction work has not yet begun on the space allotted for their campuses.

WHAT THE IITs HAVE MEANT

The IITs put India on the map globally, in terms of engineering and technological prowess.

Because of the quality of education implied in the IIT tag, graduates found warm welcomes in the biggest companies around the world and gained admission to the best foreign institutes of higher learning.

Many returned home with advanced degrees and global experience and played pivotal role in areas such as defence, the railways, science and technology.

WHY THE RUSH

With close to 1 million students graduating across India every year, the arguments of both the UPK and NDA governments has been that there is an urgent need for more institutes of higher education.

Some, however, see the rash of new IITs as a political ploy — as in Andhra Pradesh, where an IIT was promised as part of the bifurcation package.

"Initially, three IITs were planned in 2008; suddenly eight were announced. IITs should not be opened for political reasons, at short notice and without concrete planning as this will take a toll on their reputation," says CNR Rao, scientist and Bharat Ratna.

HOW THE BRAND HAS BEEN DILUTED

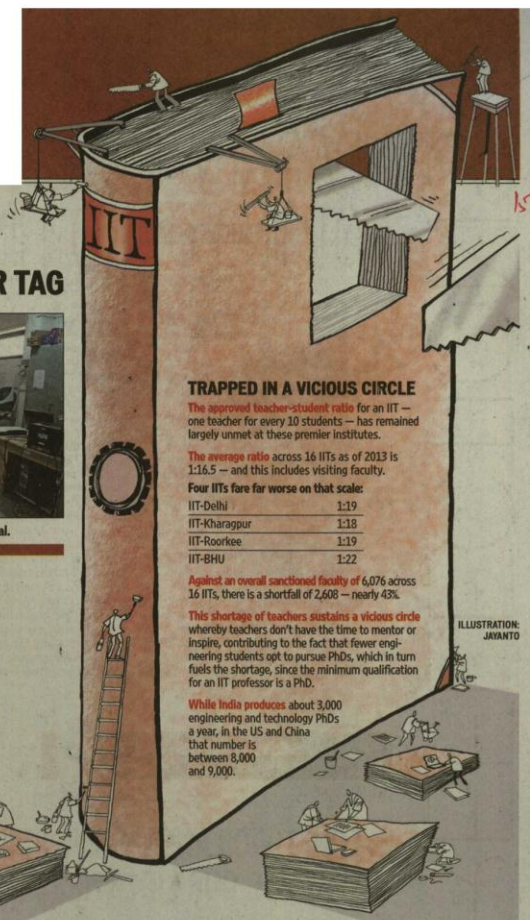
As a result of how students, parents and employers around the world viewed the IITs, the rush for the limited seats was immense.

As tens of thousands competed, coaching for the IIT entrance exams became a multi-core industry, giving rise to hubs such as Kota in Rajasthan.

A lot has changed since the rash of new IITs after 2008. Students are now passing up spots because they would rather attend an established IIT (National Institute of Technology) than a new IIT with no permanent campus, labs or faculty.

Over the past two years, about 200 seats have been going vacant each year, as outdated courses such as mining further push students towards other institutes.

"A time will come when people will not go by an overall IIT tag but will want to know which IIT an individual has attended," says former IIT-Delhi director RK Shevgaonkar.



TRAPPED IN A VICIOUS CIRCLE

The approved teacher-student ratio for an IIT — one teacher for every 10 students — has remained largely unmet at these premier institutes.

The average ratio across 16 IITs as of 2013 is 1:16.5 — and this includes visiting faculty.

Four IITs fare far worse on that scale:

IIT-Delhi	1:19
IIT-Kharagpur	1:18
IIT-Roorkee	1:19
IIT-BHU	1:22

Against an overall sanctioned faculty of 6,076 across 16 IITs, there is a shortfall of 2,608 — nearly 43%.

This shortage of teachers sustains a vicious circle whereby teachers don't have the time to mentor or inspire, contributing to the fact that fewer engineering students opt to pursue PhDs, which in turn fuels the shortage, since the minimum qualification for an IIT professor is a PhD.

While India produces about 3,000 engineering and technology PhDs a year, in the US and China that number is between 8,000 and 9,000.

ILLUSTRATION: JAVANTO

The first seven

- 1 Kharagpur (1951)
- 2 Bombay (1958)
- 3 Madras (1959)
- 4 Kanpur (1959)
- 5 Delhi (1961)
- 6 Roorkee varsity gets IIT status (1991)
- 7 Guwahati (1994)

In 2008

- 8 Bhubaneswar
- 9 Gandhinagar
- 10 Hyderabad
- 11 Patna
- 12 Jodhpur
- 13 Ropar

In 2009

- 14 Mandi
- 15 Indore

In 2012

- 16 Institute of Technology at Banaras Hindu University gets IIT status

In 2014

- 17 Goa
- 18 Chhattisgarh
- 19 Tirupati
- 20 Palakkad
- 21 Jammu

In 2015

- 22 Indian School of Mines at Dhanbad to get IIT status
- 23 Kamataka



(Above) The plot allotted to IIT-Palakkad. Construction is yet to begin. The first batch of students will be admitted this year and will operate out of a temporary campus. (Top) The library at IIT-Mandi. The campus is partly operational. HT PHOTOS: ARUN MOHIDE, BIPRAJ SHARMA, VIJAY B & GEETHA P

THE WAY FORWARD

Academicians agree that the three aspects holding back the IITs are funding, infrastructure and research.

The key lies in creating a strong R&D climate that would promote quality research, facilitated by state-of-the-art infrastructure, enabled by better funding.

More research would likely produce, and attract, more faculty. Nuclear scientist Anil Kakodkar, who was also chairman of an empowered committee on IIT reforms suggests that each faculty member train four or five good research scholars and groom them as prospective faculty. "That will determine the rate at which we can grow," he adds.

Course offerings need to be revised too, in keeping with global changes. Courses that are unpopular and have poor employability should be done away with. More virtual classes and online courses could be introduced, in collaboration with premier universities from around the world. More student and faculty exchange programmes and research partnerships should be instituted as well.

THE BIG STORY

GROUNDREPORT

NAMAN AGARWAL, 21, NIT GRADUATE

REFUSING A SEAT AT AN IIT



Agarwal's parents were adamant that he take any IIT seat he could get. "They were aghast when I chose NIT [National Institute of Technology] Rourkela instead," he says, laughing. "But I have never regretted my decision." When it became clear to Agarwal in the counselling rounds that the only IIT

he would get into was Patna, he decided to let the seat go. "It doesn't even rank among the top seven IITs," says Agarwal, who is now interning with a financial services company in Gurgaon. "The continuous pressure from family and the narrow mindsets of society have forced a lot of students to opt for new IITs, to their detriment."

The new IITs do not attract a lot of campus recruiters, adds Vipul Mehta, faculty and head of the foundation builder department at the Pace IIT and Medical coaching institute.

"A chunk of students in the rank zone of 5000 to 7000 are opting for BITS or an NIT rather than the newer IITs. I would recommend that students focus on getting the branch of their choice rather than settling for any course just for the IIT brand," Mehta adds.

ABHISHEK RAWAT

Hindustan Times ND 28/06/2015 P-15

JAYESH GUPTA, 24, IIT-MANDI GRADUATE

LONG COMMUTES TO LABS, LECTURES BEAMED LIVE



Gupta was part of the second batch of students at IIT-Mandi, having gained admission in 2010 to pursue a degree in mechanical engineering.

A resident of Raipur in Chhattisgarh, he graduated from the institute last year and is now preparing for the civil service exams. He wants to

join the foreign services.

“During my first two years at Mandi, we had to commute to regional colleges to access mechanical workshop facilities,” he says. “It was only in April this year that amenities such as the hostel, computing research labs, auditorium and canteen became fully functional at the permanent campus.”

Faculty was a concern too. About 10 per cent of Gupta’s classes were conducted by faculty at older IITs and beamed live.

Placements were also a concern. “At Mandi, students in core engineering branches had to struggle to find jobs,” he says.

Gupta is still glad that his degree carries the IIT tag. “More students deserve to get this tag,” he says.

OMKAR GOKHALE

Hindustan Times ND 28/06/2015 P-15

BRAND IIT

A look at some alumni who are now in the rarefied top echelons of global companies



SUNDAR PICHAI

Senior vice-president at Google, in charge of Android, Chrome and Google Apps

Studied at IIT-Kharagpur



VIC GUNDOTRA

Was vice-president of social networking at Google and helped create Google+

Studied at IIT-Madras



PADMASREE WARRIOR

Was Chief Technology and Strategy Officer at Cisco and CTO at Motorola, Inc

Studied at IIT-Delhi



VINOD KHOSLA

Was founding CEO of Sun Microsystems

Studied at IIT-Delhi



NITIN NOHRIA

Dean of Harvard Business School

Studied at IIT-Bombay

PHOTOS: GETTY IMAGES AND HT ARCHIVE

HIMANI CHANDNA

Only one chance for IIT, NIT aspirants to fill in choices

<http://timesofindia.indiatimes.com/City/Mumbai/Only-one-chance-for-IIT-NIT-aspirants-to-fill-in-choices/articleshow/47848679.cms>

MUMBAI: Engineering aspirants vying for seats in IITs and NITs will have to be very careful about filling in their choices this year. Since both the set of institutes will have a joint seat allocation process from Monday, students will get to fill their choices only once unlike before when students had the option to fill choices before every round. Students who fail to register on the online platform within the given window period will not be able to seek admissions in any of the participating institutes this year.

The Joint Seat Allocation Authority (JoSAA) is also facilitating a mock allocation round to give students an indication of what seats they can be allotted as per their choices. An official from an IIT said, "After the mock seat allocation, students will get a chance to revise their choices too. However, the mock process is just an indication of what students may get in the actual allocation rounds and may not be the same as the actual seat allocated. Once students revise their choices, the allocation will change too."

All candidates who have appeared for JEE (Main) are eligible to register for seat allocation (over 12 lakh) in NITs plus system (except IITs and ISM), and all candidates who were declared qualified in JEE (Advanced) are eligible to register for seat allocation (around 26,000) in all participating institutes. Students can have a look at the opening and closing ranks for each programme offered by IITs and NITs last year to get an idea of the admission pattern.

On a website prepared by undergraduate students from IIT-Bombay to help students organise their choices stated that it has to be noted that once some institute is allotted to them, they can float to others, or slide within the institute, so students have to make sure they have good choices. "Even if you think you have a one in a thousand chance of getting IIT-B Computer Science for example, fill it as your choice. If you do not fill it, you will never get it," warn the students. The site (<http://goo.gl/OQxBwU>) however is not affiliated to JoSAA or any IIT or NITs.

As per the revised schedule, the process will begin from Monday. However, since the system is taking into consideration multiple rank systems, the authority will have to wait for the announcement of JEE (Main) paper-I and II rank lists. "The CBSE was asked to announce the ranks before Monday. We are hoping to get it by Sunday night, or the admission process may be delayed further," said an IIT professor. The delay may have a cascading effect on the academic session of both IITs and NITs.

IIMs' toughest case

Avoid making them handmaidens of the HRD ministry

Business Standard Editorial Comment | New Delhi

June 27, 2015 Last Updated at 21:46 IST

http://www.business-standard.com/article/opinion/iims-toughest-case-115062700638_1.html

Even as she has bounced from one controversy to another in her 13 months as Human Resource Development (HRD) Minister, [Smriti Irani](#) has never shied away from a fight - with her favourite one-liner being that she is no political Cinderella waiting to be rescued. But the minister may have bitten off more than even she can chew in the latest controversy over the draft Indian Institutes of Management (IIM) Bill. And no one from her party or government has come forward to rescue her as yet; on the contrary, after keeping it hanging for more than 10 weeks, the [Union Cabinet](#) sent back the Bill forcing the ministry to put it up on mygov.in, the government's crowdsourcing website - a decision that [HRD ministry](#) officials themselves have termed intriguing. But the same officials are finding it difficult to explain why the Bill has sought to centralise decision-making at India's premier management institutes in the corridors of the HRD ministry.

What was more disconcerting was the way two new clauses were introduced unilaterally. If the HRD ministry and IIM representatives had agreed on a format of the Bill after elaborate discussions, introduction of two new clauses without the knowledge of the latter seems to be a clear breach of faith. In any case, consider the wording of some of the clauses: they talk about "regulations made by the board with the approval of the Central government," want a "coordination forum", whose role is to "deliberate on matters of common interest" (whatever that means) and to "perform such other functions as may be referred to it by the Central government." This is nothing but an attempt to make the [IIMs](#) handmaidens of the HRD ministry. If anybody has doubts over this interpretation, read on - the coordination forum will be chaired by the minister and have as members the minister of state of the Central government, four ministers of state governments, and the HRD secretary besides chairpersons and directors of IIMs and three others. The HRD ministry has perhaps forgotten that the larger IIMs are financially self-sufficient.

The government may argue that as the promoter of the IIMs, it has the right to take over power to approve recommendations on salary, fees and even scholarship programmes made by the boards of governors. But this argument defies the principle of operational autonomy that any government ought to give to these institutions. The larger point, however, is that the idea of introducing a law to allow the IIMs to offer degree courses is flawed. The question of a degree or diploma status of the IIM courses is overtaken by the market acceptance and valuation of IIM education and merely legislating on this to allow them to offer degree courses would only mean a nomenclature change and nothing more.

Ms Irani would do well to spend her considerable energy to other more substantive things like how to bolster skills education. She could also be better advised to create a proper and effective regulatory structure for the higher education sector. If that requires reforming AICTE, which governs technical education, or the UGC, which regulates higher education, so be it. That's a far more important job than trying to take over operational control of the IIMs. Addressing a seminar, Ms Irani had said she looks upon education as "an opportunity to redefine India's destiny". It's time she walked the talk and spared IIMs their toughest case study so far.

IISc alumni walk down memory lane

June 28, 2015, Bengaluru, DHNS

<http://www.deccanherald.com/content/486249/iisc-alumni-walk-down-memory.html>



Luminaries of the Indian Institute of Science (IISc) such as Prof Roddam Narasimha, former director of the National Aerospace Laboratories (NAL), and Dr Sudha Murty, Chairperson of Infosys Foundation, fondly remembered the days they spent at the institute, on the third day of the IISc Global Alumni Conference.

Prof Narasimha, was elated to speak about his association with IISc of more than 60 years. “I visited IISc for the first time in 1951, and saw an aircraft parked under a tree. I touched it, and found it beautifully curved. I immediately decided to study aeronautics,” he said, while explaining his fascination with aeroplanes. Using a lot of old photographs he recalled a number of people who made a big difference to his own life and aeronautics in India. Speaking of Prof Satish Dhawan, he said, “He was a remarkable person in many ways. He was different from others.” The session aptly titled “Reminiscence,” took the audience on a journey to the days when the institute was training some great minds of Indian science.

Recalling her student days at the IISc, Sudha Murty said: “Until I joined IISc, I hadn’t visited Bengaluru at all. In IISc, Prof V P Sen Gupta and his wife Nandini were very friendly, and gave me the warmth I needed.” In all, there were only fourteen women students in IISc at that time, she fondly remembered.

One of the oldest alumnus and former faculty of IISc, Prof S Ranganathan, who worked on metallurgy in IISc, recalled his undergraduate days in the Institute. “In those days, we got the undergraduate degree in two years, and at the end, we had to give a lecture,” he said.

He also proudly said the foundation stone to the building of Department of Metallurgy was laid by none other than Sir M Visvesvaraya. His first visit to IISc was in 1961, to attend the Gandhi Memorial Lecture delivered by Sir C V Raman.

Interview

“My Hope Is IITs Will Become Like MIT”

Prof C.N.R. Rao, a Bharat Ratna and recipient of over 60 honorary doctorates from across the world talks about the quality of our IITs.

[Bula Devi](#) Interviews [C.N.R. Rao](#)

<http://www.outlookindia.com/article/my-hope-is-iits-will-become-like-mit/294649>

Prof C.N.R. Rao, a Bharat Ratna and recipient of over 60 honorary doctorates from across the world, worked at the department of chemistry at IIT Kanpur during the early and middle parts of his distinguished career. He

is now Linus Pauling research professor and honorary president at the Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore. He took Outlook's questions on the quality of our IITs:

Are IITs today as good as they were?

Soon after the first IIT was started in Kharagpur, in 1951 or so, I was there as a research scholar. I was one of the first professors at IIT Kanpur when it was started in the early 1960s. The dream of IITs that we had in the early years was that they will become like MIT or CalTech. This has not happened. But the IITs have served the country by producing outstanding graduates. The problem is that there has not been proper balance between R&D and undergraduate teaching. Undergraduate education has been the main contribution of IITs and the contribution to R&D on average has not been as great. There are some exceptions, and a few IITs have done better than others in R&D. IITs have to try to become world leaders in science and technology.

Was it a mistake to set up more IITs?

When the eight new IITs were announced a few years ago, it was done in a rush. The plan then was to have three new IITs. Somehow, three became eight and many of them were started without enough planning. Some of them do not have a proper campus and adequate infrastructure. We hope they'll soon have satisfactory facilities.

What are the challenges before the IITs?

The proportion of postgraduate students in IITs is increasing. When it comes to PhDs and research, I would say that it is not a question of numbers; it is a question of what type of research we do. The IITs should contribute to the frontiers of science, engineering and technology. In this context, the contribution has been marginal, but some individuals have done well. On average, there is a need for improvement. I am sure that IITs are conscious of this and will improve.

What's the future?

My hope is that the IITs will eventually become like MIT or Caltech. When they become so, they will be in the very top 20-50 institutions of the world. I do not want to be pessimistic. There is a great challenge ahead and the government has to support the IITs better.

Running institutes hard: IISc ex-chief

<http://timesofindia.indiatimes.com/city/bengaluru/Running-institutes-hard-IISc-ex-chief/articleshow/47857916.cms>

BENGALURU: Former IISc director P Balaram on Sunday said every time an institute tries to excel, there are forces pulling it down - a reference to increasing political interference in the higher education sector.

He said: "Take IIT-Kharagpur, for example. It's not even a shadow of the institute I studied in. It's easy to establish institutes in India, but maintaining them is akin to playing snakes and ladders."

"We must understand the environment our institute, or any institution, is embedded in. Every time the debate about global ratings comes up, we must understand there are institutes abroad that receive a lot more support, public resource and funding. Running our institutions is very hard," he said.

He advised institutions to brace for more difficulties with funding for science in India decreasing. "Our economy is not doing as well as expected and funding will reduce further in the coming years. We'll have to

look at other sources of funding. Our alumni must do a lot in that regard," he said in a session on 'roadmap for IISc' on the last day of the IISc Global Conference.

"Every year when global ratings come out, we start thinking about how to improve in the next five years. One has to understand how the past century treated the institute, how it treated India and under what constraints we worked," he said.

He added that there have been constraints at every stage in every decade. "Institutions are products of what history has been and one has to understand how all this has affected the growth to be able to deal with the future," he said.

Supplementing him, Prof Usha Vijayaraghavan, IISc International Cell chairperson, made a presentation on what the institute has been doing to improve its standing and the challenges ahead.

"While we are doing a lot of collaborative work with some best universities abroad, the challenge is to attract more foreign students and faculty to do research here. We have a long way to go in that direction and efforts are on," she said. After all, the vision to be on the top is not something IISc began thinking about after the advent of global ratings, "it was the vision of its founder, JRD Tata", she said.

DUTA writes to Irani to withdraw CBCS

TNN | Jun 28, 2015, 01.58AM IST

<http://timesofindia.indiatimes.com/city/delhi/DUTA-writes-to-Irani-to-withdraw-CBCS/articleshow/47847956.cms>

NEW DELHI: The Delhi University Teachers' Association has written to the minister for human resource development to withdraw the proposed choice based credit system (CBCS) scheduled for implementation across universities from the academic session 2015-16.

DUTA said that introduction of the credit system at this stage will lead to illegalities and chaos as students seeking admission to the university were not informed of the changes.

In a letter addressed to HRD minister Smriti Irani, a copy of which was also marked to the chairman of the University Grants Commission and the DU vice-chancellor, it was stated that, "while the VC informed members of the executive council at its meeting held on May 28 that the CBCS would be implemented in the university from the academic session 2015-16, no mention of the credit system has been made to the students seeking admission to the university either in the information handout or in the online information bulletin or in any other form."

With the admission process entering its final stage and the second cutoff due to be issued on Monday, the letter highlighted the fact that the course structure and syllabi under CBCS have still not been brought before the academic council and the EC. According to section 7(4) of the Delhi University Act, "the courses and curricula shall be prescribed by the Ordinances and, subject thereto, by the regulations." This means that the only courses which exist as on date are the courses to which students were admitted in the last academic year (2014-15). Therefore, those seeking admission this year can only be admitted to the existing courses.

"We have repeatedly tried to draw the attention of the ministry and the UGC of the hurried manner in which the CBCS is being introduced," said Nandita Narain, president, DUTA.

June 29

Mail Today ND 29/06/2015

P-11

IIT-D WORKING ON APP TO TACKLE PROBLEM

AS THE civic agencies play the blame game, Indian Institute of Technology-Delhi is working on a project to solve the problem of flooding in the Capital for the Delhi government. The students are working on an app that can locate the stormwater drains in the city on the Graphic Information System (GIS) map. This is just one aspect of the app which is yet to get a name. The other aspect app is apprising the civic agencies on civic issues.

"A mathematical study is being carried out to identify how good the drains are in the city to handle the volume of water and eventually find out the possible solutions to tackle flooding in Delhi. The study is expected to complete by the end of the year," said Professor AK Gosain, Department of Civil Engineering, IIT-Delhi, who is leading the study.

Indian Express ND 29/06/2015 P-12

TAKEOVER BID

HRD ministry's draft bill, which seeks to strip IIMs of autonomy, frames the worsening crisis in higher education

YET ANOTHER CONTROVERSY is brewing with the Union human resource development ministry at its centre. The directors of the boards of the oldest and most prestigious IIMs in Ahmedabad, Calcutta, Bangalore and Lucknow have strongly opposed a draft bill that will grant "statutory status" to the 13 existing IIMs and label them "institutions of national importance" while also giving the Centre sweeping powers over their administration — basically stripping them of their autonomy. The chairman of IIM-L has warned of a "revolt" if the bill is passed in its current form, while the IIM-A director has accused the HRD ministry of seeking to reduce the IIMs to a "government department".

But this is an all-too-familiar row. The HRD ministry routinely — and deservedly — invites allegations of being overbearing, and of trying to cramp institutional autonomy. Earlier, it faced off with the IIT-Delhi director, who then resigned, citing "personal reasons", but the ministry's past record had raised suspicions of political interference. Later, it was embroiled in a public disagreement with Anil Kakodkar, chairman of the IIT-Bombay board, on the process of selection of the directors of three IITs — he accused the ministry of being "too casual" — and then, on whether or not he was still part of the process. In fact, HRD Minister Smriti Irani's tenure has lurched from one controversy to another, after the spat over Delhi University's four-year undergraduate programme (FYUP) erupted into an all-out brawl just as she took charge. The University Grants Commission's change of heart on the FYUP had carried the strong whiff of political pressure, considering that the BJP had promised a rollback in its Delhi manifesto. Emboldened by its victory, the UGC rushed into a scrap with the IITs, claiming jurisdiction over their degrees. Other missteps have included the cavalier removal of German from Kendriya Vidyalayas and the appointment of an individual as the chair of a national institute of technology in Nagpur for no apparent reason other than that he was a self-proclaimed "RSS person".

The HRD ministry's mission creep now threatens India's best-known institutions of higher education — spaces that have managed to carve out a global reputation precisely because they are, to a degree, insulated from the kind of micro-management that has doomed other universities. Of course, the disregard for institutional autonomy and academic freedom predates Irani's tenure and is a hallmark of the ministry regardless of the ruling dispensation. The terms of Arjun Singh, Kapil Sibal and Murli Manohar Joshi were similarly characterised by political and ideological meddling. Over the past year, hopes that Irani might inject new energy into a moribund ministry have dissipated. The crisis of the higher education sector is the same, if not worse.

Times Of India ND 29/06/2015

P-14

Don't Kill IIMs

Draft IIM Bill destroys autonomy and hits at the root of institutes' excellence

On the campaign trail in 2014, candidate Narendra Modi spoke proudly of how he went to IIM Ahmedabad for management lessons soon after taking over as Gujarat's chief minister. Creating an IIM and an IIT in every state was one of his key poll promises. Yet, a year after coming to power, his human resources development ministry is pressing for a new IIM Bill which, in its current form, will severely damage IIMs, turn them into handmaidens of sarkari babus and destroy the global brand name they have built so assiduously.

The stated purpose of the draft Indian Institute of Management Bill 2015, released for public consultation, is to strengthen IIMs, declare them institutes of national importance and allow them to grant MBA and PhD degrees – as opposed to the postgraduate diplomas and fellowships they currently offer. Yet, in the garb of upgrading, it

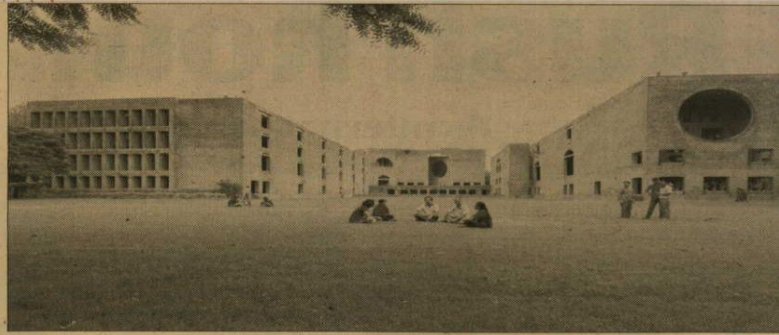


brings in such vast and sweeping powers of centralisation and government control that at least five major IIMs are publicly alarmed. A M Naik, chairperson of IIM Ahmedabad's board of governors, has expressed "deep reservations". J J Irani, chairperson of IIM-Lucknow's board says, "If the bill is passed in the current format, there will be a revolt in the IIM system." Kiran Mazumdar Shaw, chairperson of IIM-Bangalore's board has tweeted

the bill "compromises autonomy" and is "not in the spirit of government's 'minimum government, maximum governance' maxim".

There are two major concerns. First, the bill will reduce IIM boards to rubber stamps, given ominous phrases such as "regulations made by the board with the approval of the central government" and "the board may, with the approval of the central government, by notification, make regulations". Second, it empowers the central government to subsequently make rules for "all matters" such as appointment of the chairperson, terms and conditions for the director and administrative issues.

While PM Modi wants to make it easier to do business in India, his HRD minister is trying to make it harder to run India's best business schools. It is baffling why instead of sorting out the mess that is India's education system, the government is trying to fix the part of it that actually works. The Indian economy needs quality managers desperately. If this bill is passed it will not only hurt India's talented youth who aspire to high quality education within the country but also damage, perhaps irretrievably, the PM's own Make in India programme.



Whither IIMs?

We should let our prestigious management institutes be free from government control

D DIPTIVILASA



There has been considerable debate on the proposed restructuring of the Indian Institutes of Management (IIMs), which has been undertaken by the government, and comments have been sought on a draft Bill in this regard. Such restructuring has been in the works for the past over a decade, considering the number of committees that have examined IIM-related issues.

What's wrong with the IIMs? Various committees and government representatives have identified broadly the following concerns: that the number of MBAs need to be increased; that the degree should be called MBA rather than the Post Graduate Diploma in Management (PGDM) currently being given; and that the IIMs are a budgetary burden on the government exchequer. Most of the solutions presented in the Bill fall under the categories of oversight and governance, budgetary checks and levels of autonomy, besides the issues of renaming the degree.

Coming first to the governance and oversight issues, the critical changes proposed relate to making these IIMs statutory organisations rather than nuclear-society-run institutions. This would immediately bring them under the ambit of parliamentary debate and intervention. Elitist that these IIMs (at least the older ones) are, the people's representatives would like to have control on these and run them down like other universities. Perhaps the politicians would also like to interfere in faculty selection and getting students passed who, in the first place, would have got in through recommendations. The multi-layering of the oversight organisations would ensure that the director, whose performance would be reviewed each year, would have little time for achieving higher goals of eminence in thought leadership or enhancing the quality of the MBA or the Fellow Programme in Management (FPM). Students in PGDM, far from feeling let down by the name of the degree, revel in the exclusivity the nomenclature brings, which would otherwise have clubbed them with the products of roadside shops now dishing out MBAs. The constitution of the committees is a sure prognosis for higher level of government intervention, with the nominee members far outnumbering management professionals or institute representatives.

On the academic side, it claimed

that the FPM of the IIMs is not as good as the PhDs of the universities. The proliferation of universities, both public and private, has led to a slide in academic standards which cannot be believed. Many of these degrees can be faked or, better still, purchased in the right markets (which can be seen expressed in hushed tones). Even fake universities do exist, as can be seen by the UGC drives from time to time. Comparing the fellows from the IIMs to the PhDs of average universities can only be a travesty, which can best be avoided. The MBA and FPM degrees have developed a brand appeal and find listing in the respectable *Financial Times* and other rankings. It has been shown on the basis of percentage of rejections that getting into IIM Ahmedabad is more difficult than to get into the Ivy League colleges of the US.

Coming to the financial side, the desire to make the IIMs independent and not looking to government funding is, at best, ill-founded. Let us take IIM Ahmedabad as an example. The latest annual report on its website makes it clear that that income in the year 2012-13 was ₹164.4 crore, of which fees accounted for ₹85.33 crore and the government grant was zero

on this account. It has built up a corpus of ₹69.8 crore, with an investment of ₹437.73 crore. For the past several years, no grant, plan or non-plan has been availed by the institution. Yes, it appears that in the initial years the government funding was available for non-plan purposes, mostly salaries, and a phased

programme of refund can always be worked out if the government feels itself poor on this account. Compare this with the utilised funds in various other budgetary heads, as evidenced by the CAG's latest report: ₹5,732.94 crore understated in the USO fund in 2013-14 (over ₹33,000 crore over the past 10 years), ₹4,334 crore unutilised out of ₹4,876 crore in R&D cess over the past 17 years, ₹11,402 crore unutilised in the Prarambhik Shiksha Kosh over the past 10 years. Further, aggregate savings in certain departments exceeded ₹7 lakh crore, excess interest payments ran over ₹42,000 crore in six years, unspent balances of over ₹1 lakh crore in plan assistance to states, and suspense account in disbursements over ₹1,300 crore.

There have been many attempts in the past to bring to knees autonomous boards and authorities, and these have invariably led to whittling down the levels of excellence and bred only sycophancy. Will the IIMs be next in line, considering the view that the IIMs "cannot expect to become fully independent of the government?"

There have been many attempts in the past to bring to knees autonomous boards and authorities, and these have invariably led to whittling down the levels of excellence

The author is an MBA from IIM Ahmedabad

Mint ND 29/06/2015 P-1

LEGISLATIVE DEADLOCK

Govt likely to redraft IIM bill

Deadline for public comments may be extended; bill unlikely to be tabled in monsoon session of Parliament

BY PRASHANT K. NANDA
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NEW DELHI

The human resources development ministry is likely to redraft the controversial Indian Institute of Management (IIM) bill to incorporate changes suggested by some of the premier business schools after criticism that the proposed legislation was designed to erode their autonomy and vest sweeping authority with the government.

With the bill likely to go back to the drafting stage, it is unlikely to be tabled in the monsoon session of Parliament that begins on 21 July, two government officials said, requesting anonymity.

The ministry's retreat on the bill, which has been surrounded by controversy since being put in the public domain in the second week of June, signals a victory for the IIMs. The draft drew sharp criticism from the IIMs and industry, who claim the bill in its current form will turn the premier B-schools into mere "operating centres" with all major decisions being taken by the Union government.

"IIMs are doing just fine. If a bill is required at all, it needs to be redrafted," said Vamshidhar Guthikonda, an alumnus of IIM-Bangalore. The ministry needs to disclose why it needs to bring a bill to control IIMs, said Guthikonda.

The HRD ministry, headed by Smriti Irani, is likely to extend the deadline for seeking public comments on the bill, following requests from IIM-Ahmedabad and IIM-Lucknow. IIM-A chairman A.M. Naik has asked the ministry to extend the deadline to 31 July. The ministry had earlier sought public comments and feedback between 9 June and 24 June.

"If you look at the suggestions of some IIMs, especially IIM-A, then an extension is required. If the 31 July deadline is accepted, then it is very obvious that the bill cannot be tabled in the coming monsoon session," said the first government official.

In fact, it will take the ministry more time to go through the feedback that it has already received and incorporate some of them, the second official said.

"In a way, reworking the bill seems a must at this point of time. If we keep the controversies aside, still some suggestions need to be looked at with favour and this means reworking the bill," the official said.

IIMs have also complained that the draft that was discussed with them and the one that was put up for public comments were different. "If the bill is passed in the current format, then there will be a revolt in the IIM system," J.J. Irani, chairman of the board of governors of IIM-Lucknow, said in an interview on Thursday.

The first government official said that three sections—3(k), 35 and 36—will be given special attention as some IIMs have raised objections to them. These sections empower the Union government to set rules for IIMs.

While the first clause reads: "Regulations mean regulations made by the board with the approval of the central government", section 36 states: "The board may, with the approval of the central government, by notification, make regulations not inconsistent with this Act and the rules made there under to carry out the provisions of this Act."

The official said that IIM-A has asked to remove the phrase "with the approval of the central government" from section 3 and section 36 as they believe it will erode the autonomy of the institute. "The HRD ministry shall have a look at it. The HRD minister (Irani) was travelling and is back in Delhi now and the issue will be discussed at the minis-

Government likely to redraft IIM bill

FROM PAGE 1

ter's level."

The IIMs also want section 35 to be removed as it was not discussed with them. Section 35 empowers the Union government, among other things, to "make rules, for carrying out the provisions of this Act".

"In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely: (a) manner of appointment of chairperson under clause (a) of subsection 2 of section 11; (b) such other powers and duties of the board under clause (x) of subsection 2 of section 12; (c) the terms and conditions of service."

"Some of the IIMs feel that the bill should allow them the flexibility to fix compensation to its staff," the first official said. There has been a growing clamour for IIMs to get more flexibility to decide on the compensation of teaching and administrative staff if they so deserve. There is a clause in the draft bill which proposes that IIMs seek central government permission for such a move.

Naik, who is also group execu-

IIMs have also complained that the draft discussed with them and the one that was put up for public comments were different

tive chairman of **Larsen and Toubro Ltd**, said in his 24 June letter to the minister that the present bill needs a relook as it is favouring a "sweeping centralization of authority".

The second official said some 14 different clauses were questioned by the IIMs. IIM-A director Ashish Nanda and IIM-Bangalore director Sushil Vachani said they are hopeful of resolving the issues after discussions with the ministry.

The basic premises of the bill, including allowing degree-granting power to IIMs and facilitating excellence, will, however, remain unchanged, the government officials cited above said.

TURN TO PAGE 2

Tribune ND 29/06/2015 P-12

IIM-Paonta Sahib session from this year

AMBIKA SHARMA
TRIBUNE NEWS SERVICE

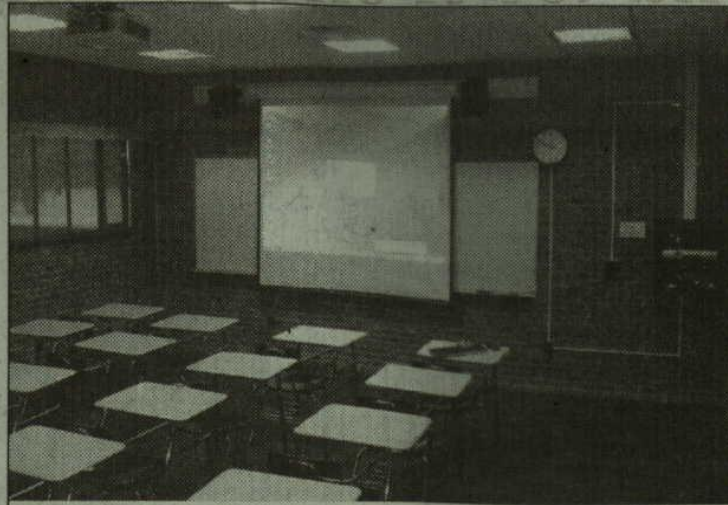
SOLAN, JUNE 28

The Central Government's nod to make six new Indian Institute of Managements (IIMs), including one at Paonta Sahib, operational in the current session has paved the way for initiation of its first academic session from the temporary campus.

Sources in the Department of Technical Education confirmed that these centres would initially offer postgraduate diploma courses in management.

A sum of Rs 79 crore has been set aside by the Ministry of Higher Education for putting in place requisite facilities on the temporary campus which would initially be registered under the Societies Act.

A decision to this effect had been taken at a meeting convened under the chairmanship of Secretary, Ministry of Higher



IIM-Lucknow is the mentor institute

- IIM Lucknow is the mentor institute for new campus
- A task force of IIM Lucknow has been entrusted the task of making this campus functional
- It will initially offer PG diploma courses in mgmt
- 4,400 sqm has been earmarked at Rampurghat in Paonta Sahib for the temporary campus

Education, at Delhi.

A task force comprising senior officials of IIM-Lucknow, which is the mentor institute for this new campus, has already been

entrusted the task of making this campus functional.

Sources in the Department of Technical Education revealed that the final campus would be set

up over 1.15 lakh sq km over a period of seven years by 2022-23. The new campus, once functional, would have a student strength of 1,145 with 125 non-faculty and 114 faculty members as per a communication received from the ministry.

An area of 4,400 sq m has been earmarked at Rampurghat in Paonta Sahib where the temporary campus which comprises 12 classrooms, five offices, three seminar halls, two conference rooms and space for library and computer labs is coming up.

This IIM was part of the budgetary announcement made by the outgoing UPA government in 2014 in its last budget.

The opening of this institute was a major achievement of the state government and it was trying to facilitate the ministry in all ways in opening this IIM.

HRD Minister Smt Smriti Irani Attends The 19th Conference of Commonwealth Education Ministers Aat Nassau, The Bahamas

<http://indiaeducationdiary.in/Shownews.asp?newsid=34998>

Report by India Education bureau, New Delhi: 19th Conference of the Commonwealth Education Ministers was held at Nassau, the Bahamas from June 22 to 26, 2015. The Conference which deliberated upon Quality Education for Equitable Development was attended by the education ministers of 38 Commonwealth countries. The Union Minister for Human Resources Development Smt. Smriti Irani led the Indian delegation which comprised Chairman UGC, Chairman NIOS and JS School Education and Literacy, MHRD.

The Conference was inaugurated by the Prime Minister of the Bahamas Mr. Perry Gladstone Christie. The plenary sessions were chaired by the Minister of Education, Science and Technology, the Bahamas Mr. Jerome K. Fitzgerald.

While responding to the issue paper on Quality Education for Equitable Development: Performance, Paths, Productivity the Union Minister Smt. Smriti Irani said that there could be no more opportune time than now that the Commonwealth countries work towards a more coordinated and holistic approach towards rationalizing methods and processes for inclusive and qualitative expansion of education in the respective countries. She underlined the significance of creating common platforms for deliberations on issues of mutual concerns so that issues like expansion, equity and excellence could be addressed in an integrated perspective. She also observed that a key measure of inclusive education would require significant increase in skill development initiatives to meet the emerging human resource requirements.

During her interventions the Union Minister observed that access to educational opportunities continues to bear the stamp of multiple dimensions of inequality that characterize our society: the challenges of world communities and having regard to that she called upon the Commonwealth countries to deliberate on this important subject. While reflecting on the issue of quality she said that the concern of quality in education would remain the centre stage of deliberations of each country of the Commonwealth as a key parameter for sustainable development and therefore there is a need to create a platform to share both the resources and the best practices.

The Union Human Resource Development Minister has made five major offers which were readily embraced by all the participating countries. She announced that India would set up The Malviya Commonwealth Chair for Cross Border Teacher Education which will focus on issues pertaining to curriculum development, pedagogy, student assessment, pre-service and in-service teacher training and capacity development. She also proposed to set up a Commonwealth Consortium for Research which can function in collaboration with the Commonwealth Education hub and provide cross funding for research projects which member nations deem appropriate. She also announced that India would provide its e-Learning platform SWAYAM to host e-courseware developed by Commonwealth of Learning. In addition she also proposed that India would post digitized materials of Commonwealth countries on its soon-to-be established national e-Library. Her contention about strengthening of public institutions to bring about qualitative improvements in education at all levels was greatly appreciated by the member countries. These specific announcements of the Union Minister became the part of Nassau Declaration which was unanimously adopted by the member countries.

India's active participation was greatly appreciated by the member countries as also by the Secretary General of the Commonwealth as well as by the Chief Executive Officer of the Commonwealth of Learning. The Commonwealth Secretary General Mr. Kamlesh Sharma commended India for its generosity in coming forward with innovative ideas and practical financial support for increased Commonwealth collaboration on teacher education and research. He said that "the establishment of the Malviya Commonwealth Chair and the Commonwealth Consortium of Research are immensely valuable. They were warmly welcomed by Ministers as demonstrating India's deep and continuing commitment to the Commonwealth of which it is a founding member."

As DU becomes distant dream, private varsities gain ground

ALTERNATIVES With emerging disciplines and more hi-tech, fancy facilities on offer students are turning to these universities despite high fees

HT Correspondent

htreporters@hindustantimes.com

NEW DELHI: For every seat in Delhi University, there are five candidates lined up. As seats in DU become more elusive every year, students now count on private universities that offer emerging disciplines with fancy facilities at much lower cutoffs. Many of these universities have seen a steady jump in the number of applications received every year and students are applying to them for admission as their first choice.

"Over last five years, there has been a 50% increase in the number of students applying to various programmes. We have already received 50,000 applications for undergraduate courses this year," said Sunita Singh, dean, admission and examination, Amity University, Noida. Amity has 9,000 seats in over 150 undergraduate courses admission to which is based either on class XII score or the university's own entrance test.

Singh added that the number and quality of central universities is limited and students have started exploring options in private universities without waiting for DU to turn them away. "We offer much better disciplines. There has been much hue and cry about the Credit-based Choice System in DU. We had started it last year and it is working quite well," Singh said.

Faculty from abroad, fancy and hi-tech classrooms, assured placements and feasible selection criteria ensure students do not miss the charm of a central university. But while all the other things are comparable, most of the private universities popping up in Noida, Gurgaon and further away have sky-high fees. Ashoka University, for instance, that was established in Kundli last year charges ₹4.9 lakh per year for an undergraduate course. A DU college charges not more than ₹50,000 annually.

"But we are extremely conscious that the education we

CHOICES GALORE

Many private universities have seen a steady jump in the number of applications received every year and students are applying to them for admission as their first choice.

AMITY (2003)

Location: Noida

Number of undergraduate courses: **140**

Total number of seats: **9,000**

Selection criteria: English language test followed by GD/Personal interview. Programme based written test/creative/physical test conducted wherever required

Admission process: On

Fee: **₹18,000 to ₹1.65 lakh** per semester

ASHOKA (2014)

Location: Kundli, Sonapat

Number of undergraduate courses: **15**

Total number of seats: Not specified

Selection criteria: Academic performance in classes IX to XII, extra-curricular activities, performance in interview

Admission process: On

Fee: **₹4.9 lakh** annually

GALGOTIAS (2011)

Location: Greater Noida

Number of undergraduate courses: **52**

Total number of seats: Not specified

provide in not restricted to those who can afford it. So we give scholarships. Of the 133 students in our founding batch, 88 are on some kind of scholarship. Twenty of them, in fact, get a full scholarship," said Vineet Gupta, co-founder, Ashoka University. The university has received 2,000 applications so far, of which about 300 students will be selected.

"Last year, our students had got through LSR and St Stephen's but they chose to join Ashoka," said Gupta. Uttara Chaudhuri, who



■ Most of the private universities popping up in Noida, Gurgaon and further away have sky-high fees. SAUMYA KHANDLWAL/HT FILE

Selection criteria: Class XII marks and entrance test score for technical courses

Admission process: On

Fee: **₹80,000 to ₹1.60 lakh** annually

SHIV NADAR (2011)

Location: Gautam Budh Nagar

Number of undergraduate courses: **14**

Total number of seats: **510**

Selection criteria: Class XII marks/JEE score, scholastic aptitude test and academic proficiency test,

application review

Admission process: On

Fee: **₹9.4 lakh** for eight semesters (scholarship available)

AMBEDKAR UNIVERSITY

(state university)

Location: Delhi

Number of undergraduate courses: **Seven**

Total number of seats: **245**

Selection criteria: Cut-offs

Admission process: Over

Fee: **₹33,600** annually

studied at Shri Ram School and chose to go to Ashoka, added, "I was very sure I did not want to go to DU. At 17, when you are right out of school, it's difficult to choose one course of study. Here, I had originally taken admission in literature and Computer Science. But I think I will do something along the lines of Political Science and Philosophy."

Galgotias University in Greater Noida, established in 2011, too has been getting many Delhi students in its professional courses. Half the number of stu-

dents come from Delhi NCR here.

"Students should not opt for an institution just by watching TV ads or full page advertisements in newspapers. They should check the placement records of the institution, the faculty profile and ask existing students and alumni about their experience. The students should also check for the required government recognitions before applying for any private university or college," said Kiran Verma, spokesperson, Galgotias University.

Will tweaked microbes make Mars Earth-like?

US Agency Aims To Alter Climate Of Red Planet

Washington: US defence scientists are planning to use genetically engineered algae, bacteria and plants to radically transform the climate of Mars and terraform it into an Earth-like planet.

Scientists from Defense Advanced Research Projects Agency (DARPA) aim to warm up and potentially thicken Mars' atmosphere by growing green, photosynthesising plants, bacteria, and algae on the barren surface of the red planet. "For the first time, we have the technological toolkit to transform not just hostile places here on Earth, but to go into space and stay," Alicia Jackson, deputy director of DARPA's new Biological Technologies Office said.

Since last year, Jackson's lab has been working on the process to genetically engineer organisms of all types, not just e-coli and yeast, which are mostly used in synthetic biology projects.

"Out of 30 million to 30 billion organisms on Earth, we use two right now for engineering biolo-



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DESIGN TO TERRAFORM

gy," she said. DARPA and some of its researchers have created a software called DTA GView, which Jackson calls the 'Google Maps of genomes', in which genomes of several organisms can be pulled up on the programme, which shows a list of known genes and where they are located in the genome.

"This torrent of genomic data we're now collecting is awesome, except they sit in databases, where they remain data, not knowledge. Very little genetic information we have is actionable," she said.

The goal is to pick and choose the best genes from whatever form of life we want and to edit them into

other forms of life to create something entirely new. This will probably first happen in bacteria and other microorganisms, but the goal is to do this with more complex, multicellular organisms in the future.

DARPA plans to use specifically engineered organisms to help repair environmental damage. Jackson said after a natural or man-made disaster, it would be possible to engineer new types of extremophile organisms capable of surviving in a scarred wasteland. As those organisms photosynthesised and thrived would naturally bring that environment back to health, she said. PTI



■ The OnSight technology creates holographic images allowing scientists on Earth to study Mars without having to travel to it. ISTOCK

Scientists to study Mars in virtual reality

Indo-Asian News Service

NASA and Microsoft have teamed up to develop a new technology that will enable researchers to work virtually on Mars using wearable technology.

Developed by NASA's Jet Propulsion Laboratory, the OnSight technology will give scientists the means to plan and, along with the Mars Curiosity rover, conduct experiments on the Red Planet.

"OnSight gives our rover scientists the ability to walk around and explore Mars right from their offices," said Dave Lavery, programme executive at NASA Headquarters in Washington.

OnSight will use real rover data and extend the Curiosity mission's existing planning

tools by creating a 3D simulation of the Martian environment where scientists – geologists, astronomers and astrophysicists around the world can meet.

Until now, rover operations required scientists to examine Mars imagery on a computer screen, and make inferences about what they are seeing.

But images, even 3D, lack a natural sense of depth that human vision employs to understand spatial relationships.

The OnSight system uses holographic computing to overlay visual information and rover data into the user's field of view.

Holographic computing blends a view of the physical world with computer-generated imagery to create a hybrid of real and virtual.