Newspaper Clips

December 27, 2010

Hindustan Times ND 27/12/2010 P-7

TRACKING NEW PATH

DTU students choose own ventures over lucrative offers

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THE UPSWING

- The job offers in DTU have gone up 30% this year, compared to the last year
- A total of 482 job offers have been made by 77 companies so far that includes 68 double or multiple job offers
- The highest pay package offered so far for this year is ₹10.49 LPA from Microsoft
- The average pay package so far is also slightly better than last year at over ₹6 LPA

NEW DELHI: He had a job offer of Rs10 lakhs per annum, but Anand Meena, now in the final year of B Tech opted out of the cushy corporate job to start his own venture with two of his classmates.

With the recession blues fading, the job offers in Delhi Technological University (DTU), have gone up 30 % this year, compared to last year.

What's more, with the markets looking up, more and more students like Meena are looking to start their own venture.

"I always wanted to do something on my own instead of working under some one and this was only possible by opening by own venture," said Meena who along with Anwesha Bose and Abhishek Bindal of the same batch have started Acube Solutions.

The venture deals with providing web solutions ranging from basic website designing and management, domain and web hosting to live webcasting of events.

Another final year student of Electronics & Communication Engineering, Ashish Mittal in collaboration with Ankit Aggarwal, alumni of DTU has started — Innovatiview — a venture that helps design and develop cost-effective solutions in the field of Robotics &Automation.

"So far, we have developed mobile jammers and our main clients are corporate offices and universities," said Mittal who too gave up the job offered to him.

"We encourage students to start their own ventures especially in the area of cutting-edge technologies like Robotics and Advanced Communication Technologies. There is a rise in techno-entrepreneurship spirit at the varsity because of which a good number of students this year have opted to set up their own techno-enterprise start-ups," said Vice-Chancellor PB Sharma.

The varsity has also seen a considerable increase in the number of jobs being offered this year.

A total of 482 job offers have been made by 77 companies so far, which includes 68 double or multiple job offers. Last year, 44 companies had visited DTU during the same time period and made 280 offers.

The prominent companies, which have visited DTU this year, include Microsoft, Maruti, IOCL, GAIL, Sony, Yahoo, C-Dot, Nestle, JP Morgan, L&T, Tata Motors, Google, TCS and NTPC, among many others.

The highest pay package offered so far for this year is ₹10.49 Lakh Per Annum (LPA) from Microsoft, which has made 4 job offers.

The average pay package so far is also slightly better than last year at over ₹6 LPA. With recession blues getting over, it is expected that the overall pay package will increase by 20% from last year.

"The focus on industry relevant education and innovations at DTU is being widely appreciated by the industry. The highly impressive placements this year speaks volumes about industry's faith in DTU," said Sharma.

Hindustan Times ND 27/12/2010 P-12

Isro sticks with GSLV

CHANDRAYAAN-2 Launch vehicle's Saturday failure no deterrent

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NEW DELHI: The Indian Space Research Organisation (Isro) plans to persist with the GSLV to propel the country's 2013 Chandrayaan-2 moon mission despite the launch vehicle's spectacular failure on Saturday – its fourth in seven attempts – space officials said on Sunday.

Isro chairman K Radhakrishnan said on Saturday that the Chandrayaan-2 mission project would be reviewed after the GSLV-F06 failed 47 seconds after take-off, fuelling suggestions that the space agency may be looking for alternate launch vehicles.

But officials of the space agency told HT on Sunday that Isro was continuing with its plan to use the GSLV as the launch vehicle for the 2013 moon mission. "We are not dumping the GSLV as the launch vehicle for Chandrayaan-2. We have three years to fine-tune the launch vehicle," a senior Isro scientist told *HT*.

Isro spokesperson S Satish also confirmed that the space agency was not mulling shifting to the tried and tested PSLV for Chandrayaan-2. "As of now, our plan is to use the GSLV," he said.

The choice of launch vehicle is critical for the 2013 moon mission because the PSLV – the Indian space programme's reliable workhorse – cannot carry the payload planned for the Chandrayaan-2 mission.

Chandrayaan-2 would have to significantly shed its currently proposed weight of 2,650 kg at lift off in order for the PSLV to serve as its launch vehicle. The GSLV is the sole Indian launch vehicle that can carry 2,650 kg.

The Chandrayaan-2 project – a tie up between Isro and the Russian Federal Space Agency – involves an orbiter and a rover, together carrying seven payloads. The payloads consist of scientific equipment meant to collect samples of rock and soil, conduct chemical analysis and transmit the data to the orbiter.

Reducing the weight of Chandrayaan-2 would mean offloading payloads and reducing the scientific potential of the project. The only option other than using the GSLV, without compromising on the payloads, would involve depending on a foreign launch vehicle like the European Ariane. But that would mean giving up a part of the pride associated with the project.

ON COURSE DESPITE DISASTER

■ An exploding GSLV-F06, on Saturday. PTI PHOTO

- Isro is continuing with its plan to use the GSLV as the launch vehicle for Chandrayaan-2, the 2013 moon mission
- The choice of launch vehicle is critical because the PSLV can't carry the payload planned for the Chandrayaan-2 mission
- Reducing the weight of Chandrayaan-2 would mean offloading payloads and reducing the scientific potential of the project

hindu ND 27.12.10 p-4

Focus on new avatar of Civil Services examination

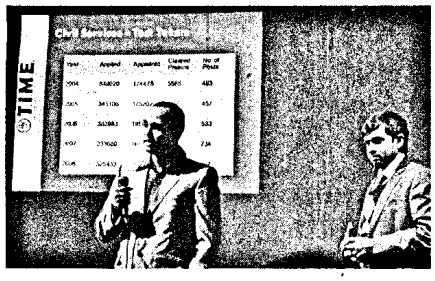
Staff Reporter

NEW DELHI: A number of queries related to the new avatar of the Civil Services examination conducted by the Union Public Service Commission were addressed at a seminar on "Civil Services Aptitude Test: Changes and Challenges" organised by *The Hindu* and Triumphant Institute of Management Education here in the Capital on Sunday.

T.I.M.E. faculty acquainted students with the changes in the Civil Services preliminary examination which consists of two papers. The well-attended seminar saw students voice their concerns about the CSAT and also pose questions on the manner of preparation. Many aspirants expressed the apprehension that the CSAT is along the lines of a management examination similar to the Common Aptitude Test.

Allaying their apprehensions, T.I.M.E. chief knowledge expert Dhrubajyoti Banik said: "The CSAT is extremely different from the CAT and while a few management students may write the examination, it is the serious Civil Services aspirants who will manage to crack the exam. The main weightage of marks lies in the general studies section. The changes have been introduced to test the candidate's aptitude and decision making skills."

In place of the optional paper in which students could exercise their choice and answer questions in a favoured subject, aspirants will now be quizzed on comprehension, interpersonal skills including communication skills, logical reasoning and analytical ability, decision making and problem solving, general mental ability, basic numeracy and English language comprehension skills of the Class X level. The first paper will test students on their knowledge of history, geography, current events, polity and governance, economic and social development, environmental ecology and general science.



ALLAYING APPREHENSIONS: *(From left) Gurgaon ACP Sumit Jangraj and T.I.M.E. chief knowledge expert Dhrubajyoti Banik during an interaction session with Civil Services aspirants in New Delhi on Sunday.* PHOTO: RAJEEV BHATT

Doubts were also raised regarding the English component of the examination. Students wondered if those who had studied in Hindi medium schools would stand a fair chance in the examination.

Gurgaon Assistant Police Commissioner Sumit Jangraj urged the students to be consistent in their preparations. "Six to eight hours per day should be enough if studying is done with consistency. It is also better to begin preparations for the Civil Services as soon as possible and follow reliable newspapers and magazines. Team work while studying can also help as students can enhance each other's learning outcomes."

Speaking about the challenges encountered as a civil servant, he said: "Trying to get everyone on board for decisions, dealing with politicians and the dynamic environment are some of the challenges we have to deal with."

The focus of the seminar was on easing the worries of the students with regard to the difficulty levels of questions in mathematics and English. They were also given a sense of various other sections in the preliminary examination. Sample questions were discussed with students and presentations and interactions were also done.

Seminar participants had the opportunity of appearing for a mock CSAT examination. Those who appeared have been invited for an analysis of the paper which will take place in the coming days. Similar seminars have been planned in Hyderabad and Kochi.

Indian Express, ND 27/12/2010 p-13

Christmas Special

The disposable academic

DOCTORAL DEGREES

Why doing a PhD is often a waste of time

ON THE evening before All Saints' Day in 1517, Martin Luther nailed 95 theses to the door of a church in Wittenberg. In those days a thesis was simply a position one wanted to argue. Luther, an Augustinian friar, asserted that Christians could not buy their way to heaven. Today a doctoral thesis is both an idea and an account of a period of original research. Writing one is the aim of the hundreds of thousands of students who embark on a doctorate of philosophy (PhD) every year.

In most countries a PhD is a basic requirement for a career in academia. It is an introduction to the world of independent research—a kind of intellectual masterpiece, created by an apprentice in close collaboration with a supervisor. The requirements to complete one vary enormously between countries, universities and even subjects. Some students will first have to spend two years working on a master's degree or diploma. Some will receive a stipend; others will pay their own way. Some PhDs involve only research, some require classes and examinations and some require the student to teach undergraduates. A thesis can be dozens of pages in mathematics, or many hundreds in history. As a result, newly minted PhDs can be as young as their early 20s or world-weary forty-somethings.

One thing many PhD students have in common is dissatisfaction. Some describe their work as "slave labour". Seven-day weeks, ten-hour days, low pay and uncertain prospects are widespread. You know you are a graduate student, goes one quip, when your office is better decorated than your home and you have a favourite flavour of instant noodle. "It isn't graduate school itself that is discouraging," says one student, who confesses to rather enjoying the hunt for free pizza. "What's discouraging is realising the end point has been yanked out of reach."

Whining PhD students are nothing new, but there seem to be genuine problems with the system that produces research doctorates (the practical "professional doctorates" in fields such as law, business and medicine have a more obvious value). There is an oversupply of PhDs. Although a doctorate is designed as training for a job in academia, the number of PhD positions is unrelated to the number of job openings. Meanwhile, business leaders complain about shortages of high-level skills, suggesting PhDs are not teaching the right things. The fiercest critics compare research doctorates to Ponzi or pyramid schemes.

Rich pickings

For most of history even a first degree at a university was the privilege of a rich few, and many academic staff did not hold doctorates. But as higher education expanded after the second world war, so did the expectation that lecturers would hold advanced degrees. American universities geared up first: by 1970 America was producing just under a third of the world's university students and half of its science and technology PhDs (at that time it had only 6 per cent of the global population). Since then America's annual output of PhDs has doubled, to 64,000.

Other countries are catching up. Between 1998 and 2006 the number of doctorates handed out in all OECD countries grew by 40 per cent, compared with 22 per cent for America. PhD production sped up most dramatically in Mexico, Portugal, Italy and Slovakia. Even Japan, where the number of young people is shrinking, churned out about 46 per cent more PhDs. Part of that growth reflects the expansion of university education outside America. Richard Freeman, a labour economist at Harvard University, says that by 2006 America was enrolling just 12 per cent of the world's students.

But universities have discovered that PhD students are cheap, highly motivated and disposable labour. With more PhD students they can do more research, and in some countries more teaching, with less money. A graduate assistant at Yale might earn $20,000 a year for nine months of teaching. The average pay of full professors in America was $109,000 in 2009—higher than the average for judges and magistrates.

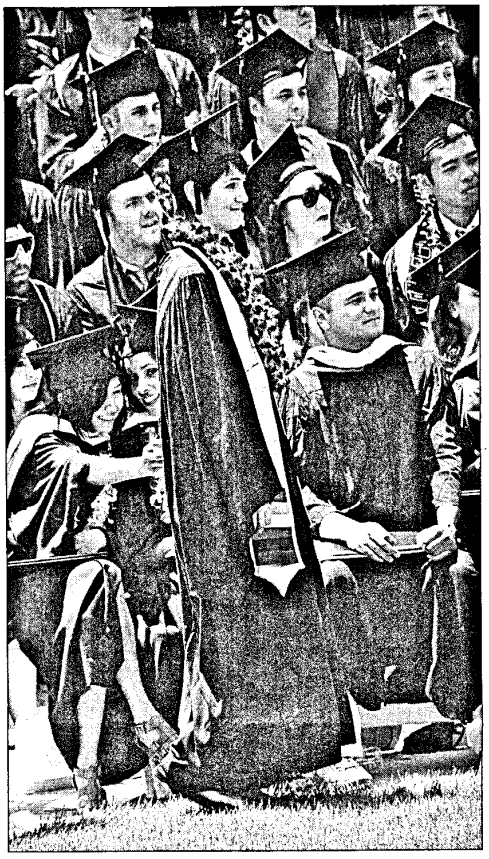
Indeed, the production of PhDs has far outstripped demand for university lecturers. In a recent book, Andrew Hacker and Claudia Dreifus, an academic and a journalist, report that America produced more than 100,000 doctoral degrees between 2005 and 2009. In the same period there were just 16,000 new professorships. Using PhD students to do much of the undergraduate teaching cuts the number of full-time jobs. Even in Canada, where the output of PhD graduates has grown relatively modestly, universities conferred 4,800 doctorate degrees in 2007 but hired just 2,616 new full-time professors. Only a few fast-developing countries, such as Brazil and China, now seem short of PhDs.

A short course in supply and demand

In research the story is similar. PhD students and contract staff known as "postdocs", described by one student as "the ugly underbelly of academia", do much of the research these days. There is a glut of postdocs too. Dr Freeman concluded from pre-2000 data that if American faculty jobs in the life sciences were increasing at 5 per cent a year, just 20 per cent of students would land one. In Canada 80 per cent of postdocs earn $38,600 or less per year before tax—the average salary of a construction worker. The rise of the postdoc has created another obstacle on the way to an academic post. In some areas five years as a postdoc is now a prerequisite for landing a secure full-time job.

These armies of low-paid PhD researchers and postdocs boost universities', and therefore countries', research capacity. Yet that is not always a good thing. Brilliant, well-trained minds can go to waste when fashions change. The post-Sputnik era drove the rapid growth in PhD physicists that came to an abrupt halt as the Vietnam war drained the science budget. Brian Schwartz, a professor of physics at the City University of New York, says that in the 1970s as many as 5,000 physicists had to find jobs in other areas.

FLICKR/JASON BACHE



In America the rise of PhD teachers' unions reflects the breakdown of an implicit contract between universities and PhD students: crummy pay now for a good academic job later. Student teachers in public universities such as the University of Wisconsin-Madison formed unions as early as the 1960s, but the pace of unionisation has increased recently. Unions are now spreading to private universities; though Yale and Cornell, where university administrators and some faculty argue that PhD students who teach are not workers but apprentices, have resisted union drives. In 2002 New York University was the first private university to recognise a PhD teachers' union, but stopped negotiating with it three years later.

In some countries, such as Britain and America, poor pay and job prospects are reflected in the number of foreign-born PhD students. Dr Freeman estimates that in 1966 only 23 per cent of science and engineering PhDs in America were awarded to students born outside the country. By 2006 that proportion had increased to 48 per cent. Foreign students tend to tolerate poorer working conditions, and the supply of cheap, brilliant, foreign labour also keeps wages down.

Proponents of the PhD argue that it is worthwhile even if it does not lead to permanent academic employment. Not every student embarks on a PhD wanting a university career and many move successfully into private-sector jobs in, for instance, industrial research. That is true; but drop-out rates suggest that many students become dispirited. In America only 57 per cent of doctoral students will have a PhD ten years after their first date of enrolment. In the humanities, where most students pay for their own PhDs, the figure is 49 per cent. Worse still, whereas in other subject areas students tend to jump ship in the early years, in the humanities they cling like limpets before eventually falling off. And these students started out as the academic cream of the nation. Research at one American university found that those who finish are no cleverer than those who do not. Poor supervision, bad job prospects or lack of money cause them to run out of steam.

Even graduates who find work outside universities may not fare all that well. PhD courses are so specialised that university careers offices struggle to assist graduates looking for jobs, and supervisors tend to have little interest in students who are leaving academia. One OECD study shows that five years after receiving their degrees, more than 60 per cent of PhDs in Slovakia and more than 45 per cent in Belgium, the Czech Republic, Germany and Spain were still on temporary contracts. Many were postdocs. About one-third of Austria's PhD graduates take jobs unrelated to their degrees. In Germany 13 per cent of all PhD graduates end up in lowly occupations. In the Netherlands the proportion is 21 per cent.

A very slim premium

PhD graduates do at least earn more than those with a bachelor's degree. A study in the Journal of Higher Education Policy and Management by Bernard Casey shows that British men with a bachelor's degree earn 14 per cent more than those who could have gone to university but chose not to. The earnings premium for a PhD is 26 per cent. But the premium for a master's degree, which can be accomplished in as little as one year, is almost as high, at 23 per cent. In some subjects the premium for a PhD vanishes entirely. PhDs in maths and computing, social sciences and languages earn no more than those with master's degrees. The premium for a PhD is actually smaller than for a master's degree in engineering and technology, architecture and education. Only in medicine, other sciences, and business and financial studies is it high enough to be worthwhile. Over all subjects, a PhD commands only a 3 per cent premium over a master's degree.

Dr Schwartz, the New York physicist, says the skills learned in the course of a PhD can be readily acquired through much shorter courses. Thirty years ago, he says, Wall Street firms realised that some physicists could work out differential equations and recruited them to become "quants", analysts and traders. Today several short courses offer the advanced maths useful for finance. "A PhD physicist with one course on differential equations is not competitive," says Dr Schwartz.

Many students say they are pursuing their subject out of love, and that education is an end in itself. Some give little thought to where the qualification might lead. In one study of British PhD graduates, about a third admitted that they were doing their doctorate partly to go on being a student, or put off job hunting. Nearly half of engineering students admitted to this. Scientists can easily get stipends, and therefore drift into doing a PhD. But there are penalties, as well as benefits, to staying at university. Workers with "surplus schooling"—more education than a job requires—are likely to be less satisfied, less productive and more likely to say they are going to leave their jobs.

Academics tend to regard asking whether a PhD is worthwhile as analogous to wondering whether there is too much art or culture in the world. They believe that knowledge spills from universities into society, making it more productive and healthier. That may well be true; but doing a PhD may still be a bad choice for an individual.

The interests of academics and universities on the one hand and PhD students on the other are not well aligned. The more bright students stay at universities, the better it is for academics. Postgraduate students bring in grants and beef up their supervisors' publication records. Academics pick bright undergraduate students and groom them as potential graduate students. It isn't in their interests to turn the smart kids away, at least at the beginning. One female student spoke of being told of glowing opportunities at the outset, but after seven years of hard slog she was fobbed off with a joke about finding a rich husband.

Monica Harris, a professor of psychology at the University of Kentucky, is a rare exception. She believes that too many PhDs are being produced, and has stopped admitting them. But such unilateral academic birth control is rare. One Ivy-League president, asked recently about PhD oversupply, said that if the top universities cut back others will step in to offer them instead.

Noble pursuits

Many of the drawbacks of doing a PhD are well known. Your correspondent was aware of them over a decade ago while she slogged through a largely pointless PhD in theoretical ecology. As Europeans try to harmonise higher education, some institutions are pushing the more structured learning that comes with an American PhD.

The organisations that pay for research have realised that many PhDs find it tough to transfer their skills into the job market. Writing lab reports, giving academic presentations and conducting six-month literature reviews can be surprisingly unhelpful in a world where technical knowledge has to be assimilated quickly and presented simply to a wide audience. Some universities are now offering their PhD students training in soft skills such as communication and teamwork that may be useful in the labour market. In Britain a four-year NewRoute PhD claims to develop just such skills in graduates.

Measurements and incentives might be changed, too. Some university departments and academics regard numbers of PhD graduates as an indicator of success and compete to produce more. For the students, a measure of how quickly those students get a permanent job, and what they earn, would be more useful. Where penalties are levied on academics who allow PhDs to overrun, the number of students who complete rises abruptly, suggesting that students were previously allowed to fester.

Many of those who embark on a PhD are the smartest in their class and will have been the best at everything they have done. They will have amassed awards and prizes. As this year's new crop of graduate students bounce into their research, few will be willing to accept that the system they are entering could be designed for the benefit of others, that even hard work and brilliance may well not be enough to succeed, and that they would be better off doing something else. They might use their research skills to look harder at the lot of the disposable academic. Someone should write a thesis about that.

Hindu ND 27.12.10 p-8

Let a thousand heretics bloom

Brinda Bose and Prasanta Chakravarty

Liberal education is a sustained and controlled matter, where practicality is directly related to searching analyses and the fecundity of thought processes. Sadly, the flag-bearers of a new India have no clue about such a pedigree of liberalism.

You can construct a cutting-edge archaeological demolition of the latest Ramjanmabhumi controversy in a radical leftist blog. You can be an acknowledged scholar in Renaissance Humanism and orate in the classroom on the complexities of non-articulated communication. But since Prudence is the new name of the game in racing to (re)build India Shining, you can wear at least two hats. You can, when the suavely smiling Human Resource Development Minister lays out his blueprint for New India — toward which you are lured by the possibility of a role in its fashioning — graciously convince yourself and others that maturity means taking cognisance of an age that "demands an image of its accelerated grimace." And so you can pull caution and far-sight out of your front pocket, while you keep your conscience appeased by nursing your intellectual and political predilections in your hip one. You, we fear, are the dangerous face of the Humanities academic in today's minefield of higher education in India for, you are neither the unreasonable table-thumping banner-brandishing revolutionary nor the meekly acquiescent yes-person with no mind to call his or her own. You occupy, you believe, a useful liminal space — but your liminality is devoid of fertility, and it signals the grave for the future of the University in India.

And why would that be so? Consider the scenario of Indian Higher Education, circa 2010. The MHRD is laudably exercised about the shamefully low number of graduates in our country of teeming billions. Our Harvard-educated Minister Kapil Sibal has devised a sagacious plan to alleviate this handicap in 10 years flat: a multipronged attack by which the number of graduates in India will leap from 14 million to 44 million by 2020. As Mr. Sibal outlined in his address to the automobile industry on December 6, he will increase avenues for vocational training that will make a substantially larger number of youth suitably employable. Then he will revitalise the university education system in order, apparently, to rescue it from falling into mediocrity. Most of us should have no quarrel with a governmental desire to produce a variety and range of eligible workforce to contribute to the national exchequer and the notional contentment-quotient in equal measure. So what is it that makes us so suspicious of these avowed measures of prudent ambition being framed by the MHRD now?

We would need to re-examine the blueprint for our university system that dispenses degrees from the bachelor's to post-doctoral levels to probe this sense of the sinister in the MHRD's machinations for now re-carving a utilitarian profile for it. Of the 44 million graduates who will be sent from the best to worst universities in India by 2020, a significant number will presumably still be streaming out of the Humanities: significant not so much in actual numericals, perhaps, as in — as we perceive it — their projected, imagined contribution to the New India apparently still "wandering between two worlds, one dead, the other powerless to be born." Mr. Sibal and his team seem to be of the belief that a birthing needs to be forceped which trims the emergent graduate baby of any of the flab of the imaginative, the ruminative, the philosophical, the archaeological. Cleverly, however, the suggestion is not to throw the baby out with the birthwater, but to muddy the habitation and reroute the pathway: so, energise (a dead) History as Tourism Studies, revitalise (a moribund) Political Science as a Policy Programme, resurrect (an obsolete) English Literature as Communicative Global Language Skills.

To this worthy end, a new governmental body that will map and mould this brand new (or branded) Indian graduate is in process of being set up — the National Commission for Higher Education and Research (NCHER) — that will replace the University Grants Commission (UGC) and function under the direct control of the MHRD, even while the Bill proposing this new commission sanctimoniously professes to promote autonomy for universities: as G. Krishnakumar has commented on the NCHER in *The Hindu* of March 1, 2010, "One discernible tendency in the Bill is to centralise the powers to shape the nature of education. Education was a State subject; it was changed into the concurrent list. The present Bill raises the apprehension whether it would finally become a Central subject." We agree with him that it would be nothing short of "disastrous" to so impair the federal nature of crucial structures in the country, amongst which higher education is key.

And let us not harbour any illusions about the behemoth's capacity to innovate, morph, and engulf critical voices within its belly. The juggernaut believes in efficiency, and will brook no contrary viewpoint. But this augurs well for people who can and do think in terms of finesse and criticality in Humanities studies: because such enormous hubris is likely to sputter, in spite of its acute confidence and suavity. The point is, can the opposition come together, strategise and queer the pitch for this bulldozing machine?

However, just valiantly standing up to this multipronged re-hauling of higher education is an option which has ethical panache on its side but little long-term effect in tangible idioms. Another university group is notoriously pacifist, hoping that the scenario will improve magically: they will have to eventually capitulate and integrate. Otherwise, by the time the 18th century-poetry scholar is forced to write grant applications for doctoral projects funded by the Ambanis and the Tatas for improving communicative skills in their workforce, the script will be lost.

The first station involves consciousness-raising. It is a completely fallacious argument that liberal reform of the Humanities in India means sacrificing nuanced, reflective reading and solid writing skills for a new breed of a cheap, malleable workforce with communicative dexterity to emerge. This is precisely what Mr. Sibal means when he says that we are seeing the rusting of the West and the shining of the East: that the West has human resource but no jobs, while India has jobs but no trained personnel. This is a short-sighted libertarian dogma which has nothing to do with liberalism. Human wealth is not created in serious liberal societies by lowering the benchmark of higher education in this manner. Liberal education is a sustained and controlled matter, where practicality is directly related to searching analyses and the fecundity of thought processes. The real leaders of the market know this, and often get their best recruits from the Classics and Rhetoric departments. It is a pity that the flag-bearers of liberal India have no clue about such a pedigree of liberalism which would actually raise the stakes of a poor and uneducated nation.

Most importantly, those in the Humanities need to develop a long-term strategy that must be deeply critical, but executed with the acumen of deft chess players, flummoxing this vision of New India with crafty manoeuvrings. No one can take away the classroom space. Nor can the MHRD spy around corridors where contrarians and heretics blossom. A subterranean culture of the questioning spirit should foster in these spaces; a new generation of students must be steadily nurtured who will take on the authorities in their laziness of thought and crassness of aesthetics. Alongside, serious research by teachers will provide both moral fibre and scholarly relevance to undermine the seemingly open-and-shut case of the reformers. This is the real democratic tradition of the Humanities that must be salvaged and saluted.

(Brinda Bose and Prasanta Chakravarty teach at the Department of English, University of Delhi.)

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GSLV failures fuel disappointment and anxiety

Can ISRO meet its schedule of Chandrayaan-2 and human space flight programmes?

T.S. Subramanian

CHENNAI: While disappointment haunts the Indian Space Research Organisation (ISRO) about the two successive failures of the Geo-synchronous Satellite Launch Vehicle (GSLV) missions, there is fear whether the failures will affect the schedule of ISRO's Chandrayaan-2 and the human space flight programmes.

The fear is fuelled by the fact that it is GSLV-Mark II with an indigenous cryogenic engine that will put Chandrayaan-2 in orbit in 2013-14. The upgraded GSLV-Mark III, which is under development, will carry two Indians into space in low earth orbit around 2016. Besides, ISRO is hard-pressed for transponders to cater to India's booming telecommunication, telecasting and radio broadcasting requirements.

While the GSLV-F06, with the GSAT-5P on board failed on December 25, 2010, the GSLV-D3, with indigenous cryogenic engine, failed on April 15, 2010. Including these two failures, four out of a total of seven GSLV missions have failed since 2001. The GSLV is a three-stage vehicle. The first stage uses solid propellants with four strap-on booster motors. The second stage uses liquid propellants. The third topmost stage uses cryogenic propellants. The GSLV is 51 metres long.

There is disappointment among ISRO's rocket technologists that the GSLV mission on December 25 failed because of "a very, very trivial issue." They said it failed because the signal from the equipment bay, which houses the electronic brain of the vehicle and is housed atop the rocket, to control the vehicle, did not reach the first stage. A bunch of wires, running to more than 45 metres, convey these signals from the equipment bay and the wires terminate in the three stages of the vehicle. Since these wires are so long, they are connected by devices called connectors, which are akin to plugs and sockets. It is these connectors that hold these wires in place.

- **GSLV mission on December 25 failed because of "a very, very trivial issue"**
- **ISRO hardpressed for transponders to cater for India's telecom, television requirements**

An authoritative ISRO rocket technologist said four such connectors came loose or were prised open because of "some disturbance" in the flight and so the wires, which convey the signal for controlling the rocket, lost their continuity. "If some connectors open up, the wires will not have continuity. It is a very, very trivial issue. So the command for controlling the rocket from the equipment bay did not reach the first stage. An uncontrolled rocket will fail. That is what happened. We are in the investigation mode," he said.

"Simple problem"

Another top rocket engineer also said the connectors coming loose was "a simple problem that did the mission in" and that the rocket's design was basically sound.

The previous GSLV mission in April 2010 failed because of the malfunctioning of the fuel booster turbo pump in the indigenous cryogenic stage.

While the Polar Satellite Launch Vehicle (PSLV-XL), which is much smaller than the GSLV-Mark II, put Chandrayaan-1 in orbit in October 2008, ISRO needs a GSLV to put Chandrayaan-2 in orbit because Chandrayaan-2 is much heavier. It will have a lander and a rover. The rover will drive about on the lunar soil, pick up samples with a robotic arm and do *in situ* analysis.

"Not a major setback"

Informed ISRO rocket engineers are, however, confident that the schedules can be met. The Chandrayaan-2 mission is more than three years away and a series of ground tests of the indigenous cryogenic engine can be done at Mahendragiri in Tamil Nadu to re-qualify the engine. "You are talking of a programme which is three years away. The schedule can be met. Besides, this particular issue [of connectors snapping] is not a major setback," an ISRO engineer explained. (The latest GSLV mission carried a Russian cryogenic engine).

The GSLV-Mark III, which will put two Indian astronauts in space, should be man-rated vehicles. That is, they should be reliable enough to carry humans into space. If the mission carrying the humans were to fail, the prestige of the nation would be at stake, ISRO engineers said.

What worries ISRO is that it is hard-pressed for transponders to meet the booming requirements of India in the telecommunication, television, radio broadcasting and banking services sectors. The failures of the December 25 and the April 15 GSLV missions to put the GSAT-5P and the GSAT-4 in orbit have aggravated the situation.

ISRO Chairman K. Radhakrishnan told journalists at Sriharikota on December 25 that a series of GSATs would be put in orbit in 2011 and 2012, which would meet the country's requirements. Besides, transponders from foreign satellites could be leased.

Mail Today, ND 27-Dec-10 p-11

India needs more educational institutions if it has to increase its gross enrollment ratio in higher education.

THINGS LOOKING

PROFESSOR Narendra Jadhav, Planning Commission member in charge of education, put things in perspective when talking of India's higher education sector. "The average age of an Indian is 24 years today and will be 29 years by 2020. That in China will be 37 years, West Europe 42 and Japan 48 years. So the 'demographic dividend' that has so fortuitously come our way must be harnessed through education and skill development. The importance of education in India today is as never before."

HRD minister Kapil Sibal is definitely in sync with this view, unleashing a series of historic initiatives in the higher education sector.

By implementing the National Knowledge Commission's recommendations to have an independent regulator, the National Commission for Higher Education and Research (NCHER), the education ministry has ensured that the fossilised system of multiple regulators, such as the University Grants Commission and the All India Council for Technical Education, is on its way out.

Along with this, the government has kicked off the legislative reforms process. As Jadhav, also former Pune University V-C, said: "The expansion has to be orderly. Therefore, the need for remedying the existing problems in higher education — through laws."

Four crucial Bills — for foreign universities, educational tribunals, prohibition of unfair practices and for setting up a National Accreditation Authority to rate educational institutions — which the HRD ministry had outlined in its 100-day agenda have been introduced in Parliament.

While these may seem too many changes at one go, there is a pattern in this. At a time when the world's average gross enrollment ratio (GER) in higher education stands at 24 per cent, India's is a lowly 12.4 per cent.

The 12th Five-Year Plan aims to increase this to 25 per cent, but for that India will need more educational institutions.

Sibal often says "we need 800 new universities and 40,000 new colleges if we are to achieve 30 per cent GER by 2020. The government alone can't do this".

So the government has invited the private sector in partnership and asked for more private institutions.

But things are not going as smoothly as they should. The reforms Bills, for instance, are still awaiting parliamentary approval.

Jadhav is, nonetheless, optimistic: "In 18 months, these Bills will be through and the education system will become unrecognisable."

He, however, said the system's expansion must be inclusive.

IN RACE WITH THE WORLD
The 12th Five-Year Plan aims to increase India's higher education gross enrollment ratio from a lowly 12.4% to 25%

Though India's average GER is 12.4 per cent, for poor ST women in rural areas, it is just 1.7 per cent. And this is where the proposed NCHER comes in — it must ensure the reforms are inclusive and has a provision for a government authority to fund deserving students' education.

Not only this, the task force on the Bill for setting up the NCHER has, after consultations, brought back the focus to "quality education" and "research" in colleges and universities.

But here too, the going is not smooth. Landmark provisions in the NCHER, such as a registry of eminent names for selecting V-Cs to central and state universities, have been opposed by state governments.

The NCHER is also facing opposition for trying to include medical and legal education in its purview.

The HRD ministry is, however, hopeful of bringing in this landmark Bill by the next session of Parliament.

The good news is that since the UPA-II came to power, the number of central universities has shot up to 39, with 15 being set up in 2009. Another Bill has the government proposing to have 14 world-class institutions called "Innovation Universities".

The number of technical and management institutions is also rising, with more IITs and IIMs in the offing. And in these top institutes too, the education ministry is pushing for reforms.

Kavita Chowdhury/New Delhi

UP FOR HIGHER EDUCATION

Mint ND 27/12/2010 P-3

GSLV LAUNCH

Glitches may mar prospects at the top end of launch market

Experts say no major impact on India's cost advantage, but add Isro not yet ready to take on top competitors

By Bhargavi Kerur & Jacob P. Koshy

NEW DELHI

India needs to move quickly to address technology glitches that have resulted in back-to-back failures of the GSLV rocket if it is to realize its ambition of competing in the international market for the commercial launch of heavy satellites, experts say.

But the second failure of the Geosynchronous Satellite Launch Vehicle (GSLV) on Saturday is unlikely to mar the country's reputation as an emerging centre for the launch of smaller satellites, they said. India had been hoping to use the GSLV for its second lunar mission, Chandrayaan II, to be followed by a manned mission.

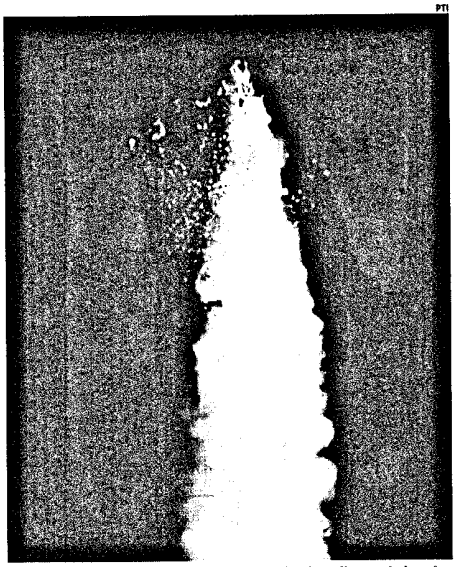
The 418-tonne rocket, carrying a 2.3-tonne communications satellite, lifted off from Sriharikota, Andhra Pradesh, at around 4pm on Saturday in a mission that was aborted 63 seconds later by space agency officials, who concluded that the rocket had veered considerably off its designated flight path. The wreckage fell into the Bay of Bengal.

The geosynchronous satellite (GSAT-5P) it was carrying was built at the satellite centre of the Indian Space Research Organisation (Isro) in Bangalore at a cost of ₹125 crore. The advanced communication satellite, carrying 36 transponders, was crucial for India's telecommunication sector and the weather department. It was meant to replace the workhorse INSAT-2E satellite launched in 1999.

Although the reasons for the failure are being probed, Isro chairman K. Radhakrishnan told a press conference on Saturday that the boosters strapped to the GSLV did not receive command signals to propel the rocket further. The original launch date had been postponed by five days as a valve of the Russian cryogenic engine fitted on the rocket developed a leakage of liquid hydrogen.

It was the second abortive attempt this year to launch the GSLV. The previous rocket, which crashed into the sea on 15 April, had been fitted with an indigenously developed cryogenic engine, and billed as a vital first step towards India carrying out a manned lunar mission in the 2020s.

"Isro should have a few successful launches to demonstrate its reliability and consistency and then only we can get into the market (for launch of heavy satellites)," said K. Sridhara Murthy, former managing director of **Antrix Corp. Ltd**, the commercial arm of ISRO. "There are many boundaries and conditions to apply to demonstrate the capability in international market and the two recent failures are a setback in that direction."



PTI

Consecutive failure: *The rocket carrying the GSLV satellite explodes after lifting off from Sriharikota on Sunday.*

Antrix markets India's satellite launch capability to foreign clients and sells satellite imagery to 20 countries. It has commitments to launch satellites for several customers, including those from Canada, Germany, Italy, Singapore and Algeria.

Over the last decade, India has launched nearly 25 satellites—its own as well as foreign ones—using the Polar Satellite Launch Vehicle (PSLV) developed in the 1990s. Experts say that the PSLV technology is well understood and will continue to help India commercially launch small satellites that weigh less than 2.5 tonnes. India has a significant cost advantage over more established entities in the space launch market.

"Several of the communication satellites, and those used for mapping, weather services are small-sized and these are the ones that Argentina and Brazil are using. This failure might just dent that image, but I don't think this will significantly impact India's cost effectiveness," said Ajay Lele, an expert on strategic affairs and space studies at the Institute for Defence Studies and Analyses in New Delhi.

Lele did, however, emphasize that this only meant that Isro wasn't yet ready to take on the major competitors in the satellite launch market—the US, the European Space Agency, Russia and France—if it wanted to launch satellites that weighed three-five tonnes. India could also still develop its technology for making satellites.

India has used up six of the seven cryogenic engines it procured from Russia.

"We'll need one for the Chandraayan moon mission," Lele said. "Therefore, any programmes after that will require our own indigenous engine and we're a long way from perfecting that. We can still concentrate on developing satellites, which is big business in itself."

Scientific experts say that because the recent failures of the GSLV involved components that were common to the PSLV, the snags were likely to be more "engineering-related" and less about a fundamental lack of understanding about the technology.

"The stage at which failure took place is well understood, as it's common to the PSLV rockets too. It must have been more engineering-related—and here even small errors are hugely magnified and may slip through even the most thorough checks—and unlikely a serious, conceptual worry. By comparison, the April failure was much bigger when the engine itself failed to ignite," said P.S. Goel, a former Isro scientist.

U.R. Rao, a former Isro chairman, concurred and added that the Chandraayan II mission planned for 2013 wasn't likely to be compromised.

"We will have to wait and watch if the other programmes are going to be affected or not. The review is going on at the moment., I don't see any concern for the Chandrayaan II launch at the moment," he said.

Isro launched six GSLV rockets with satellites, of which only two missions were successful and one billed a partial success. The remaining three failed to put the satellites in the intended geosynchronous transfer orbit. The two successful launches were in 2003 and 2004, when an experimental communication satellite GSAT-2 and another for educational purposes, Edusat, were placed in a geosynchronous orbit.

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Business Line ND 27/12/2010 P-3

Launch failure: Pressure now on ISRO's cryogenic project

Madhumathi D.S.
Bangalore, Dec. 26

Scientists and administrators of the nation's space establishment are still trying to come to terms with the Christmas Day shocker, when a presumably tried and tested GSLV satellite launcher went bust soon after take-off. There is apparently now a greater urgency than before for them to perfect and push the indigenous cryogenic stage within the next 15 months.

While Saturday's GSLV-F06 used the penultimate of the seven Russian cryo stages, the other failed GSLV (called D3) of April this year was testing the ISRO-built cryo stage for the first time.

"This (the December 25 loss) is a setback. We had not expected this to fail," admitted Mr S. Satish, ISRO's Director for Public Relations and spokesman.

Asked if the Indian cryogenic stage that is being fine-tuned after the initial failure was being put on the fast track, he said it would be known in the coming days.

The GSLV is ISRO's vehicle to lift 2000-kg spacecraft into equatorial, Earth-facing orbits that are 36,000 km away. The PSLV is its lighter lift for carrying satellites to 900 km and mainly pole-pole orbits.

"There is no issue for the next one-and-a-half years," Mr Satish told *Business Line*. "We should be comfortable with what we have. Thereafter, hopefully we should have our own [cryogenic stage] by then."

NEXT LAUNCH

According to him, the next GSLV was not due for at least 12-15 months. The last Russian stage would be used for the communication satellite that will come up for flight towards the end of 2011-12.

The Indian cryo stage is being ground-tested at its centres in Thiruvananthapuram. "We have identified the problem with the first flight" that failed in April, he said.

ISRO had done the due for the calendar of April 2010-March 2011, and flown two GSLV launches as planned. It had also planned two PSLV launches and one of them is due around February.

DOUBLE WHAMMY

For now, the space agency, Mr Satish said, was equally concerned on two counts: the loss of GSat-5P carrying 36 transponders for continuing broadcast and communication services; as well as the failure of the rocket, which sets back the GSLV programme. However, the existing fleet of satellites would suffice.

In a worst case, the loss of GSat-5P could warrant leasing of capacity on a foreign satellite, he conceded.

>>More on the Web: www.businessline.in/webextras

Business Standard ND 27/12/2010
P-15

IIM-A case studies just a click away

Other B-schools can access IIM-A's over 3,500 cases

RUTAM VORA
Ahmedabad

It's philanthropy of a different kind. The Ahmedabad-based Indian Institute of Management will soon allow B-schools across the country to access its vast pool of case studies, online.

IIM-A is in the process of taking its 3,500-odd case studies online giving easy access to the global management arena. The institute envisages this project to be useful to the smaller B-schools making their academic structure richer.

"The project will benefit smaller management institutes and researchers to get access to IIM-A's high quality case studies. This will be done at a nominal cost for the institutes and corporate, while academics and researchers will get free access to the cases," said a source from IIM-A.

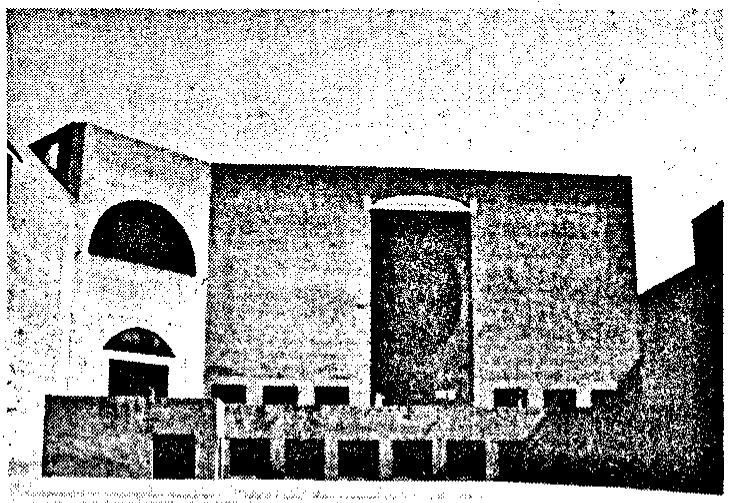
Sale of such case studies is not new to the IIMs. Case studies by these premier management institutes have been in huge demand by other B-schools. "We have been selling the case studies to various interested parties. Of these, over 60 per cent are institutes, some are academic individuals and researchers. We however, get less corporate inquiries for the same," stated another IIM-A source.

The online availability of case study will fasten the process of delivery as well as will provide huge options to choose from.

At present, there is a lot of manual effort involved in providing a case study.

"This is a time consuming process, sometimes even a term is over by the time the required case study reaches the person," added the source.

The digitisation work of the 3,500-odd case studies is over and the editing work is underway at present. However, considering the complexity of the work, the institute declined to give a time-line for completion of the work.



ALL FOR MANAGEMENT EDUCATION

- IIM-A gets case studies from Harvard Business School
- The project will benefit smaller B-schools
- IIM-A will charge nominal price for the institutes and companies
- Academics and researchers will get free access to the cases
- IIM-A conducts an average of 50-60 case studies every year
- Case studies prepared over the past 50 years will be accessible

While IIM-A has put up the bibliographic details and synopsis of the case studies on its portal, uploading of the cases will take place only after the completion of editing work.

A panel of editors have been assigned the job of editing these case studies to make it comparable with international standards.

IIM-A conducts an average of 50-60 case studies every year.

The case studies, which have been prepared over the past 50 years that varies in content, gives a closer look to the corporate and management happenings of the business circles in India. "The case studies are prepared with international standards and touches variety of subjects. Some of the cases are very interesting and give insights into the corporate happenings in the country," said an official handling case studies at the IIM-A.

IIM-A, which gets case studies from Harvard Business School, says it is eager to spread this rich resource of case studies to smaller B-schools.

The cost involved is merely administrative and operational cost that the institute intends to recover. As an academic institute we cannot have an objective of profit-making by selling our knowledge resource," said a source at the IIM-A.

The institute has also developed the gateway for financial transactions, which will enable payments via credit cards on these case studies.

Times of India ND 27/12/2010 P11

Disaster leaves Isro with 1 cryo engine

Arun Ram | TNN

Chennai: Isro is staring at a crisis: it is left with just one Russia-made cryogenic engine and its indigenous version is far from ready. The launch of communication satellites weighing more than 2 tonnes into a geosynchronous transfer orbit, besides India's ambitious space programmes such as Chandrayaan-2 and the manned mission, need Geosynchronous Satellite Launch Vehicles (GSLV) powered partly by cryogenic engines.

The cryogenic engine that went up in flames with GSLV-F06 on Saturday was the sixth of the seven such engines the country had procured from Russia. Post-Pokhran-II, the US had armtwisted Russia to deny the engine to India. Isro tried the indigenous cryogenic engine for the GSLV-D3 launch on April 15, 2010, which was a failure. The engine has gone back to Isro's workshops for ground tests and there is no definite word on when the improved version would be ready.

The cryogenic engine that went up in flames on Saturday was the sixth of seven such engines procured from Russia

"Our stockpile of cryogenic engine has been reduced to one and there are five heavy satellites to be launched in 2011 to augment our telecommunications and broadcasting constellation in space," said a space scientist.

Times of India ND 27/12/2010 P13

Dad's app lets disabled son 'speak' with iPad

Application Turns Touchscreen Into Communication Tool

Raleigh: Victor Pauca will have plenty of presents to unwrap on Christmas, but the 5-year-old boy has already received the best gift he'll get this year: the ability to communicate.

Victor has a rare genetic disorder that delays development of a number of skills, including speech. To help him and others with disabilities, his father, Paul, and some of his students at Wake Forest University in Winston-Salem have created an application for the iPhone and iPad that turns their touch screens into communications tools.

The VerbalVictor app allows parents and caregivers to take pictures and record phrases to go with them. These become "buttons" on the screen that Victor touches when he wants to communicate. A picture of the backyard, for example, can be accompanied by a recording of a sentence like "I want to go outside and play". When Victor touches it, his parents or teachers know what he wants to do.

"The user records the voice, so it's something the child's familiar with. It's not robotic," Paul Pauca said.

The app, which should be for sale by early next week, is one of dozens of new software products designed to make life easier for people with a range of disabilities.

The category is expanding so fast that Apple now has a separate listing for it. More apps are added every week, ranging from Sign4Me, a sign language tutor that uses an animated avatar, to ArtikPix, a flash card-like app that helps teachers and speech therapists improve their students' articulation of words.

MAGIC TABLET: A doctor shows a patient an x-ray on an iPad at the Mayanei Hayeshua Medical Center in Bnei Brak, near Tel Aviv. The iPad enables medical staff to help treat patients, provide consultations and study X-rays and CT scans from afar

"It opens up his mind to us, because he can show us what he's thinking," said Victor's mother, Theresa. Victor has a rare genetic disorder called Pitt Hopkins Syndrome, a diagnosis he shares with about 50 other people in the US. The ailment causes delays in cognitive abilities, motor skills, social development and language skills. Victor's progress, in many ways, has been good — he could walk at age 2, whereas some children with the condition can't walk until they're 10 or older.

The Paucas tried a number of therapeutic devices designed to help people with similar disabilities communicate. These standalone devices are often low-tech — the one the Paucas first tried required paper printouts. Or they are expensive: a top-of-the-line model similar to the one used by famed physicist Stephen Hawking can cost about $8,200.

Paul Pauca, a computer science professor, decided that he and some of his students could do better. Starting in January, they worked to create an app that would use the versatility of the Apple devices to make communication easier. Because the hardware already existed, and the work was done as part of a class, there were essentially no direct costs of development. The prototype was done by late spring.

"We're not a big-budget operation, and that allows us to sell it for $10," said Tommy Guy, who is one of Pauca's students.

Jim Tobias, president of consulting firm Inclusive Technologies and an expert on disability-accessible technology, points out that VerbalVictor takes advantage of general-purpose, mass-market gadgets that cost hundreds of dollars rather than thousands.

People who already own an iPhone or iPad need to pay only $10 more for the app, "instead of taking a risk with $1,000" with specialized machines, said Tobias, who is not involved with the project. AP

Times of India ND 27/12/2010 P13

Hunt for dark matter under the South Pole

DEEP IMPACT: A Digital Optical Module (DOM) descends down a bore hole in the ice as it is deployed in the IceCube array, the world's largest neutrino observatory, built under the Antarctic tundra near the US Amundsen-Scott South Pole Station. (Inset) Close-up of the DOM

Wellington: An extraordinary underground observatory for subatomic particles has been completed in a huge cube of ice one kilometre on each side deep under the South Pole, researchers said.

Building the IceCube, the world's largest neutrino observatory, has taken a decade of work in the Antarctic tundra and will help scientists study space particles in the search for dark matter, invisible material that makes up most of the universe's mass.

The observatory, 1,400 metres underground near the US Amundsen-Scott South Pole Station, cost more than $270 million. The cube is a network of 5,160 optical sensors, each the size of a basketball, suspended on cables in 86 holes bored into the ice. The point of the exercise is to study neutrinos, subatomic particles that travel at close to the speed of light but are so small they can pass through solid matter without colliding with any molecules. Scientists believe neutrinos were first created during the Big Bang and are still generated by nuclear reactions. AFP

Times of India 27/12/2010

p-1

Future forward

Neha Bhatia/TNN

2010-20 has been declared as the decade of innovation and, hence, it is the best time for upcoming professionals to prioritise on innovation. In fact, 2010 saw students and the youth from across the country showcasing several innovations. While a Delhi-based engineering student innovated a 'personal mover' that can be especially used by differently-abled people, Mandar Ramesh Thite from Pune has engineered a photo clipping machine that can preserve newspapers and printed material. That's not all. Subrata Dutta from Kolkata and Kondamudi Swarna Rekha from Andhra Pradesh are working on interesting innovations. While Dutta has made an affordable virtual inverter that can restrict power usage, Rekha is developing a network through which farmers will get an SMS if the water level in their fields dip below a certain level

According to Pravin Rajpal, innovation thought leader, FICCI, "Innovation starts with the inception of an idea. The European Union and the World Economic Forum have stressed on the critical role that innovation needs to play in the near future. Consequently, the challenge for India is to take leadership position in this domain."

Rajpal has come up with a three-dimensional idea generator. Cubical in shape, it comes with a random shuffle option to prevent inadvertent biased shuffling.

Bhairavi Jani, national chairman, Confederation of Indian Industry's Young Indians, said that it is important for Indians to be future oriented in their thought process. "Success involves innovation and it is the youth who need to fuel this innovation. It is not enough to ideate. Implementing as well as making it profitable is the real challenge. In fact, an idea does not become an innovation until it is deployed and implemented," she explained.

Rajpal and Jani were speaking at the recently-held annual convention of the Faculty of Management Studies (FMS), which saw the participation of thought leaders from across sectors.

Jani stressed on the need for people to protect their innovative ideas through patents. Admitting that arranging requisite finances to implement an idea is a challenging job, she agreed to finance any relevant innovative idea that is presented to her body. She also pointed out that critical factors that can determine success for any innovation include pricing, global scalability, sustainability and the overall intention behind the idea.

The need for rural inclusion in India was also stressed upon. Mehmood Khan, global leader of innovation at Unilever, emphasised that management graduates should take the lead in providing solutions to the problems of rural people. "The largely untapped rural market provides an opportunity for companies to expand their business. However, in order to make the most of the rural market, there is a need to empower the rural population," he observed. Khan suggested that innovation must be directed towards upliftment of rural people so that they can play a larger role in the economic scenario of the country.

Publication: The Times Of India Delhi;Date: Dec 27, 2010;Section: Education Times;Page: 40

2010: An academic calendar

EDUCATION TIMES PRESENTS A SNAPSHOT OF THE YEAR THAT WAS

JANUARY: CCE Introduced

The year 2010 started with the introduction and implementation of the Continuous Comprehensive Evaluation (CCE) system by th Central Board of Secondary Education (CBSE) for class IX students.

MARCH: Rise of Liberal Arts

An increasing number of students opted for liberal arts courses in 2010. This trend can be attributed to the fact that the global work environment needs a workforce that has the ability to think critically and take decisions that are pragmatic in reference to a macro social framework.

APRIL: Right to Education Act

The introduction of the Right to Education Act in April 2010 provided an impetus to children from economically marginalised families, especially girls, to enrol into the formal school system. This Act ensures that children between the age group of six and 14 years get free and compulsory education in their neighbourhood schools.

JUNE: Global View to Learning

Countries across the world realigned their academic goals in-sync with new demands of higher education. The Bologna process came to the forefront attempting to make academic degrees and quality assurance standards more comparable and compatible.

JUNE: Education Loans Made Easy

Students belonging to the economically weaker sections were given full interest subsidy on education loans during the period of moratorium.

JULY: Civil Engineers in Demand

Overall demand for improved infrastructure in the country translated to an increased demand for civil engineers.

AUGUST: Resurgence of Traditional Medicine

Plans for modernising hospitals specialising in Indian systems of medicine were on a roll this year. In fact, the increasing interest in this area is in keeping with the government's announcement of a separate national policy for the Indian Systems of Medicine and Homeopathy (ISM&H), a few years ago.

SEPTEMBER: World Rankings

Three ranking agencies — Times Higher

Education World University Rankings, QS World University and Academic Ranking of World Universities (ARWU) complied by Jia Tong University did not figure Indian universities in the top 100. While IIT Bombay was ranked at 187 in the QS rankings, no othe Indian university figured in the top 200.

International Honour

The flagship programme of Indian Institute of Management-Ahmedabad (IIM-A) was rated among the top 10 in the world. The B-school ranked at number eight among 65 institutes for its two-year postgraduate programme in the Financial Times (FT) Business School rankings for its Master's in Management programme 2010.

Education for the Displaced

Education of students, who are victims of regional conflicts, displacements and natural calamities became a focus area. It was realised that in these situations the concept of education needs redefinition and the teachers need to undergo specialised training.

New CAT Tutorials

A new feature called the CAT tutorialwith 12 questions (a demo-version of the actual test) was uploaded on the CAT website. This allows candidates to take the test many times in order to be comfortable with the format.

OCTOBER: Employment Avenues

Commonwealth Games 2010 benefited a range of sectors in India. Job opportunities in sectors such as aviation, hospitality, civil engineering, medical tourism have increased.

OCTOBER: Single Regulatory Body

The HRD ministry proposed several reforms in the area of higher education but the Indian education system being over-regulated delayed the introduction of fresh ideas and innovations in the universities. Hence. the HRD ministry introduced the draft bill on the creation of the National Commission for Higher Education and Research (NCHER), a body that would replace statutory bodies like University Grants commission (UGC), All India Council of Technical Education (AICTE) and National Council of Teachers Education (NCTE).

— Compiled by Aaditi Isaac