

Newspaper Clips

November 15, 2011

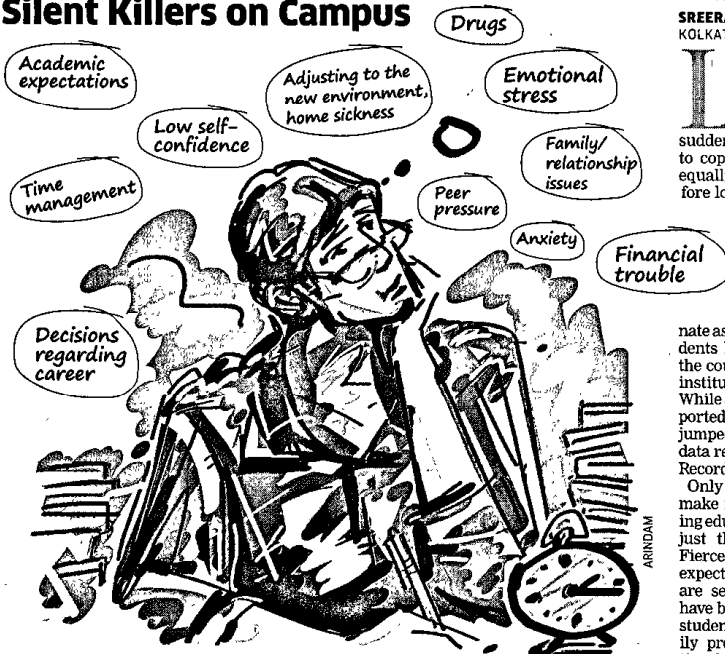
Economic Times ND 15-Nov-11

P-14

IITs, IIMs Devise Ways to Take Stress Head-On

ALL-OUT BATTLE: Technical and management institutes tweak study programmes, promote extra-curricular activities, invite parents to campus and even arrange counselling with psychologists to help students cope with the burden of high expectations

Silent Killers on Campus



SREERADHA DBASU
KOLKATA

Life took an unpleasant turn the moment Abhinav D (name changed) joined IIT Kanpur. A topper throughout school, the 18-year-old suddenly found himself struggling to cope in a class full of students equally bright or even sharper. Before long, he found himself spiralling into depression. A long stint of counselling later, Abhinav is faring better in his studies and is an enthusiastic participant in campus activities.

Many others aren't as fortunate as Abhinav. This year, seven students have taken their lives across the country's premier technological institutes, an unsettling new high. While 5,857 student suicides were reported across India in 2006, the figure jumped to 7,379 in 2010, according to data released by the National Crime Records Bureau recently.

Only the best and the brightest make it through the country's leading educational institutes. But this is just the beginning of the battle. Fierce competition and the burden of expectation — a great job and salary are seen as natural corollaries — have been taking their toll on young students. The issues range from family pressure, adjustment and relationship problems, placements and fear of failure. The good news, however, is, institutes are stepping in to provide support. From counselling cells to student and faculty mentorship programmes, extracurricular activities, changes in curriculum, rescheduling of classes or even giving students the option of switching to slow-track programmes, every effort is being made to ease their burden.

Counselling sessions with qualified psychologists and psychiatrists with assured anonymity are par for the course at the IITs, ISB and other institutes of higher learning.

IIT Delhi has recently started an intensive Student Mentorship Pro-

gramme, where third-year students are assigned five to eight students from their hostels in the same department to have personalised interactions on all issues, ranging from academic to co-curricular participation in extra-curricular activities and general problems. This is especially useful during the initial stay of the freshers on campus, where interaction with seniors is limited, and prevents ragging. Members are selected after an interview. Nearly a 100 mentors are selected for 700-800 freshers. "It's a big help for first-year students, including those from small towns, to make a transition into college life," says IIT Delhi's general secretary, students affairs council, Rachit Gupta.

IIT Kanpur says has been offering extensive counselling services and has even been helping out other institutes, including building a template for IIT Gandhinagar. They have even taken the help of Dr Manas Mandal, director of the Defense Institute of Psychological Research, who has dealt extensively with issues of stress among soldiers.

"For our 700-odd undergraduate students, we have assigned about 200-250 student guides from higher batches to help them with their orientation. Each student guide is again attached to a faculty guardian and all issues are dealt with in a very confidential manner," says dean (student affairs) AK Ghosh. This apart, students are given the option of dropping courses if they can't cope, and making up for it over the summer.

Management schools are not far behind. At Xavier Institute of Management, Bhubaneswar, director PT Joseph teaches 'EQ and Leadership' as a mandatory foundation course. "Students are helped to identify their emotional problems as part of the course. There is a group therapy session with 10-12 students per session,

which helps them build rapport with their classmates so they can help each other," says Joseph.

IIM Bangalore has also taken initiatives to deal with academic stress. "Students who are not doing too well are identified in the middle of the first year and put on a slow-track programme, so they can complete their course over three years instead of two. We are also looking at implementing changes in the grading system from next year," says PGP chairperson Ishwar Murthy.


At IIM Lucknow, director Devi Singh says the moment any sign of problem crops up, the institute gets involved through the student community and faculty. "Parents are informed in a discreet way and we get them over to spend time with the child. If necessary, we even let them take the student away for a few days. That apart, all IIMs have reduced pressure in the first year in terms of the number of courses," says Singh.


Students should be encouraged to participate in extracurricular activities, says VK Gupta, officiating director, MDI Gurgaon. "We have a lot of facilities including a gymnasium, golf, tennis, badminton and so on for students to depress so they can relax and enjoy," says Gupta.


But will all these initiatives ultimately help in curbing student suicides or stress? "Counselling and mentoring are very well, but you can't take away from the fact that in today's world, all of us are ambitious and institutes are constantly driving us to excel. It's hard to maintain that balance sometimes," says Vivek Nair (name changed), a second year student of the National Institute of Technology, Warangal.


It's high time societal mindsets were transformed, says IIM Lucknow's Singh. "We refuse to recognise that stress is a problem; neither do we recognise the role psychiatrists have to play. As we become more urbanised, these problems are bound to increase. Creating institutional and societal infrastructure is a must," he says.


WHAT INSTITUTES DO TO HELP


 **COUNSELLING** is provided at most institutes to help students focus, understand and deal with the issues affecting them

 **THE** counsellor offers support and understanding, and respects anonymity

 **IITs** also offer guidance from seniors and faculty members assigned to them. They are also encouraged to take part in fun activities

 **IIM** Bangalore and Lucknow have made changes in curriculum to allow students to switch to slow-track programmes

 **AT** XLRI Jamshedpur, behavioral science courses help dealing with stress. A home-away-from-home culture is encouraged

 **IIT** Kanpur allows students to drop courses if they can't cope, and making up for it in summers

Publication: The Times Of India Delhi;Date: Nov 15, 2011;Section: Front Page;Page: 1

Less desi students in US, more Americans here

TIMES NEWS NETWORK

New Delhi: For the first time in many years, fewer Indian students are going to the US for higher study, while the number of Chinese students has jumped. But, also for the first time, the number of US students in India has jumped by over 44%.

According to the Open Doors annual survey by the US's International Institute of Education (IIE), students from India decreased 1% to a total of 104,000.

► India ranks 14th for US students, P 19

"Yet India as a destination for US students studying abroad, increased 44.4%," said the survey.

Despite the decline, Indian students represent 14% of all international students in US higher education and the nation is by far the favourite destination for Indian students overseas.

The spike in Chinese students in the US, the survey said, is largely responsible for the country registering 5%

Reversing Trend?

► Students from India decreased by 1% to a total of 104,000

► US students in India (3,884) jumped over 44%

► India has risen to 14th place as a destination for US students going overseas

► China increased its student population in the US by 23% to about 158,000



growth in international students in its colleges and universities during the 2010-11 academic session.

China's student population in the US rose by 23% to about 158,000, pushing it to the top of foreign sources of students in the US. There are also 13,910 US students in China, making for a 2% rise from last year.

Publication: The Times Of India Delhi; Date: Nov 15, 2011; Section: Times Nation; Page: 19;

India ranks 14th for US students

TIMES NEWS NETWORK

New Delhi: India has jumped to 14th place as a destination for US students going overseas. At 3,884, US students in India have climbed by 44%, moving India up from the 21st spot the year before, according to the Open Doors annual survey by the US' International Institute of Education (IIE).

China remains a greater favourite, with 13,910 US students in China, or a rise of 2% from last year. The beeline for India and China is explained by the global interest in these two rising nations.

According to the study, the college campuses that reported increases in the international student intake also recorded more foreign government sponsorships. This applies for a large number of students from China, said others familiar with the flow of international students to the US. Indian students are overwhelmingly private citizens and depend on funding from scholarships and teaching assistantships. After the recession, many of these have dried up, and this may have had an effect on the student flow, they believe. The Open Doors survey said almost 70% of the funding for international students comes from outside sources.

Usually, the number of international students at colleges and universities in the US increased by 5% to 723,277 during the 2010-11



academic session. It said, this was a record high number of international students in the country, the fifth straight year of student increases - fast emerging as a major service sector earner for the US.

"Higher education is among the United States' top service sector exports, as international students provide significant revenue not just to the host campuses but also to local economies of the host states for living expenses, including room and board, books and supplies, transportation, health insurance, and support for accompanying family members," the survey said.

The top 10 most popular fields of study for international students in the US continue to be business and management (22%), engineering (19%), mathematics and computer science (9%), physical and life sciences (9%), social sciences (9%), fine & applied arts (5%), health professions (5%), intensive English language (5%), education (2%), humanities (2%) and agriculture (1%).

Economic Times ND 15-Nov-11

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IIM-C to Weigh Fee Cut Next Year

Rethink comes close on the heels of IIM Kozhikode reducing tuition fees by ₹30,000

OUR BUREAU
KOLKATA

The Indian Institute of Management, Calcutta (IIM-C) will evaluate the possibility of reducing its tuition fees for the next academic year, following a similar move by IIM Kozhikode, IIM-C director Shekhar Chaudhuri has said.

"Even though our tuition fee is not one of the highest, it can still be a burden for a large section of students," Chaudhuri said. The tuition fees for IIM-C are at ₹13.5 lakh for the two-year flagship MBA programme, post graduate diploma in management. Tuition fees for the current academic year were not raised, he said.

IIM Kozhikode earlier this month said it will roll back tuition fees by ₹30,000 from the next academic year for its post-graduate programme and introduce scholar-

ships for high achievers.

"At IIM-C, we have a scholarship scheme, under which we offer to 160-170 students

IIM-C is also tapping newer sources of revenue. Income from online education now accounts for 20% of its total income

annually, covering both first and second-year students. In some cases, we also offer full tuition-fee waiver. Such schemes may also be increased to provide a relief to students," Chaudhuri said. He was talking to the media on the sidelines of the inaugural session of IIM-C's golden jubilee celebrations here on Monday.

Incidentally, IIM-C had said, a few days ago, that it will refund course fees of students if they join a public sector undertaking or a voluntary organisation. The initiative is primarily aimed to

make such jobs attractive to students, who prefer corporate jobs for higher compensation and paying off their education loan.

IIM-C is also tapping newer sources of revenue. For instance, income from online education now accounts for 20% of its total income, says IIM-C's chairman of the board of governors Ajit Balakrishnan. "This is much higher than global institutions like Harvard and Stanford. We have already trained over 4,000 students online," he said.

Former president of India APJ Abdul Kalam said in the inaugural session that students in India need not worry about the slowdown in Europe and the US. "The growing purchasing power of India's 400 million middle-class will provide enough career opportunities. Economic development is powered by creative leaders and who can take risks. However, students should work with integrity," he said.

Academic understanding of history and culture is getting entrenched in power structures and political ideologies. The Ramanujan issue unfolds a bigger problem—of freedom to choose and access bodies of knowledge and learning in our universities.

NONICA DATTA

LAST month, on October 9 the AC (Academic Council) of Delhi University dropped A.K. Ramanujan's essay 'Three Hundred Ramayanas' from the BA Honours concurrent course on 'Cultures of India: Ancient'. The AC and administrative bodies of Delhi University seem to have succumbed to political pressure. Their visceral reaction to any novelty in historical narration and explanation compels me to probe some of the connected histories of the Ramanujan issue that are now unfolding. Let me begin with a small back story. In 2008, ABVP activists vandalized the office of DU's Head of the Department of History, Professor S.Z.H. Jafri, demanding the withdrawal of the essay from the syllabus. He and his colleagues amid shouts of threats stood their ground to prescribe it. But the Academic Council, following the Supreme Court directive, referred the essay to an 'expert committee' to decide the fate of its exclusion or inclusion on the syllabus. Although three of the four experts on the committee recommended the essay, the Academic Council voted for its removal from the course.

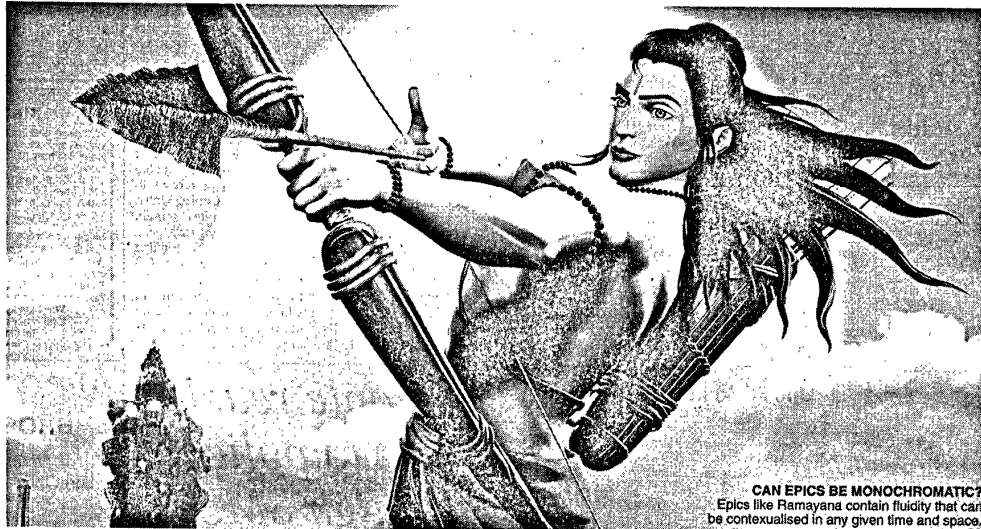
Clearly, the politics of exclusion and inclusion is being played, by both the ABVP and the AC, on the body of Ramanujan's polysemic text through their attack on the multiplicity of oral narratives and their tellings against a monolithic interpretation of the Ramayan. A political group such as the ABVP often chooses an opportune moment to foment a controversy by using a political rhetoric and frequently shows its ugly face. It's not the essay or the text that matters. What matters is the monstrous rationality of the political moment, which is followed by violent implications of censorship, exclusion and denial of knowledge and learning in our universities.

Often, it's in the name of 'raw nerves' that such exclusions are justified. Whose 'raw nerves'? If so, so what? Does this protest actually come from the so-called majority community? Has any student or researcher or teacher raised questions of 'hate/sentiments'? Or is it just a fanning of 'stipulations' for political propaganda, mileage and control? Though all political groups struggle for power, right-wing political bodies, in particular, tend to take a militant and violent stand on issues of 'tradition', 'religion' and 'community sentiments'. History becomes their main body of contest. And yet, it's the larger politics of the present time that defines what we should write, teach and say in our institutions.

The politics of the present, shaped by left or right, destroys the possibility of a creative engagement of history with literature, orality, memory, performative traditions and other lived realities. This is the predicament of history. There's always a secret agreement between the past and the present. The dominant project of history-writing and history-teaching in our country is often informed by a selective reading of the past which has been rationally connected with the political exigencies of the present.

Ramanujan's essay reveals the complexity of a historical narrative, with its playfulness, performance, poetry and romance. The epic of the Ramayan

FIXING HISTORIES



CAN EPICS BE MONOCHROMATIC?
Epics like Ramayana contain fluidity that can be contextualised in any given time and space.



THE 'CONTROVERSIAL' TEXT

"The number of Ramayanas and the range of their influence in South and Southeast Asia over the past twenty-five hundred years or more are astonishing. Just a list of languages in which the Rama story is found makes one gasp: Annamese, Balinese, Bengali, Cambodian, Chinese, Gujarati, Javanese, Kannada, Kashmiri, Khotanese, Laotian, Malaysian, Marathi, Oriya, Prakrit, Sanskrit, Santali, Sinhalese, Tamil, Telugu, Thai, Tibetan—to say nothing of Western languages. Through the centuries, some of these languages have hosted more than one telling of the Rama story. Sanskrit alone contains some twenty-five or more tellings belonging to various narrative genres (epics, kavyas or ornate poetic compositions, puranas or old mythological stories, and so forth). If we add plays, dance-dramas, and other performances, in both the classical and folk traditions, the number of Ramayanas grows even larger. To these must be added sculpture and bas-reliefs, mask plays, puppet plays and shadow plays, in all the many South and Southeast Asian cultures..."

Three Hundred Ramayanas: Five Examples and Three Thoughts on Translation—by A.K. Ramanujan

itself is multivocal and infinite. Consider its rendition by Muslim *Mangiyar* pastoralists in the deserts of western Rajasthan, which is suggestive of its wider reach and imagination in the minds and lives of different people in different localities. The Muslim pastoralists' rendering of the Ramayan in the form of Ram bhajans is composed in *maulkauns* and *bhairav* ragas. The folk Ramayan draws on Kabir, Surdas, Mirabai, Bihari and Tulsidas. The performative experience of the epic slides into the morning performances amidst the accompaniment of instruments like the *khamayacha* and *dholak*. Not just high-or-middle brow entertainment, this is popular culture at its best. Such renditions go against the idea of one Ramayan, one text, one tradition and tend to de-centre the dominant version. Consider also the so-called 'low-caste' nomadic *Bhats'* imaginative compositions of the Ramayan in Rajasthan, which, with a play of language, offer an alternative bardic reading of the epic and produce contradictory, provisional and unstable meanings. In such poetic narrations of the epic, Ram has multiple identities and referents; he is not just the super god, but a human being with vulnerabilities, human desires and failings.

Clearly, there's something in our prevailing methodological point of view that resists the incorporations of such narratives in its frameworks. This resistance works at various levels, but most virulently towards a 'small voice of history'. Exclusions, such as Ramanujan's essay, stem from the way historiography in India—colonial, nationalist, Marxist, communal—has mainly been connected with statism. As a result, contestations are less over history and more over state politics. The multitude of memory and history is silenced through a selective process of remembering and forgetting. History then claims itself to universal and absolute authority and becomes suspicious of alternative experiences and diversity within a 'tradition'. This historiographical movement and consciousness has dominated the prevailing modes of history-writing and history-teaching in our universities. An academic historical understanding of this kind often tends to merge the past with present, and gets entrenched in power structures, political ideologies and bodies of knowledge. It moves towards linearity, uniformity and assertion of a dominant point of view and a singular truth. The political, historical and intellectual frameworks converge to destroy an

interplay of memory and history, merely using the archival and selective history and memory. Different versions are resolutely frowned upon. The structures, dynamics, rhythms of everyday life are ignored. Recently, I wrote a book on a different, parallel reading of Partition in a locality, and crafted a living memory as history. I was confronted with a barrage of questions, accusations and insinuations. Some accused me of not writing about history. Some directed me to be a fiction writer. Some suggested that I had moved from history to method. There was a strong historiographical, academic and official resistance to any engagement with my modest work. My work was a translation and recreation of an unstable, incom-

"The classroom becomes a mere theatre of larger politics. But students come to a classroom to be exposed to plurality of ideas and to develop critical thinking. Wouldn't a denial of diversity of perspectives be criminal?"

plete historical narrative. It sought to unsettle the big story of Partition. Contradictions, ambiguities, uncertainties sculpted my story within a sea of stories. The mode, tone and texture of narration disrupted the coherence of the Partition story and its prehistory. Some called Subhashini, my narrator, a 'communal' subject. But for me, she was beyond any neat categorisation. She was a victim and victimizer and much more. The shifts and repetitions of her narrative questioned the rational and teleological explanation of 1947 and Partition. As my narrative disturbed the prevailing story, and I tried to find a new language of history-writing via different methodological interventions, I realized that though my work opened up the historian's territory, it nevertheless was not smooth enough to be considered as academic and historical. The lack of a fluid, creative openness in our academic historiography and institutions is obvious.

The academic excision is also entrenched in our curriculum, in our modes of teaching, and it finally gets expressed in the classroom. The classroom becomes a mere theatre of larger politics. But students come to a classroom to be exposed to plurality of ideas

and to develop critical thinking. Wouldn't a denial of diversity of perspectives be criminal? The inclusion of the Ramanujan essay in DU's BA Honours course was a matter for celebration. To familiarise students with a multilayered structure and form of an epic is very welcome. Ramanujan's essay introduces students to interdisciplinarity, for this course attracts students from political science, sociology, geography, economics and even maths. Its exclusion is a denial of a nuanced and imaginative approach.

But this exclusion isn't a one off. There have been systematic exclusions from our curriculum. In our university, where I've taught for nearly 13 years, the historian is more important than history itself. We teach the worldviews and positions of historians more than history's complex pasts, memories and dissonances. There's also a bias towards north India at the expense of other histories like the northeast and south. The factors that decide our curriculum are not always academic. The decision-making bodies do not realise the need to expose students to different local and regional perspectives and versions. There's a constant pressure to police the curriculum at undergraduate level. Battlegrounds are drawn between who is on which side at the expense of making the curriculum more enriching.

At the functional level, such university-level decisions are independent of undergraduate teachers, who are directed to teach these courses at the command of the departments. There's a disconnect between research and teaching at undergraduate colleges. What we teach is not related to our research. There is disconnect and hierarchy between undergraduate teachers and university departments. Prescribed textbooks and recommended reading lists are imposed from above. There's no fun in classroom teaching. The student and teacher thus become paranoid and exam-oriented at the expense of critical thinking, questioning spirit and open-ended inquiry. There's something structurally unequal and flawed about our undergraduate system.

The Ramanujan issue unfolds a bigger problem of freedom of access to bodies of knowledge and learning in our universities. The academic community stands exposed in front of our students for dropping something and including something else at the behest of the AC. Students are silenced along with many undergraduate teachers. In such moments, undergraduate teachers are made to feel that they don't matter. A sensitive teacher conveys her predicament in the classroom, while students express their complete outrage and anxiety at such arbitrary exclusions. Students' curiosity about divergent perspectives is palpable in the class. They relate more to difference than to uniformity and universality of approach and argument. They want to hear a different story than the conventional. Parallel human narratives, like Ramanujan's, evoke empathy and sensitivity amongst them.

This essay has even been dropped by a leading university press. Such is the politics of the present, and *dividha* of history. Despite its multiple exclusions, Ramanujan's essay will always be on my reading list.

(The writer teaches history at Miranda House, Delhi University)

Mail Today ND, 15/11/2011 P-10



by Jyotirmaya
Sharma

DU essay row mirrors the rot in higher education

THE REMOVAL of A.K. Ramanujan's essay on the *Ramayana* by the Delhi University's Academic Council is disgraceful. So is the way in which the Vice-Chancellor presided over this Goebbelsian purge through propaganda. But the episode hides the callousness with which we treat ideas, especially ideas that do not seem to fit our cherished myths. Ideas question our sense of comfort, challenge our self-deception and assail the banality of our self-image. No amount of signing petitions and writing to the HRD minister would redress the damage this shameful episode has done to intellectual freedom in Indian universities.

The academic community will have to find new ways of dissent. For instance, the emails of the VC and all those who voted in favour of removal of the essay ought to be clogged with copies of the essay, and I mean hundreds of them. This must happen every single day every hour, for weeks and months, for as long as the people responsible do not express contrition.

Scenario

It is likely that some of them will eventually read the essay and realise their folly as well as admit their ignorance. Students and teachers must gather outside the VC's office and outside the offices of those who favoured the removal and read aloud the essay. The din caused by Ramanujan's wisdom must paralyse the day to day functioning of people who revel in parading their insolent might. Waking and sleeping, these men, who are enemies of ideas and excellence, must be made to encounter Ramanujan's prose. Teachers must begin to teach and discuss the essay in class, whether it is on the syllabus or not. The assault on the written word must be countered by the greater power of the *akshara*, that which does not perish.

There is no doubt that these episodes will continue to happen and haunt us till we do not address questions that plague university education in India, and especially higher education. No sensible individual can question the goal of providing access to education for all those who want to avail of the opportunity for higher education. But access and excellence must go hand in hand. Higher education must be about excellence. But excellence does not mean phoney elitism or social snobbery. Neither does it have anything to do with the technocratic-managerial argument of meritocracy. It has much to do with raising the bar of the kind of

questions that are asked, the manner in which these are posed and the solidity of research that emerges out of it.

For that to happen, the school system and the regime of undergraduate education have to be qualitatively lifted and enhanced. Further, the academic departments have to be granted genuine autonomy and not be hostage to the game of numbers that is often played out in bodies like the academic councils in the name of democratic functioning. For departments to be autonomous, they must be made accountable and funding ought to be tied to their performance across rational parameters. Too much today depends on the grace and favour of bodies like the UGC and university administrations.

But thinking about higher education seems to be going in the opposite direction. There are moves to standardise higher education at the national level,

an attempt that hides behind the rhetoric of greater mobility of students but has at its core the idea of watering down standards. Higher education cannot deliver till such time it is controlled by a bureaucracy at the top, aided by mediocre academics whose business it becomes to help water-down standards for the sake of their own survival.

Teachers

Neither can the market become the sole arbiter of excellence. A substantial part of the blame lies with teachers: they have pandered to furthering mindless representation of ideologies, fashions, notions of political correctness and populism. In other words, they have simulated what politicians and demagogues do best.

In times of crisis they have resorted to taking help of politicians and political parties rather than sorting contentious issues within the confines of their institutions. Moreover, higher education has survived too long on the empty rhetoric of 'nation building', an abstraction open to mul-

tiplike interpretations and political interventions. This is so especially when what constitutes the nation and its interests are susceptible to ideological and political interpretations.

The way teachers treat students, especially in the realm of higher education, is part of the problem. A misplaced paternalism exists where, instead, there ought to be friendship and partnership. Teachers and policymakers continue to treat students reaching postgraduate studies as children who need to be led, guided, and protected from what they consider as dangerous trends. Instead of showing the way to intellectual freedom, students are told to be careful of things that might harm their intellects and, in turn, harm the nation.

Our collective insecurity as a nation and our valorisation of smug mediocrity in the name of the nation's interests turns students from free individuals to slaves. Denying access to a certain kind of literature is, in fact, the modern manifestation of caste elitism, where some texts are denied access because of a higher reason prevailing, which

denies that access. If literature of all sorts is available, the students would be able to make their minds up about what to them would be the most tenable and convincing argument.

But academic bureaucracies have little respect for ideas, and even less respect for the end-users of the system in whose name they seem to exist and seem to flourish.

Solution

The lesson from the Delhi University episode is also that banal Hindutva has no ideology or political affiliation. It cuts across party politics. If this move had been initiated by Murlimanohar Joshi, people would automatically impute ideological motives to it. But this shameful act of removing an essay has happened when a Congress-led government is in place and in a place where a Congress ruled government rules Delhi. Banal Hindutva thrives on mediocrity, amorality, conformity, smugness and misplaced certainty.

The solution to this lies within the university. Those who supported this move have to be shamed and their shallowness exposed. But the community of teachers and scholars must rise in order to assert their academic independence and their administrative autonomy. Otherwise, their fates would continue to be sealed by twenty five men and women, within which number are several beholden to the arbitrary power of the Vice-Chancellor, many of them quiet and indifferent, and a handful allowed to commit crimes against intellectual excellence and flourishing.

Delhi University must show the country that they are ready to take their destiny back into their hands, not by running to ministers and politicians, but by fabricating a new vocabulary of dissent.

The writer teaches politics at the University of Hyderabad



letters@mailtoday.in or
editorsoffice@mailtoday.in

By 'chemical
twittering',
bacteria
control the
behaviour of
the colony

Bacteria CAN TALK!

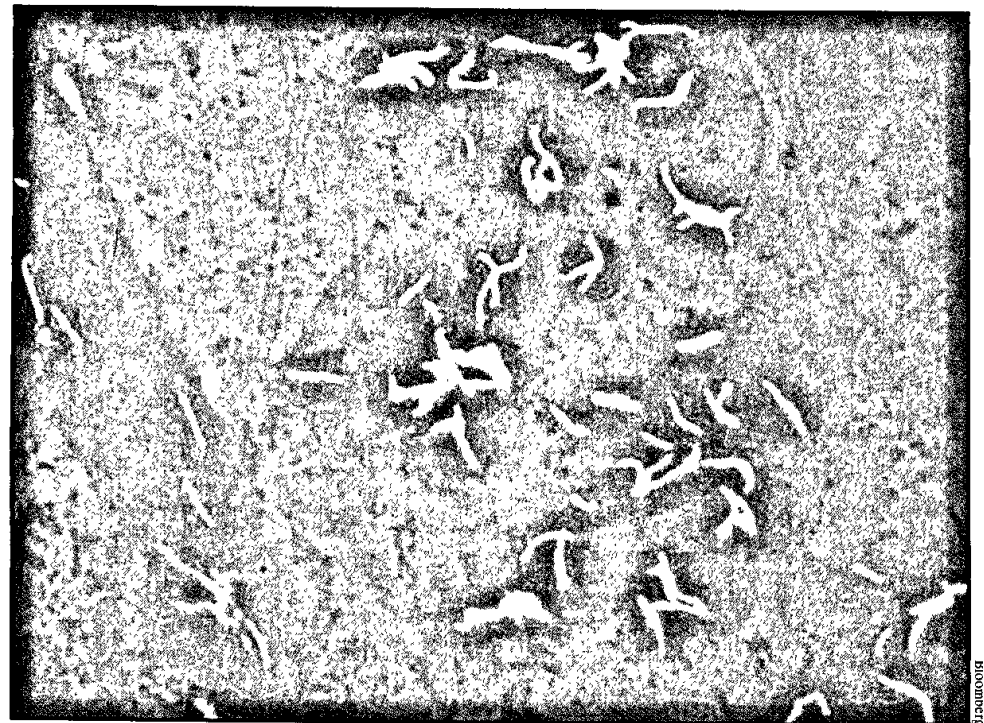
PURNENDU GHOSH

BACTERIA, like humans and insects, possess social intelligence. Like us bacteria have the capacity to perceive and understand the environment. When in a group, bacteria can sense the environment, process information, solve problems and make decisions so as to thrive in harsh environments. In good times, when there is enough food, they know it is good for them to keep the surplus for the future. They know how to keep them safe from other species, and how to prevent other species invading their space. There are also instances of bacteria committing suicide for the sake of others; under nutritional stress, the dying bacteria lyse to release nutrients for the benefit of their compatriots.

Bacteria talk to each other in chemical language. They have a "sense of quorum" and the "quorum sensing" is dependent on population density. It means that the "chemical twittering" does not happen until the bacterial population density reaches a certain threshold value. When bacterial numbers reach a critical mass, individual cells secrete signalling molecules that control the behaviour of the colony. Many species of bacteria use quorum sensing to coordinate gene expression. Bacteria, for example, use quorum sensing to decide whether or where to form biofilm:

Eshel Ben-Jacob of Tel Aviv University and his team studied social capabilities of bacteria. The team sequenced the genome of 500 bacteria, and on the basis of comparative analysis they developed a "Social-IQ score" for bacteria.

The score is based on the number of genes a particular bacterial strain has with abilities to communicate and process environmental information, to make decisions



bioimage

and to synthesise offensive and defensive agents as needed during chemical warfare with other microorganisms. Among the sequenced bacteria, the team found *Paenibacillus vortex* to have the highest social IQ score (over 3 standard deviations higher than average). Humans with IQ of three standard deviations above average include scientists like Albert Einstein and Stephen Hawking. Ben-Jacob believes that smart bacteria (high social IQ score) can outsmart pathogenic bacteria. The social intelligence of *Paenibacillus vortex* bacteria is at the "genius range", whereas the social IQ of pathogenic bacteria is generally "average".

Smart bacteria can develop strategies against antibiotics, thus foiling the antibacterial strategies de-

veloped by the researchers. Since we don't give due respect to bacterial social intelligence, we fail to see their potential impact. We fail to see the side of indiscriminate use of antibiotics. Once we recognise this skill in bacteria, we can develop new possibilities of beating them in the game of one-up-man-ship. Since all bacteria can communicate, one way could be to make the bacteria deaf or mute. Another way could be to make the bacteria talk better, that is in keeping us healthy. Yet another way could be the use of anti-quorum type of compound, says Bonnie Bassler, to make the bacteria "think" they were alone when they are actually in a group. If alone, they don't initiate virulence cascades.

Thus understanding the smart

bacteria can help us to invent new anti bacterial drugs, and at the same time find new ways to better exploit the capabilities of friendly bacteria for our benefit. *Paenibacillus vortex* can be the role model for constructing smart bacteria. Social IQ score can show us the way to develop most efficient bacterium for use in medical, agricultural and industrial biotechnology. A smarter, more flexible microorganism, such as *Paenibacilli*, can be used for "programmable biotechnology", an extension of "synthetic biology", to produce designer biomolecules as and when needed. ■

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Pioneer, ND 15/11/2011 P-1

Wonder cancer drug holds promise Wonder...

PTI ■ LONDON

Scientists claim to have achieved a major breakthrough by creating a "wonder drug" which kills off cancer—in fact, it could wipe out some of the most deadly forms of the disease.

An international team, led by University of California, says that the KG5 drug works by making cancer cells "commit suicide"; it stops tumorous cells multiplying and they then shut themselves down, the *Nature Medicine* journal reported.

The radical drug will bring fresh hope to patients with aggressive and deadly tumours and could be available in as little as five years, say the scientists, who hope to deliver it in pill form, which has very few side-effects.

Lead scientist Prof David



KG5 works in a totally different way to traditional therapies by altering the structure of a cancer growth protein, an enzyme known as RAF

Cheresh said the drug "blocks the function of proliferation" and the malignant cells commit suicide when they can't multiply. Proved effective in tests against pancreatic, breast and

kidney cancers, it could well have a positive effect on a broad range of other tumours.

KG5 works in a totally different way to traditional therapies by altering the structure of a cancer growth protein, an enzyme known as RAF.

The protein has been long-studied, but its role in cell division—critical to cell proliferation and tumour growth—is a surprise. Existing treatments block RAF's activity. However, KG5 changes the entire shape of the protein, which neutralises it without leading to unwanted side-effects.

To date, KG5 has been tested in animals and tissue samples taken from patients.

The team has since developed variants of KG5 that are 100-fold more powerful than the original drug. They hope

one of these more powerful compounds will enter clinical trials on humans at Moores Cancer Centre in San Diego within 18 months.

"Before this drug was designed, we had no idea RAF could promote tumour cell cycle progression. This may be only one example of how, by designing drugs that avoid the active site of an enzyme, we can identify new and unexpected ways to disrupt the growth of tumours.

"In essence, we are attacking an important enzyme in a whole new way and thereby discovering new things this enzyme was intended for," the Daily Express quoted Prof Cheresh.

At present, medicines that target enzymes like RAF often damage healthy cells, according to Prof Cheresh.

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"They hit many different targets, meaning they can produce undesired side-effects and induce dose-limiting toxicity," he said.

Rather than homing in on a particular part of the protein, the new class of RAF inhibitor alters the enzyme's whole structure. It singles out RAF in proliferating cells, while ignoring normal or resting cells. KG5 also acts by cutting off the blood supply to tumours. Dr Julie Sharp of Cancer Research UK, welcomed the new findings, saying, "The next step will be to test out these ideas with patients."

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Balm for broken hearts!

Heart tissue can be regenerated using stem cells

By **Savita Verma** In New Delhi

SCIENTISTS have for the first time shown that stem cells obtained from one's heart can be used to regenerate heart tissue and improve the heart function in patients suffering from heart failure.

Heart failure results from loss in heart function because of the death of heart muscle tissue, mainly due to blockages in vessels supplying blood to the heart. Thus the heart's pumping function is affected, which is known as decreased left ventricular ejection fraction (LVEF).

Currently, there is no treatment which can address the problem of the loss of heart tissue. Scientists say it is now possible to regenerate heart tissues by using cardiac stem cells drawn from the patient. The results of human trials of this technique were

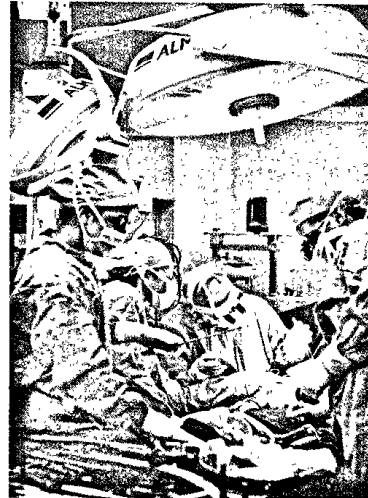
announced by scientists in the medical journal *The Lancet* on Monday. The trial was conducted by University of Louisville and Harvard Medical School.

"If regeneration of heart tissue becomes a treatment option for patients with ischemic cardiomyopathy, that is those whose heart cannot pump enough blood due to the blocking of blood vessels, it will be the most important medical discovery of our lifetime," John Loughran, one of the researchers from University of Louisville, said.

The trial involved 23 patients with heart failure caused by heart attack. All these patients had undergone surgery. Of these, 16 had received heart stem cells obtained from their own heart while the remaining seven received standard care without stem cells. One million stem cells were given via a balloon catheter approximately after four months of the bypass surgery.

In 14 patients who received stem cells, heart function improved — LVEF increased from 30.3 per cent before the stem cell treatment to 38.5 per cent at four months after treatment. In patients who had not received stem cells, the LVEF did not change.

Scientists said the positive effects of stem cells



INNOVATION: A heart surgery in progress.

treatment became more pronounced at one year of treatment in eight patients with LVEF increasing by 12.3 per cent from 30.2 per cent before treatment to 42.5 per cent. Treatment was shown to reduce the size of the heart's dead tissue in seven patients on whom an MRI was done, by 24 per cent at four months and by 30 per cent at one year.

An adult heart contains stem cells which are able to multiply and differentiate into different types of heart

Treatment showed no adverse effects

cells. Treatment with stem cells led to increased functional capacity. There were no apparent adverse effects for up to one year.

Stem cells were isolated from about one gram of heart tissue taken out during heart surgery. Stem cells can be grown even from smaller samples of heart tissue taken out during biopsies.

Commenting on the work, Gerd Heusch from University School of Medicine, Germany, said the results raised new optimism because the study reported benefits which are of an unexpected magnitude.