

The proposal for a National Science University – some comments

I fully share your apprehension regarding the success of the proposed National Science University, viewed from the narrow angle of the emergence of the IIT system and its present condition. The IIT system might occupy a very privileged place in the heart of the public mainly because of its continued incorruptible (albeit mulish) method of admission at the undergraduate level, to discernible eyes it is beset with innumerable problems. Here I will confine my attention to undergraduate science education only. In all the fora there is a serious concern about the working of the university system; we have completely ignored the fact that most universities are of affiliating type; very few participate in actual undergraduate training. Even the new Central University at Hyderabad has fought shy of undergraduate programme. Most educationists pay attention to control/supervision of undergraduate education. The few universities of the unitary type are also attempting to shed the undergraduate programme; yet we all shed tears for the deplorable state of undergraduate education. The idea of autonomous colleges was conceived to fill in the lucuna; in 1983 it was observed particularly by enthusiasts in Madras that there were a few autonomous colleges in Tamil Nadu and that the only autonomous institution outside Tamil Nadu was BITS at Pilani apart from the IITs. I do not think that the situation is any better now. Under these conditions and along with the added financial crunch which is fully borne by undergraduate training institutions, it will be the most irresponsible act to go ahead with a Science University with a mega budget and all that. Everybody will be enthusiastic about it because it fits in with our 50-year-old practice of 'building the infrastructure'. I am also cynical about the tall talk of academic freedom of the university. The charter of the proposed university may be excellent. I only draw the attention of the academicians to the scant respect that is paid to the charter by the bureaucrats egged on by politicians. The most glaring example is the manner in which the 5-year B Tech programme and 2-year M Tech programme was

converted respectively into a 4-year and 3-semester programme. The council of IITs is still in the process of considering the dissenting views!

I have a suggestion. There are autonomous colleges that have a full stake in undergraduate education; a few can be chosen for augmenting the infrastructure and they can become a science university by performance. To my mind the Madras Christian College and Loyola College, Madras, get singled out; a search can be made to identify potential institutions in other parts of the country. It is surprising that Indian Statistical Institute (ISI) did not find place in any of the reports that were published. I mention this for the simple reason that ISI had recently launched on a massive undergraduate training programme leading to first degree in Statistics/Mathematics. In fact well informed educationists are eagerly looking for the results of this experiment. It may be a good idea to back up the ISI and strengthen the system by generous grants for additional infrastructure to extend the programme to other disciplines.

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I was amazed by the NSU proposal and I fail to see any worthwhile reason for establishing NSU. To me the proposal seemed to be one more typical example of espousing one's own ideas in a bombastic manner which will have a sway on many educated people including the government. I regret to say that even the administration situated in the ministries is blind to the field-facts, otherwise, how can one guarantee that there will be no bureaucratization in NSU and rules will be at the minimum, and how can we ensure that all the students and the staff will be genuinely interested in research and studies? If one can do that in NSU, then why not do the same in the existing institutes?

Can any body show a single institute which is free from the above maladies? How will the selection pattern in NSU be? Today we are selecting the best of students in our IITs and IISc. How many of them are genuinely interested in science and dedicated to national development? For that matter, how many of our young researchers are really interested in those things? If the answer is yes, then Indian R&D scenario would not have been as grim as today. Actually, our youth needs lucrative money offers and ready-made facilities to work. It is this attitude of our youth which is largely responsible for the lack of originality in most of our research.

I always wondered why IITs boast of their graduates and post-graduates going to USA and Europe for work. Actually, it is a matter of shame that we produce such graduates who lack the will to contribute to their own Nation. If our country lacks facilities, then these have to be developed; they are by no means available ready-made. A classic example is the spectacular development of western science. How dedicatedly might the scientists there have worked to attain the present level of standards? Even today we see newer and newer developments. Where is that spirit in India? We always complain about funds, facilities and meagre living conditions. Just look at our youth: hardly will you find the spirit to work for the nation and genuine interest in research and developmental work. Their outlook is oriented to materialistic fun and enjoy-the-life attitude which is falsely called as western culture. Under these conditions, the idea of establishing NSU is nothing but utopian. Instead, interested NRIs should strive to improve the present standards of our universities and research institutes by funding them liberally in order to improve the working conditions. Only then, is it possible to enforce a strict discipline in our academic system, thereby it is possible to inculcate a strong sense of Nationalism and Commitment in our youth.

As D. Balasubramanian pointed out, by establishing NSU are we not accepting the failure of the giant UGC

system of university education and research, which is like chopping off the base-roots of a giant tree? By NSU are we not consolidating the elitist approach in education? Already, certain institutions in our country are given elitist status and are pampered. Actually, our policy should be such that educational standards should be the same throughout the country. Why a graduate or post-graduate from certain institutions should be treated as privileged, I fail to understand. By this, are we not perpetuating the feudalistic system in our education field? NSU will be a step forward (or backward?) in that direction!

Actually, the problem with our people is that each person in a responsible position will come up with his own concept and try to defend it at all costs, many times by showing an unrealistic Utopia on paper. I suggest let us not bring in more systems in our already complicated working ways, but let us modify and strengthen whatever we have. In fact, all systems are good, only the implementation should be sincere and people should have the 'will' to do the things. Without these, to establish a NSU or UU (Utopian University), will be a futile exercise. Let us not shy away from directly attacking the problems. Let us not perpetually spend time in planning how to bell the cat, when it is amply clear that ultimately somebody must come forward and execute the action.

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I found large portions of the text of the National Science University proposal to be vacuous, muddled and naive. However I will be mainly concerned here with just one aspect of the proposal. To wit, who will be the faculty members at the NSU?

The proposal says that after a few years of growth (five years, ten years?) the faculty strength will be around 100–200. Presumably the initial strength will be 40–60. Where will these people come from?

The first possibility is that a majority of them will come from Indian universities. This however seems unlikely since, according to Mahajan, the NSU is supposed to have world class

faculty and the Indian universities are quite rotten. It could be the case that our universities, rotten as they are, still contain enough number of high-quality scientists to supply academic staff for the NSU. This would mean however that the universities would be stripped off their best faculty and as a result would become even more rotten. And this would be done in order to create a role model, i.e. the NSU, which these universities will have to try and mimic later on. This does not make much sense.

The second possibility is that the seed faculty would come from the handful of institutions such as the TIFR and IISc that are granted to be of good quality by Mahajan. Again, the problem would be that the few functioning scientific institutions we have will be cannibalized in order to set up the NSU which will then presumably serve as a beacon to these and other institutions. This also does not make much sense.

The third possibility is that a substantial number of high calibre NRIs would commit themselves on a *full time basis* to the NSU. It is crucial that their commitment is not a part-time one. (I worked for a while at a major research institute which an NRI attempted to run on a part-time basis; it was an unmitigated disaster.) But then who are these NRIs, what are their credentials and where is the evidence of their full time commitment to the proposed NSU?

There are other aspects of the proposal which are equally lacking in substance. To cite just one example, consider the proposed mode of financing this venture. The government of India is supposed to fork out Rs 200 crores with essentially no strings attached and no peer group review. There is a vague promise that *afterwards* an additional Rs 200 crores will be put in by private persons and institutions. No evidence is offered to support this claim. What happens if the Rs 200 crores from private sources does not materialize?

In summary, I feel that the proposed NSU is 'a disaster waiting to happen'. At the very least, it will do further damage to Indian science, which we all seem to agree is already in bad shape.

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Mahajan's assessment of contemporary Indian science is – 'India's contribution to the science and technology of the modern era is disappointingly small', 'high quality research is almost nonexistent.... Moreover, the situation is not likely to improve in the near future..'. About the universities his views are no more sparing. 'Today, the universities are saddled with teachers and professors whose intellectual level is shockingly low, as is their desire to work hard to learn... He sees no redemption because 'The next generation comes out worse than the preceding one, it is not progressive but retrogressive evolution'. The National Centres of research fare no better. In his words, 'The fate of the (research) Institutes is equally tragic... a typical national Institute succumbs to decay very shortly after its birth.'

Though these statements are not altogether false and such statements are also made from time to time by scientists, technologists and academicians living and working in this country a wholesale condemnation of this sort does unpardonable injustice to some of the universities, institutes and research groups turning out more than average performance. However, in providing a bird's eye view of Indian science Mahajan might not have made a special search for such spots. Moreover, only salient features of his report (and not the full text) are available to most of us to comment upon. If anybody's self respect is hurt he/she can take comfort in stray statements in the published articles, not necessarily Mahajan's like – 'The balance sheet of organized post-independence science makes mixed reading', 'in most institutions a holding action seems to be in progress to stem the pace of deterioration', 'one is thankful that TIFR and IISc exist', 'yet, it will be wrong to say that our scientists have failed the country', 'In many areas our contributions have been significant although it could, no doubt, have been better'. While introspection and self-criticism are healthy features mindless over criticism is a sure killer of initiative and enthusiasm whether it is of an individual or an institute. In the articles of Balaram and Ramakrishnan (both from IISc) one expected to find a contradiction of 'retrogressive evolution' of educational institutes discovered by Mahajan. However, no such thing is visible. The learned professors have adopted silence, perhaps, because

their institute is made a merciful exception. The status of JNUs, Central Universities, BHU, IITs and the like is not mentioned, but implied. After saying all this I admit that Mahajan report's main fault is not in the overall diagnosis.

The stunning part of Mahajan's report consists of the reasons he advanced for the low level of education and research in this country and the pedestrian language he used to express them. One would expect a scientist of his calibre (even a NRI) who is advising the Government of India on such an esoteric and serious subject like scientific education and research to have adopted an analytical approach and a more civilized language regarding the scientists and teachers (some of whom would have taught him too), past and present. Without naming any of them he mercilessly bundled all and threw them on the dung heap. I regret to say that the author of such a report evokes no confidence and respect in the mind of a self-respecting scientist, whatever may be the other merits of the proposals and whatever may be the limitations of such a scientist. The mildest of the accusations made against science managers is – 'The scientific establishment is managed by a few extremely powerful people who (a) control most of the money, (b) are on all important job, promotion, and national committees, and (c) decide what are the important areas and directions to explore.' The rest of his description of the nameless managers runs thus: 'This *coterie* of science managers must travel ceaselessly to carry out its numerous commitments . . . , those who control science have neither the time to visit laboratories nor read scientific papers'; 'It is essential for them to give the appearance of being India's leading scientists'; 'They go about creating myths to give substance to their pretensions'; 'They engage in a very egregious form of *gimmicry* (examples given)'; 'They are never held accountable for their consistent *overpromise and under delivery* and are often kicked upstairs (Peter's principle perhaps) for their established sins. The directors of research institutions are given special treatment in the report for the onerous tasks they handle – 'No one may have greater scientific stature or ambition than the director whose specific interests take precedence over every one else's'; 'The director makes use of his

immense power and prestige to *build an empire* by recruiting and encouraging people to work for him (obedient students)'; 'Thus, there comes into existence an *inbred, incestuous* group of meek followers and 'yes men' who are beholden to the director'; 'Thus, the place loses most of its independent, bright and assertive people (often to the United States)'. The last one is a very crucial point in the report taken with the announcement of these 'white knights' willingness to stage a come back to kill the dragons, set free the besieged Motherland and establish 'democratic' science. However, one mystery which Mahajan report has not unravelled haunts some of us – how does it happen that between two cousins (or colleagues) who are scientists or professors the one who stays behind and becomes a director turns out to be a tyrant, feudal lord, dud and cheat while the other who migrates to USA, turns out to be a noble scientist? If we take Mahajan report seriously, (but can we?), all Bhabhas, Bhatnagars, Sarabhais, Ramannas, Arunachalams, Menons, Pillais, Dhawans, Raos, etc. are not only incompetent scientists but also simple and pure cheats and traitors. Of course no names are given by Mahajan but is there any need? If the Government of India accepts Mahajan report, how can they ignore these revelations? Having accepted don't they want to institute at least a 'one man' inquiry into the misdeeds of the science managers – past and present?

The 200 and odd universities in the country are together complimented; 'The insipid and uninteresting teaching leads to a low level of the graduating students who join research programmes' However, a ready explanation is advanced for the miserable state of the universities – 'A momentous decision was made to create a large number of research institutes independent and totally unconnected to the universities This invidious separation, which further (?) impoverished the universities, was a major strategic blunder and has caused as much damage to Indian science as has the feudal character of our scientific establishment.'

I expected in Balasubramanian's comments, at least, an attempt to counteract the sting of Mahajan. He does not comment how far Mahajan's description of a 'Director' fits him. He has no word about the 'feudal character'

of his management and whether in his institute decisions on scientific issues are taken by the administrators, whether he recruits only 'yes men' and whether he or his counterparts in sister organizations are engaged in 'egregious form of gimmicry' and whether he is 'kicked up for (his) established sins!'. It is difficult to understand his silence.

Mahajan and some of his NRI colleagues with the backing of some retired bigwigs in the country, have come out with 'nothing short of a revolutionary and massive rehabilitation programme'. Sweeping aside the 200 and odd existing universities and scores of research centres they float the idea of a National Science University. The details are available in the *Current Science* issue. With an initial investment of Rs 400 crores (about half to be contributed by Govt of India), to be located near an industrial centre and airport (international, for easy hopping by NRIs), free from controls and reservations the NSU is expected to have 'a highly interactive collection of selected undergraduates and graduate students and the best faculty available'; 'every possible material and cultural attraction should be provided to attract and keep the best of our scientists' (reimported from USA?).

If Mahajan and party are given the green signal they promise sure results. However, in the case of an experiment of this type it is difficult to establish ground rules for judging success or failure and even if such rules are found it will take more than a decade to obtain sensible results. Meanwhile, several criteria laid by Mahajan for a NSU are questionable. For example – 1) Do the universities like to take up undergraduate teaching? 2) Is it always possible or advisable to tie up a research institute with a university and vice versa? 3) Is it certain that enough number of NRI scientists in different fields of science are available and are willing to be tied up in universities in India? 4) Is it advisable to base an educational system of a country of India's size on part time NRI scientists, even if sufficient number of qualified candidates are available? 5) What will be the final fate of the present universities? Perhaps the authors of the report convinced themselves that there are a sufficient number of Indians who deserve only bad education in condemned universities. When the

report says, 'what we want is a place where: the best of our current scientists teach, train and inspire the next generation... etc.' it sounds like Rabindranath Tagore's prayer - 'where the mind is without fear and head is held high...' without its sincerity and nobility.

It is true that our education (not only of science) and research are in a bad state, but the solution should be sought by a determined effort for improvement, from within. If the concerned people in a vast country like India are not prepared to pull themselves up, it is a myth that a group of NRIs can achieve that. They can even mess up things in an irretrievable fashion. I end up with a prayer 'Lord! save us from the saviours.'

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In times of crisis, we must ask questions that are open to dispute, provided vital problems are thereby raised. The proposal of Mahajan for a National Science University (NSU) and the response of three scientists prompt me to raise certain questions on this proposition.

If one observed Non-Resident Indian Scientists (NRIS) in the US, certain disturbing and amusing truths about them would emerge. Except for a miniscule percentage of the NRIS in the US, most of them are there because of the abundance in the grocery stores there and not because of science, technology or research. The NRIS are a different breed, there is no love lost for India for most of them. The sudden exposure to wealth and abundance makes them feel contemptuous about everything in India. The standards they apply to analyse every situation in India is that of the West, or more precisely American. When I say most NRIS, I do exclude the miniscule fraction of highly motivated, scientifically inclined intellectuals who are not purveyors of platitude.

The NRIS show signs of patriotism and Indian-ness in their forties. Then there is suddenly a love for India and Indian values for a number of reasons which I do not want to expatiate. The NRIS want to return home. Having lived

in the land of efficiency, they find the Indian scenario difficult to handle. The opportunities in India do not match their interest, expectations, ambitions and of course the salary is too low when converted into dollars. Difficult decision indeed! The majority who have vacillations at this point generally end up living in the land of plenty with a split personality and make infrequent visits to India for reasons of rootedness. Those who are well connected manage to return to 'serve' the country when they have exhausted their scientific enthusiasm. They have by then made enough money anyway! There is not much energy left then, because in the US, they were driven, here there is no driving force and the rewards do not match the effort. But, we have generally been enamoured by these NRIS. Many NRIS who come over still do what is necessary to keep the Green Card alive so that the element of risk is very low.

A creative individual is one who takes risks in life at some point or other for what he believes in, to do what he intends to do in life. Our wealth is limited, our infrastructure is primitive, professionalism is lacking and above all there is political and bureaucratic control smothering scientific activity and the scientific mafia itself is all powerful to ruin the career of dissenting scientists. However, there have been silver linings in the dark horizon. I am referring to scientists who have been able to fight and overcome these forces to establish very fine scientific organizations in this country. Talwar who established the National Institute of Immunology, New Delhi and Bhargava who established the CCMB in Hyderabad are just two examples of individuals who had the courage, vision and energy to struggle to make their dreams a reality working in this soil and not succumbing to the temptations of greener pastures abroad.

The sorry state of undergraduate education and the quality of graduate education in our universities is well documented. Other than appointing committees after committees, we have not taken any concrete action to overhaul the educational system. In spite of the poor quality of our undergraduate and postgraduate education, it is indeed surprising that most of the NRIS are doing well, as most of the NRIS would have had their undergraduate education in India before they migrated for the greener pastures. Even

if we want to expand and consolidate our base in undergraduate science education, we can do this in many of our institutions such as IITs, IISc, TIFR, Central Universities, etc., where there are excellent infrastructural facilities and faculty strength.

Creating a NSU by the NRIS is not the panacea for all the ills our universities have been suffering. We need to restructure our universities. We do not have the political will to do that yet. I stress that this can be achieved if and only if we have the political will. Because, everything in the final analysis is political. We cannot dismiss the 200 and odd universities in India saying that there is nothing much that could be done with these existing ones, the only alternative is to start afresh. The poor show of Indian science in the international scene is not a direct consequence of poor undergraduate education as Mahajan would have us believe. This is a sum total of socio-economic-political reality prevailing in India. Establishing a NSU and hoping to take off from there into several NSUs to finally redress all the lacunae in our educational system is just wishful thinking.

India is a large country with tremendous amount of untapped natural resources and creative human potential. To imagine that the sabbatical visits of few NRIS will infuse the scientific spirit in young minds is more than absurd. There are enough talents right here to do this, but are untapped for lack of political will. India at present seems to have realized some of the follies of her past fifty years in the path of development. There seems to be a change in the political outlook of this country. The time is ripe for a change in the university system also.

Mahajan's argument that in NSU no scientist would ever feel the need to become an administrator because of more power, prestige, pay and perks sounds more than Utopian. Is there any parallel for this proposition in any university in the world? Do the presidents of American universities have less pay, perks and prestige compared to a professor there?

Education in modern times is an enterprise, whether it is State owned or private. We have to have the courage and the will to recognize this fact. Of course, the 'gurukula' system and the transmission of knowledge without material gain were all a nice and proud

heritage of our great culture. Times have changed and knowledge has accumulated at a prodigious rate. Transmitting knowledge now costs money. If we have to have good universities, we need money. Mahajan wants government participation in the NSU by providing 100 or 200 crores of rupees and still hopes to be beyond government control! Possibly, with that kind of money, we could restructure at least 10 universities into better institutions if we have the political will. If the NRIS want to invest in an educational enterprise, under the prevailing economic climate in India there is nothing that prevents them. But let them keep away from governmental support. After all some of the finest universities and research centres in the world are private. The best schools run in this country are private schools. There are several NRI businessmen in the US who would probably invest in such ventures. There could even be benevolent NRIS who would make donations like the alumni of Kharagpur IIT who donated \$2 million to his Alma Mater. Let them attract the best talents from wherever they want and show what the results are. The people would be grateful if they demonstrate their love and concern for this country.

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NSU – Another El dorado?

The reasons advanced in Mahajan's report, supported by Srivastava, for the establishment of NSU are mainly based on their thesis that high quality research is nonexistent in most of the universities, National Research Institutions and IITs

Solution offered

The suggested approach to overcome the ills of Indian academic institutions is nothing short of a 'revolutionary manifesto', that is, to

establish a NSU – a 'Brave New World' where:

- a) There will be no more scientific leadership by appointment and no scientific administrators posing and acting as scientists.
- b) Administrators will take up administrative matters and the scientists of scientific matters.
- c) Many NRIs would participate in the venture to repay some of their debt to the land of their birth.
- d) There will be a system of rewards, incentives, media exposure and other perks to improve performance.

There is a vehement disclaimer that the proposal for NSU 'is not an arrogant nonresident solution' for the ills of Indian science. This means, back at home people should take it as a pure, altruistic, transparent offering of their migrated brethren.

Backup required

- 1) Grant of land near a major industrial centre, easily accessible by air (presumably New Delhi).
- 2) A grant of about Rs 200 crores from the Govt of India.
- 3) NSU must be accorded a 'certain special status'. It must have a separate independent charter, without quotas and without binding and suffocating rules, internal and external.
- 4) A 20% reservation for the NRI scientists in the faculty.

Comments

Apart from making some remarks like 'naive proposal, completely divorced from ground realities in India', 'curious mixture of exceptional generalities with undertones of specific inanities', etc., the scientists, whose opinions have also been published, have not categorically stated whether the proposal is as revolutionary as it is claimed to be and if it is worthwhile investing our limited resources in establishing new institutions with the fervent hope that these would remove the existing malaise. None of them seriously considered the possibility of achieving the aim by infusing more life by way of infrastructure, better management, sustained

operational autonomy in, at least, some of the existing centres. I have no hesitation in stating that the proposal of NSU is neither novel nor revolutionary and it suffers from many inconsistencies, self-contradictions and sentimentalities. The expected results are based on fond hopes, wishes and promises, unsubstantiated by coherent reasoning.

The blunder of separating the research institutes from the university ambience, cited as the root cause for the problems of higher education, may be true and should have been and could be rectified. However, a similar pattern is in existence at the research institutes in other countries (e.g. Max Planck Institute). The real reason lies in downgrading our universities as unfit for high-level research, in order to justify the establishment of new institutes (Rob Paul to pay Peter Syndrome)

Many other criticisms levelled at our academic institutions, such as the hierarchical nature of the organizations and rigid adherence to 'procedures' convenient to those in authority, are quite valid. These issues have been the subject of numerous discussions and are on the agenda of various committees. Remedial measures, such as internal autonomy, etc., have been expected to be existing. The real failure is in not implementing and monitoring these simple, self-evident, democratic rules at the grass-root level. Feudalism in India is a social trait. In spite of all refinements introduced in the Indian psyche, due to space time changes, it often reverts like the straightened dog's tail.

It appears to be a common human tendency to boss over. In Western countries too the 'Herr Professors' do lord over their 'Mitarbeiters', but generally for genuine causes and there are checks and counterchecks (to minimize the excesses) built into the system over decades and centuries. Such control mechanisms are practically nonexistent in many (if not all) of our institutions.

The tenor of statements by Mahajan, sounds more 'like fire and brimstone' pulpit sermons of 'born again' scientists. But, it is strange to hear from Srivastava (cosponsor of the proposal) that 'it will be wrong to say that our scientists have failed the country', and yet he asserts that 'Indian Universities, in general, have remained a continuation of their colonial past'. While this