The ability to create new knowledge and the capacity to apply knowledge for development depend entirely on the quality of the human capital. Universities are the gold mine of human capital and are the nurseries for creative talents to sprout. The ability to create new knowledge is almost synonymous with publication of papers with high citation counts. It is a matter of regret that papers with 'thousand citation counts' are either non-existent or rare with researchers at various national research institutes in India with fabulous funding, and equivalently, paper with 'hundred citation counts' is extremely rare with researchers at ill-funded state universities of India with heavy teaching load[1]. The selection of personnel with deplorable academic credentials is the primary reason for decline in the quality of education.

Higher education costs money. The Sarcar Committee appointed to plan IIT Kharagpur had calculated the cost of education at Rs 1460 per year per student at the Imperial College, London and Rs 1520 at MIT, Boston. On that basis, the Government of India had funded the IIT at the rate of Rs 1500 per student per year. The elite educational institutions like IITs were funded then at the same level as the best of the world[2]. It is unfortunate that there is considerable reduction in government funding even for educational Indian institutions like IITs at present compared to the best in the world. The less said about the deplorable funding situations of the state-funded universities, the better it is. Why did it happen? It is perhaps because over the years, not only have the authorities of educational institutes become sterile intellectuals[3] and behave like chameleons, but there is also deplorable decline in the quality and also the vision of the political masters as well as the authorities of the universities, who are concerned only with power. It is unfortunate that instead of safeguarding academic quality, academic freedom, rule of law, and providing required infrastructure comparable to the best in the globe, the concerned authorities are taking shelter behind slogans of globalization, liberalization and privatization to cover-up their failures on the said counts and to justify their surrendering the field of education to private entrepreneurs. The legalized system of 'payment seats' has encouraged corrupt politicians, incompetent lawyers and entrepreneurs who are miles away from education, to establish commercial undertakings as their family business, in the name of educational institutes. In the absence of adequate safeguards on quality, these developments will definitely provide the recipe for disaster.

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Public engagement with mathematics in India

Mathematics pervades our everyday life. It is a branch of knowledge where a 'problem' is a good thing and makes the work of a mathematician interesting[1]. Yet, mathematics research[2] and teaching[3] are on the decline in India. I would like to suggest that a solution to such a situation is engagement of public and specifically children with mathematics.

In an interesting article, Raghunathan[4] notes that mathematics is reaching crisis proportions due to socio-economic factors and suggests measures to improve the economic status of our teachers, and generation of employment for bright students who take up mathematics for study. True, but it seems to me that vital points are being missed here on the reasons for declining standards in mathematics and on ways to improve the situation.

While stating the factors responsible for the deplorable condition of mathematics in India, Raghunathan says that our country has a vague feeling that we are very good at mathematics, but that is not the actual case. He also contests the dubious claims on behalf of Vedic mathematics. But we should acknowledge that different civilizations have developed a variety of mathematical ideas throughout the world, that may be different from what we study in the formal subject called mathematics. But, these native mathematical ideas provide the initial platform for children to learn the notions of numbers, logic, forms, measurement, patterns and spatial configuration prevalent locally[5,6]. The present education system or the present generation of scientists, engineers and scholars should under no circumstances ignore this initial cognitive support to a child. Thus, we cannot underestimate Vedic mathematics. In fact, such systems may have acted as seeds of modern mathematics in ways we do not know yet. Because we have forgotten these systems, basic love for mathematics among children is also dwindling.

In order to improve the situation, we must inculcate the spirit of scientific innovations, including the love of mathematics in young children[7], because that is the only way to increase the endangered global population of a handful of mathematicians that number less than 10,000 worldwide[1].

Furthermore, as correctly recognized by Raghunathan, the problem of decay in mathematics is socio-economic. Hence, it would require a socio-economic solution. In this connection, I would like to invite the attention of parents, children and young people that mathematical skills lead to significant wage premiums in men and women as shown in a recent study in USA by Aparna Mitra[8]. The study also shows that 'women with superior mathematics skill experience wage gains that are comparable to or higher than the wage premiums enjoyed by men'[8]. Encouraging girls to spend more time in high-school mathematics can greatly improve their quantitative skills. Thus there is an added reason for inculcating the love of mathematics particularly among girls, as it is one of the ways to reduce the wage gap between men and women[8].

Finally, while we desperately need great mathematicians who can advance

the boundaries of knowledge, we also love those who can educate and inspire. We should not forget that Shakuntala Devi may not be a great mathematician, but she has inspired many children to love mathematics. We should recognize such nodes of knowledge-networks, including friends, teachers, parents, newspapers, television and books that provide support for learning[9].

To conclude, by engaging children and general public with mathematics, with its innately beautiful problems and with its intrinsic appeal to solicit solutions to those problems, we can hope to make mathematics a way of life for Indians. With such support we may aspire to win the Fields medals and many such honours. When more and more stories of such awards coming to India are published in journals and newspapers, there will be no reason to complain that children do not know the name of even one recipient of the Fields medal or the Rolf Nevanlinna Prize[10].

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Measuring and assessing science beyond *SCI*

The editorial on measuring and assessing science by Balaram[1] has focused on a number of issues associated with this non-desirable exercise of science and technology evaluation. As the scientific community is not satisfied with the existing quantitative indices like the *SCI* and its twin publication the *JCR*, the Vienna-based VICER Publishing has come out with a new index called the European Factor (EF) – a new journal quality factor analysing the best European biomedical journals[2]. The 2002 EF list provides more than 520 European journals with a different formula to compute the EF from the Impact Factor (IF). The top ranking journal, *Lancet* has the EF of 106.06 followed by *Nature* (55.00). Interestingly, the 2001 IFs of these top-ranking journals of the EF database *Lancet* and *Nature* are just 13.251 and 27.955 respectively. Table 1 lists the EF of the top 10 journals as also their 2001 IFs. However, the 2001 edition of the *SCI*/*JCR* lists a total of 5748 journals from all fields of science and technology, with the highest IF of 46.233 for the journal *Annual Review of Immunology*. The previous attempt on the so-called prestige factor has already disappeared from the scene within a short span of a year or so[3], one only hopes that this new initiative will stabilize in the time to come.

Table 1. European factor of top 10 journals as also their 2001 impact factors

Rank	Journal	European factor	2001 impact factor[4]
1	*Lancet*	106.06	13.251
2	*Nature*	55.00	27.955
3	*EMBO Journal*	27.77	12.459
4	*Biochimica et Biophysica Acta*	25.65	2.371*
5	*Brain Research*	25.06	2.489
6	*Journal of Molecular Biology*	22.71	5.826
7	*FEBS Letters*	22.63	3.644
8	*British Medical Journal*	22.33	6.629
9	*Chemical Communications*	19.42	3.902
10	*European Journal of Biochemistry*	18.87	2.849

*BBA – General subjects.

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