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EDITORIAL

Scholarships: Small investments and big returns in science

When I was a pre-university student in the Government Arts College, Cuddalore, Tamil Nadu, the physics demonstrator (designation those days for the lab instructor) told me to fill up a form, sign and give it back to him. He told me it was for entering my candidature for a competitive examination conducted under the aegis of the National Council of Educational Research and Training (NCERT), New Delhi, for the National Science Talent Search (NSTS) Scheme. After successfully clearing the written examination, I was called for an interview at the Indian Institute of Science, Bangalore. I carried with me the small project on gas barometer (made by covering the mouth of a glass bottle with a sheet of rubber from a broken balloon) that I had conducted earlier in my pre-university days. Understandably, in the interview my knowledge of the project was tested, and I had to answer several questions on the kinetic theory of gases. I did not think I performed well and returned home resigned to the idea of continuing in the bachelor's degree programme in mathematics in the same college. But on the advice of my chemistry teacher, I applied to Annamalai University for the BSc degree programme in chemistry knowing full well that it was far from affordable.

Suddenly, one day in June 1967, I received a telegram informing me of my selection in the NSTS scholarship examination, but with the condition that I should study science in one of the selected lists of colleges/universities in the country. Fortunately, the chemistry department of Annamalai University figured in that list. I went to the university seeking admission in the BSc (Chemistry) programme, on the strength of the NSTS scholarship. Despite my excellent grades in mathematics, physics and chemistry in the pre-university, I was not considered for admission in the first round because candidates with such credentials invariably went for engineering studies (and not science)! Since I appeared in person armed with an offer of NSTS scholarship, the then Head of the Department of Chemistry admitted me to the programme after including me in the second list. From then on, my fortunes changed. The scholarship from NCERT was adequate (Rs 100 per month for three years during BSc and Rs 250 per month for two years during MSc) to cover

both my academic expenses and personal sustenance. Mercifully, it came with a book grant too. More important was the opportunity to attend summer schools organized in different universities (Osmania, Pune, Delhi, among others) for five consecutive years for any one batch of NSTS scholars. We were introduced to research right in the first summer and the lectures by outstanding faculty members ensured we reached an excellent scholastic level in chemistry. The concept of summer internship was promoted in later years by the Science Academies through providing scholarship for selected undergraduate students to undertake research in leading institutions. Soon many institutes followed suit.

Over the years, I have come across several scientists in the country who were NSTS scholars. For a few, the money did not matter; for many, it did. Three out of 50 NSTS scholars in chemistry from our 1967 batch were awarded the S.S. Bhatnagar Prize, if that is any indication of the rigor of NSTS selections. One can confidently claim that generation of NSTS scholars emerged as leaders of science in the country. Two Presidents of the Indian Academy of Sciences, Bengaluru in recent times, for example, were NSTS scholars. It would be worth undertaking a formal review of the impact of the NSTS scheme on Indian science.

After the year 1976, the NSTS scheme underwent changes that robbed it of its focus. Then came the Kishore Vaigyanik Protsahan Yojana (KVPY), along the lines of NSTS (written examination followed by an interview), organized by the Indian Institute of Science, Bengaluru on behalf of the Department of Science and Technology (DST), New Delhi, for students wanting to pursue higher studies in science. KVPY scholars were assured admission in the newly established Indian Institutes of Science Education and Research (IISERs). Subsequently in 2008, the DST launched the Innovation in Science Pursuit for Inspired Research (INSPIRE) scheme. The scheme was novel in that the top 1% of the performers in the 12th standard of the school boards across the country were chosen for a scholarship of Rs 5000 per month along with contingency funds. This made a fundamental difference to the growth of the IISERs and

brought in students from all sections of the society. Since the IISERs followed the reservation policy in their admission to the five-year integrated Masters programme and each of their admitted student was guaranteed INSPIRE scholarship (in the first few years of the IISERs), a sizable number of students from the lower rungs of the society and from economically backward states gained admission and succeeded in pursuing a career in science. It brought in gender equity too! It is too early to say how successful they have been. But the initial indications are that the graduates are well placed academically and are likely to emerge as future leaders of science in the country. Unfortunately, the number of INSPIRE fellowships to IISER students was reduced significantly in later years by the DST, resulting in a drop in the number of quality applications to IISERs. Students from economically weaker sections were the worst hit by this move. I remember a student at IISER Mohali who had nobody to support him financially. But for the timely intervention of our Registrar, the student would have left the programme. The institute not only deferred his fees for a while but also helped him to seek a bank loan for completing his study. It so happened that a colleague and I had to sign as guarantors!

After I finished my term as the Director of IISER Mohali, I was asked to serve as the Honorary Director of the Centre for Cooperation in Science and Technology among Developing Societies (CCSTDS), Chennai. This Centre was, in a sense, a reincarnation of the erstwhile COSTED, Chennai, which had to be relocated outside India in 2000. At CCSTDS, three schemes are available for students/scientists coming from developing countries. The INSA–JRDTATA fellowship provides an opportunity for scientists from some of the developing countries to spend three months pursuing research in one of the Indian institutions. Major beneficiaries have been scientists from Nigeria and Cameroon. The DST–ISRF scheme provides a similar opportunity for scientists from developing countries to spend 3–6 months in a research lab in India. Scientists from Afghanistan and Bangladesh have been the major beneficiaries of this scheme. Being larger in scope, the DBT–TWAS fellowship provides adequate funds for students from developing countries to pursue PhD degree in one of the Indian institutions. For candidates with a PhD degree, it provides an opportunity to carry out post-doctoral research in one of the Indian institutions. A DBT–TWAS conclave held in August 2019 in Chennai testified to how these scholars were able to use the opportunity to further their careers. For some reason, Nigeria and Cameroon have been able to utilize the scheme better than other countries in furthering the academics of their citizens. Needless to say, much goodwill exists among the awardees towards India. It is science diplomacy at its best. It costs little but has a huge potential in terms of returns. Sadly, the curtain will fall on CCSTDS on 31 August 2020!

During my tenure as the Vice-President (International Relations) at INSA, I had an opportunity to visit several neighbouring countries that were keen to have their students trained in India. Unfortunately, we have not been able to fulfill their expectations. Predictably, China has been proactive in providing educational opportunities for students from these countries.

It is not necessary that only the Government of India should promote the education of underprivileged students. In the Indian subcontinent, where traditionally the pursuit of knowledge was put on high pedestal, the kings patronized scholars. Nearer our own times, Rajah Sir Annamalai Chettiar established Annamalai University from his earnings in 1929. Often ordinary citizens contributed towards supporting students from poor families pursue higher education. In some cases, the support was for boarding, and in others for lodging (sometimes, families took turns to provide the support). Religious and other social organizations also pitched in supporting poor students in their pursuit of higher studies. Jamshedji Tata took the initiative to set up the Indian Institute of Science in Bangalore on the land donated by the Maharaja of Mysore. Tatas are known to provide scholarships for students wanting to pursue higher studies. The Birlas contributed substantially in providing quality higher education in the country with the setting up of the Birla Institute of Technology and Science (BITS), Pilani. Many alumni of BITS Pilani have turned out to be outstanding scientists. It would be a win-win situation for all stakeholders if more corporate houses come forward to offer scholarships to students.

As higher education is becoming increasingly expensive and beyond the reach of most students in the country, the importance of many generous scholarships cannot be overstated. Currently, there are merit scholarships given by state and central governments. Many institutions also offer merit-cum-means scholarships to quite a few of their students. But that is far from enough. Interestingly, institutions like Harvard and MIT do not turn away poor students. Once such students qualify for selection, their financial support becomes the responsibility of these institutions. In this context, I remember a meeting with the Honourable Chief Minister of a state. He was curious to know how much funds the central government in Delhi would commit to for higher education in his state. In the same breath, he also wanted to know what could be done to promote the higher education of students from villages and especially of girls.

Money invested in funding scholarships to the needy brings to the nation rich dividends like no other investment does.

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