28/12/2003

Spawning creative milieus

Sumitha Martin

PROFESSOR Mohd Ali Hashim has a New Year wish - that Malaysian universities become "creative milieus", spawning scholars and scientific breakthroughs.

Seemingly intangible perhaps but an environment of creativity can be cultivated through simple steps, says the science and technology director with the Ministry of Science, Technology and the Environment.

For a start, libraries and laboratories should be open 24 hours a day for the particular benefit of postgraduate students and academics.

A researcher's creativity, explains Mohd Ali, does not shut off at 10pm and awaken the next morning.

"Some full-time researchers may work through the night and sleep in the day".

Should expensive equipment or safety concerns prompt university administrators to limit students' access to laboratories, alternative safe-guarding measures should be devised; the bottom line being that laboratories must be kept open.

Similarly, in keeping libraries open 24 hours a day, if manpower is a factor, administrators should note that not all library staff are required to be on duty, nor does the entire library need to be open.

Perhaps only important sections such as those which house journals should be kept open for the researcher wishing to look something up at midnight.

If the lack of funds prevents the operation of libraries and laboratories in all Malaysian public universities, well-stocked libraries and state-of-the-art analytical laboratories should be housed in key regions in the country.

A creative environment is also one where a system of rewards is adhered to when funds are allocated.

In this regard, such a system "must assure promotion of the best laboratories, improvement of the average and denial of public funds to the worst", says Mohd Ali.

The director speaks from experience. He was the National Science Award 2001 recipient and is professor of chemical engineering at the University of Malaya which he joined as a tutor in 1975.

His accolades include the NATO Award whilst at the University of Cambridge, the Fulbright Fellowship at Harvard University and the Royal Society Fellowship at the University of Oxford.

He was seconded to the Ministry for a two-year term as science and technology director in July last year.

The science and technology division focuses on the management of R&D funding, human resource development, policy facilitation and the promotion of science.

Yet another basic characteristic of a creative milieu is an informal environment.

Endless meetings - a hallmark of public universities - should be dispensed with and replaced with less time-consuming communication methods such as e-mail.

The informal environment should be such that when one takes a coffee-break, one finds colleagues (who are not away at meetings) with whom one can test a theory or thrash out a principle.

Recalling his experiences as a researcher and as a visiting professor at top universities abroad, including the University of British Columbia and Kyoto University, Mohd Ali says a university should provide an atmosphere of informal interaction that is so basic yet so necessary.

A chemical engineer with a maths query, he says, should be able to

confer with a mathematician next door.

A researcher should not limit himself to his project or field of specialisation.

"The mind should be able to wander", Mohd Ali stresses.

In the long run, this is the sort of environment needed to produce Malaysia's first Nobel Laureate.

To critics of the nation's quest to produce a laureate by 2020, Mohd Ali says, it is not the goal that matters but the journey towards it.

In fact, it does not matter if Malaysia is unable to produce a laureate even after 100 years as "we should be producing a lot of good researchers in the process".

Of the 494 Nobel Laureates honoured for their contributions to physics, chemistry and medicine since the inception of the award in 1901, not one is from Southeast Asia.

The government's Nobel Laureate project took root in a challenge made by former Prime Minister Tun Dr Mahathir Mohamad in 1998.

Incremental steps are being implemented to create public awareness of the Nobel Prize and to inspire Malaysians to strive for excellence.

These include a host of activities such as the Centennial Exhibition, Forum on Creativity, International Conference on Science and Maths Education, Public Lectures and Science Motivation Sessions in the first half of 2004.

That it is an environment of creativity which helps produce a stellar scientist is evident from statistics.

Some 80 per cent of all Nobel Prizes won by the United Kingdom are attributed to scholars from the University of Cambridge; the Cold Spring Harbor Laboratory - a small yet internationally-acclaimed laboratory in Long Island, New York - boasts of at least three Nobel Laureates.

"There must be something special there. When the environment is right, you tend to attract the right people", says Mohd Ali.

Indeed, the "special environment" begins during a researcher's formative years with schools and dedicated teachers playing a major role.

A high school in Turin, Italy produced two Nobel Laureates who shared the same teacher while three Japanese Physics Laureates went to the same high school in Kyoto. Similarly, the Bronx High School of Science has produced five Nobel Laureates.

Therefore, Malaysian schools and institutions of higher learning which have a tradition of producing high achievers need to be further encouraged.

Children, adds Mohd Ali, should be exposed to the wonders of science "as early as possible".

The Ministry's initiatives in this regard includes a yearly RM100,000 to RM200,000 grant under the Innovation Programme for upper secondary students to conduct research in their laboratories or in collaboration with universities and government research institutions.

There is also a pilot mentoring scheme to be launched next year which will see students from select Mara Junior Science Colleges tagging along with scientists at their respective research organisations for a two-week period - the idea being for the youngsters to get a feel of a scientist's life.

A competitive environment in universities, notes Mohd Ali, is crucial in the nation's bid to further develop its science and technology sectors.

Malaysian universities should not adopt a `village champion' mentality. "We should benchmark ourselves against the best universities overseas", he says.

One area in which universities would do well to heighten their competitive abilities is the Intensification of Research in Priority Areas programme.

The programme which received a RM900 million allocation under the Eighth Malaysia Plan has all 17 public universities, all government research institutions and a few private universities as part of some 50 grant

recipients.

While the universities are made to compete with each other for the grants, things are "not competitive enough", says Mohd Ali. The competitive environment must be akin to a race of "who will get there first".

Mohd Ali is still very much in the race. His own area of expertise is separation processes.

Universities, he adds, are perfect greenhouses for fundamental science - breakthrough science in which new theories are formulated and old theories debunked.

"There must be a spirit of competitiveness in the milieu - a strong pressure to perform".

Indeed, competitiveness in science is a well-known phenomenon. Examples of this are the competition between individual scientists, research teams, laboratories and universities.

Over the years however, conditions for awarding grants in the IRPA programme have been tightened, boosting competition.

For instance, while grants were allocated almost as of right to public universities at the start of the programme in the Fifth Malaysian Plan, today a high percentage of IRPA grants are awarded according to specified priority areas such as plant production and primary products; nanotechnology and precision engineering.

Competition was also heightened a few years ago when private universities were allowed to compete for IRPA grants.

The significance of universities in the nation's science and technology vision are manifold and are set out in The Second National Science and Technology Policy and Plan of Action, launched in June (see table).

If all goes well, Mohd Ali's wish may just come true.