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KEYNOTE ADDRESS BY DR TONY TAN KENG YAM, CHAIRMAN OF THE NATIONAL RESEARCH FOUNDATION, AT THE 20TH SCIENCE RESEARCH CONGRESS HELD ON SATURDAY, 24TH MAY 2008, AT 9.30AM AT UNIVERSITY HALL AUDITORIUM, NUS

Prof Chan Eng Soon
Dean, Faculty of Engineering
National University of Singapore

Miss Sum Chee Wah
Director, Education Programmes Division
Ministry of Education

Dr Tan Bee Geok
Deputy Director, Gifted Education Branch
Ministry of Education

Distinguished guests

Ladies and Gentlemen

It gives me great pleasure to be here this morning to celebrate the 20th anniversary of the Science Research Programme or SRP in short, and to witness the excellent work done by our students and mentors.

Science Research Programme

Twenty years ago, I launched the first Research Congress of the SRP – then called Science Enrichment Programme – in my capacity as the Minister for Education.

The aim was to enable our brightest students to have an enriched Science and Mathematics programme, on top of their JC curriculum.

It was to provide them the opportunity to work with established scientists and professors on a one-to-one basis, to have the real taste of world-class research with all of its excitement, challenges, and dilemmas.

The intent of the SRP remains largely unchanged today, but I am happy to see that the SRP has expanded greatly.

When I first launched the SRP in 1988, there were only 38 participants and 35 mentors.

This year, there are close to 100 students and 70 mentors involved in the programme.

Over the past 20 years, over 1,500 students have benefited from the SRP, with the support of mentors from more than 10 Research & Development institutions and agencies – including NUS, NTU, A*STAR, and DSTA (Defence Science and Technology Agency) – just to name a few¹.

I am heartened to see that some of the SRP alumni have gone on to choose blossoming careers in scientific research.

Assistant Professor Peter Ho is one such example.

He won the Young Researcher Award by NUS this year, and is one of the up-and-coming scientists in the NUS Department of Physics.

There are also others who have chosen careers other than in research, and I believe that their experiences in SRP have put them in good stead to do equally well.

¹Other partner organisations include: Defence Science Organisation (DSO), Republic Polytechnic, Institute of Materials Research & Engineering (IMRE), Institute of Bioengineering and Nanotechnology (IBN), Institute of Molecular and Cell Biology (IMCB), Tropical Marine Science Institute (TMSI), National Cancer Centre, Singapore National Eye Centre, and Singapore Botanic Gardens.

I would like to thank everyone involved in the SRP who has helped to make the programme a resounding success, from its inception to its 20-year milestone today.

Special thanks go to the teacher advisors from the participating JCs, as well as mentors who have volunteered their time to guide our students.

I am sure you will derive great satisfaction from the high quality of the students' work presented at this Congress.

Singapore's Strong Education System, focused on Mathematics and Science

Mathematics and Science have always been important areas of emphasis in Singapore's education system.

During the 80s when the labour market was tight and wages rose, Singapore's strategy was to restructure our economy – from labour-intensive, low-skilled industries such as textiles and electronic-assembly operations, to higher-skilled and higher value-added industries, such as petrochemical, aircraft servicing, and manufacture of computer chips.

At that time, a sound education system with strong focus on Mathematics and Science helped Singapore move up the value chain, by equipping our workforce with the necessary knowledge and skills to work in the new industries.

Today, this emphasis on Mathematics and Science continues to be important as Singapore moves further up the value-chain into new areas of cutting-edge technology, including the biomedical sciences, water and environment technologies, digital media, precision engineering and nanotechnology.

Mathematics and Science are also important in our rapidly expanding high value-added services industries, such as the logistics and financial services, which require graduates with strong grounding in disciplines like Mathematics, Physics and Computer Science, in order to solve real-world problems, manage risks and create innovative financial products.

For Singapore's economic strategy to succeed, we need to ensure that our Science and Mathematics education continues to be relevant, rigorous and engaging for all students.

Only then can we groom quality engineers, technical specialists and managers to drive Singapore's economy in the high value-added manufacturing and services industries, and nurture top scientists and researchers to apply and create new technologies that will put Singapore at the forefront of research and enterprise.

Singapore has done well in this respect.

Our education system is distinguished internationally by our strengths in Mathematics and Science.

Our Primary 4 and Secondary 2 students came out tops in the 2003 Trends in International Mathematics and Science Study, ahead of 45 other countries, including Japan, Korea and United States of America.

Other countries are keen to learn from us.

For example, the American Institutes for Research recently did a study on "What the United States Can Learn from Singapore's World Class Mathematics System".

US educators have studied our curriculum, pedagogies and training methods, and some US schools are using Singaporean Mathematics textbooks to teach their children.

In Singapore, parents and students pay much attention to Mathematics and Science in school.

Unlike many other countries where there is a downward trend in the proportion of students studying Mathematics and Science, almost all our students study Mathematics and Science at the O- and A-levels.

Today, all of our O-level students offer at least one Mathematics and one Science subject.

More than 82% of our A-level students study at least one Mathematics and one Science subject, and well over 90% study at least one Mathematics subject.

In addition to this broad base, our top students have ample opportunities to further pursue their interests in Mathematics and Science, so as to stretch them to their fullest potential.

For example, the NUS High School of Mathematics and Science provides an enriched curriculum in Mathematics and Science, where students are able to customise their learning according to their interest and aptitude in different fields.

The new School of Science and Technology, which will begin operations in 2010, will offer students more opportunities to further their interests in applied learning and build strong fundamentals in Mathematics, Science and Technology.

The revised A-level curriculum also allows students keen on going beyond the curriculum to undertake research projects at the H3 level.

Since 2006, the SRP has been included as one of these research opportunities for interested students.

Beyond our schools, this emphasis on Mathematics and Science continues into our post-secondary institutions, particularly our universities.

The National Undergraduate Science Research Programme and the Accelerated Masters Programme allow the top 5-10 per cent of students in the Science and Engineering faculties to pursue intensive research work alongside experienced researchers.

The availability of such research opportunities for students even in their early years of education is invaluable.

Not only would such opportunities enable what some might consider dry subjects to come alive, they provide students early exposures to real-life problems and applications.

Such early exposures would prepare our students well to engage in creative and innovative undertakings in more and more R&D opportunities that are opening up as the Singapore Government increasingly invests in building up our R&D capability.

For example, the National Research Foundation (NRF) and MOE are jointly funding Research Centres of Excellence (RCEs), each with a budget of S\$150 million or more, to facilitate world-class investigator-led research in our Universities.

Three RCEs have so far been announced – the Cancer Research Centre of Excellence, the Centre for Quantum Technologies, and the Earth Observatory of Singapore.

These RCEs span the full range of disciplines in Mathematics and the biological and physical sciences.

RCEs provide additional platforms for post-graduate students to participate in engaging research, and pursue fulfilling research careers after graduation.

Encouraging and facilitating research in our Universities, hospitals and Research Institutes is necessary and fundamental.

But we have to do more.

We have to encourage our research community to move beyond just doing R&D to create new knowledge and publishing their results to transforming the new knowledge to applications that will benefit our society and our economy.

That means nurturing our institutions and people to be more innovative and entrepreneurial.

Transforming our economy into a knowledge-intensive, innovative and entrepreneurial economy is critical in order to continue Singapore's economic development.

With this in mind, the NRF formulated the National Framework for Innovation and Enterprise (NFIE), which was announced by the Prime Minister in March this year.

This Framework will encourage researchers in universities to move beyond pure research to look at how their results can be applied to create innovative products and services.

We hope that some of these researchers will also go out and start their own companies to commercialise their research results.

Such academic entrepreneurship will be a key to sustaining R&D, as these companies will feed demand for new research in academia.

Under the NFIE, the NRF will set up enterprise support structures in universities, establish support for academic entrepreneurship in universities and enhance technology transfer.

One of the schemes that will soon be launched is the setting up of an Innovation Fund for each of our three universities, which will go towards funding innovation and entrepreneurial activities in the universities.

At the same time, the universities will each establish an Enterprise Board to drive academic entrepreneurship on campus, and they will oversee the use of the Innovation Funds for this purpose.

What this means for you, both as researchers and students who might be contemplating a career in research, is that your work will no longer be confined solely to the laboratories.

You will find that results of your work will affect the lives of ordinary people, and thereby create much greater impact in the world.

Conclusion

Ladies and gentlemen, the future is fast-changing, as is the evolution of science and technology.

Emerging fields such as Quantum Science and Research Technology, Nanotechnology, Neuro-engineering and Genomics will gradually take centre-stage in the world of science and technology.

All these will require our students to have a strong foundation in Mathematics and Science, so that they can play an active role in the new and exciting landscape in the years to come.

Ladies and gentlemen, I'm happy to wish all of you a fruitful Congress.