

Asian Educator

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**Prof C N R Rao &
Dr G Madhavan Nair on**

Challenges before Indian Science Education

**WHY IS IT THAT IN THE SECOND HALF OF 20TH
CENTURY, WE COULD NOT RECREATE THE
MAGIC OF THE EARLY PART OF THE CENTURY
CREATED BY RAMANUJAMS, RAMANS, BOSES
AND SO ON?**



**Stop Funding Institutions
Start Funding Students**

Anand Sudarshan

**Universities in Asia
are Rapidly Growing**

Prof Tony F Chan
President, HKUST





Hong Kong beckons

The Hong Kong University of Science and Technology (HKUST) (www.ust.hk) is a top ranked international research university. The Quacquarelli Symonds (QS) Asian University Rankings 2011 has rated HKUST as the top University in Asia. Established in 1991, the University's schools of Science, Engineering, Business and Management and Humanities and Social Science offer a wide array of academic programmes.

Celine George

HKUST focuses on five areas of frontier research -- nano science and nano technology; biological sciences and biotechnology; electronics, wireless and information technology; environment and sustainable development; as well as management education and research. The university has nine research institutes, including the Institute for Advanced Study, which strives to become a global premier intellectual hub, centre of research breakthroughs, and incubator of thought leaders. Currently, HKUST has about 6,100 undergraduate students and 3,700 graduate students.

HKUST first opened its doors to students in 1991. The idea of HKUST was conceived by two leaders with clear vision and strong will -- Dr Sze-Yuen Chung and the then governor of Hong Kong, Sir Edward Youde. In the 1980s, both men realised Hong Kong's urgent need for a university that could propel it towards a knowledge-based economy. Their goal was simple -- create, don't replicate. By early 1986, a Planning Committee comprising leaders and innovators from academia, government, commerce, industry and the community from Hong Kong and abroad was in place and working towards an opening in 1994. After Sir Edward Youde's untimely death in 1986, the plans were put into high gear. The committee, under the dynamic leadership of Dr Chung, pushed the date forward to 1991.

From the beginning, this new university attracted

first-class academics beginning with Prof Chia-Wei Woo, who was the first president of Chinese descent to head a large university in the United States. Prof Woo set the trend for a whole generation of brilliant academics of Chinese descent, who included Prof Jay-Chung Chen, expert in aeronautics and structural dynamics, top experimental physicist Prof Chih-Yung Chien from Johns Hopkins University, Prof Shain-Dow Kung, specialist in biotechnology and Acting Provost at the Maryland Biotechnology Institute of the University of Maryland, and many more. These top scholars in turn attracted other senior academics from North America, Asia and Europe. Ian Macpherson, Hong Kong Secretary for Transport in 1986, was appointed as the Secretary-General to the University Planning Committee and became the first Vice-President for Administration and Business at HKUST in 1990. He oversaw the entire scope of non-academic work in building the new university. By 1991, the university had facilities for 2,000 students. The second phase, completed by the end of 1992, accommodated another 7,000, and provided the full complement of teaching and state-of-the-art research laboratories, classrooms, office space, staff accommodations and additional athletic facilities.

The HKUST campus occupies a 150-acre site of sweeping natural beauty on the Clear Water Bay peninsula in East Kowloon, less than 30-minute drive from Central Hong Kong. ♦

'IN VIEW OF CHINA'S BOOMING ECONOMY AND INVESTMENT IN SCIENCE AND TECHNOLOGY, UNIVERSITIES IN ASIA ARE RAPIDLY GROWING'

Asian Educator: How did HKUST develop into the monolithic education provider that it is now?

Prof Tony Chan: HKUST's rapid rise can be attributed to our positioning as a focused elite research university, our emphasis on excellence in faculty and students as well as on scholarship, and our international outlook. To ensure continued success, we have put in even greater effort in recruiting excellent faculty and students, and we encourage entrepreneurship. HKUST will leverage on China's rapid economic growth and investment in science and technology. At the same time, we will maintain our international outlook and connections in all areas: from our students-to-faculty-to-research, and to global cooperation. We will continue to provide quality and all-round higher education for our own young people to enhance economic development and social advancement. With determination, right positioning and support, HKUST believes one can achieve global excellence in a relatively short time; this applies to education as well as to other areas in life.

AE: Could you please explain the strategic initiative taken by you and your team to make HKUST Asia's No. 1 university.

Prof Tony Chan: While we are delighted that HKUST has topped the Asian university rankings, HKUST's primary mission is to provide high quality education and research. HKUST encourages an all-rounded 'T'-shaped education with breadth and depth, demonstrated by flexible major and minor (dual degree programmes, double majors, majors and minors); and our signature Undergraduate Research Opportunities Program (UROP) that offers undergraduates one-on-one research opportunities with top-notch professors. In maintaining an edge in research productivity,

Asian Universities are becoming more active in developing inter-university co-operations. HKUST thrives to enhance joint-collaborations and academic exchanges with top-notch Asian Universities



Prof Tony F Chan
President, HKUST



Prof Tony F Chan is currently President of the Hong Kong University of Science and Technology. He was previously Assistant Director of the US National Science Foundation (NSF) in charge of the Mathematical and Physical Sciences Directorate, which is the largest directorate of the NSF. In this position, he guides and manages research funding of almost HK\$10 billion a year in astronomy, physics, chemistry, mathematical science, material science, and multidisciplinary activities.

Prof Chan had been in the NSF position since October 2006 upon taking temporary leave from the University of California at Los Angeles (UCLA), where he was Dean of Physical Sciences from July 2001.

Prof Chan's scientific background is in Mathematics, Computer Science and Engineering. He received his BS and MS degrees in Engineering from the California Institute of Technology (Caltech) and his PhD in Computer Science from Stanford University. He pursued postdoctoral research at Caltech as Research Fellow, and taught Computer Science at Yale University before joining UCLA as Professor of Mathematics in 1986.

Prof Chan is an active member of many scientific societies, including Fellow of the Society of Industrial and Applied Mathematics (SIAM) where he served on the Board of Trustees and the Council. He is also a Member of the American Mathematical Society, and the Institute of Electrical and Electronic Engineers (IEEE).

His current research interests include mathematical image processing and computer vision, Very Large-Scale Integration (VLSI) physical design and computational brain mapping. He has published over 200 refereed papers and is one of the most cited mathematicians.

This is what he shared with *Asian Educator* during a recent interview:

HKUST has made a distinction by being a focused research university with a global reputation of excelling in science, technology and business, complemented by humanities and social science

HKUST proactively recruits new faculty, acquires state-of-the-art research equipment, increases funding support for research, especially focusing

on research themes with the five 'O's: NanO; BiO; InfO; EnvirO and CEO. Our faculty and students have continuously made notable academic and societal contributions in terms of research breakthrough.

Recruiting and retaining top quality faculty is critical to our success. HKUST recruits its faculty internationally,

countries. We continue to expand our strategic partnerships with top global universities, like the most rewarding partnership with Kellogg School of Management of Northwestern University and Stern School of Business of New York University.

The university has a firm foothold on mainland China, in particular the Pearl River Delta region; examples include the Industry, Education and Research (IER) buildings in Shenzhen, the medical research centre established in collaboration with the Peking University at the Shenzhen Hospital, and the HKUST Fok Ying Tung Graduate School in Nansha. We have also established the Advanced Manufacturing Institute in Zhejiang. By leveraging on China's booming economy and investment in science and technology, we will strengthen our collaborations

with the mainland partners.

AE: According to you what are HKUST's USPs

Prof Tony Chan: HKUST has made a distinction by being a focused research university with a global reputation of excelling in science, technology and business, complemented by humanities and social science. Alongside its academic strengths, HKUST is dedicated to educating well-rounded students to acquire a strong entrepreneurial spirit, global outlook and innovative thinking

– the necessary foundation and skills for the dynamic world.

In maintaining our reputation as an elite international university, HKUST maintains close ties with global thought leaders from world-class institutions and establish wide-ranging connections with the Chinese mainland. Being one of the most international universities among universities in Greater China, HKUST has successfully attracted a notable profile of foreign faculty members and students.

with a vast majority from leading universities in North America and Europe. In maintaining our ability to attract top talents, we offer globally competitive compensation, including endowed professorships and research start-up funds.

HKUST places strong emphasis on internationalisation. We have a notable international mix of faculty and students. More than 80% of HKUST's faculty have degrees from top overseas universities, while 16% of HKUST's undergraduate students are non-locals – equally divided between mainland China and other

As a home for catalytic interaction among foremost scientists and scholars, the Institute for Advanced Study of HKUST aims to become a global premier knowledge hub, centre of research, and an incubator of top scientific leaders.

Lastly, given its spectacular physical setting beside the sea, HKUST provides faculty members and students an environment that is conducive to the pursuit of intellectual and academic excellence.

AE: How friendly is the HKUST campus, faculty and environment to international students?

Prof Tony Chan: In fostering an integrated and holistic campus, we have coined the concept of '1-HKUST' that provides a framework for HKUST's collective aspirations, synergistic strengths, and collaborative orientation. Under this theme, students from different disciplines are encouraged to co-operate and learn from each other.

To further enhance '1-HKUST', our students actively engage in diverse campus-wide activities. The President's 1-HKUST Student Life Award facilitates better integration among different student groups, both local and non-local. Examples of winning projects include 'UST Great Minds' that allows students to learn from faculty members who are invited to share their passions and 'HKUST Talent Contest' where students from different nationalities join hands in showcasing their collaborated talents.

To encourage international students to get involved in the new campus, abundant student groups are present to provide social support, such as NAUTY (eNjoy the pleAsUres of diversiTY) which is made up of undergraduate students from a variety of cultural and social backgrounds and the International Students Association.

Each year, HKUST organises orientation talks, workshops and tours around Hong Kong for international students and provides useful information about their programmes of study. The university gives them guidance to plan their active student lives, and gives them useful advice to help them adapt to life in Hong Kong and at HKUST.

As an international university, HKUST recruits faculty members from all over the world. All courses are taught in English.

AE: World over, employability of graduates is a major concern. How do you at HKUST reconcile



to this problem?

Prof Tony Chan: HKUST is not a vocational training institute. Instead, we aim at grooming all-round global leaders. We encourage students to acquire and excel in skills which will prepare them for the ever-changing world through our four distinguished schools in science, technology, business, and humanities and social science, echoing with the concept of '1-HKUST' to provide an all-embracing education.

We nurture entrepreneurial spirit with HKUST's Entrepreneurial Program and strive to contribute to the economic and social development of Hong Kong. In assisting faculty, staff and students in the establishment of technology-based start-up companies, the programme has incubated successful businesses such as Radica, which is a market-leading e-solutions provider, and Perception Digital, which transferred its listing to the Main board on Hong Kong Stock Exchange.

Employment surveys conducted by HKUST's Career Center in recent years indicate highly satisfactory employment status of graduates. Close to 99% graduates in 2010 secured job offer, started their own businesses or pursued further studies.

Despite the impact of the global financial tsunami, Kellogg-HKUST EMBA alumni have achieved the highest average salary three years after graduation, reaching US\$392,076 per annum.

AE: As President of HKUST how do you envisage the future of the university and the prospects of China as leading players in education?

In terms of international and Mainland strategy, we intend to fully leverage on China's proactive investment in education, in science and technology in particular



Prof Tony Chan: HKUST will continue to recruit and retain top quality faculty and students. We target a sufficiently diverse international mix of faculty and students in order to continue to ensure HKUST's positioning as a globally diverse university.

In preparation for the 4-year undergraduate educational programme, HKUST will establish a crossover model that magnifies the combined strengths of schools and disciplines to prepare our students for the real world of intersecting disciplines through implementing both in-class and out-of-class learning.

We extend our intellectual strengths to the government, industry and society by strengthening our knowledge transfer efforts to further our impact regionally and globally

In terms of international and Mainland strategy, we intend to fully leverage on China's proactive investment in education, in science and technology in particular. We will also foster and extend a number of strategic partnerships and collaborative initiatives in each major geographical position.

To capitalise on our research vitality, we will establish a multi-pronged approach to reinforce multi-disciplinary research excellence and to further extend our research base beyond Hong Kong through formation of international and regional partnerships and alliances.

We are aware that Mainland China has many emerging talents and they are becoming more determined to build world-class universities. However, the road to achieve academic excellence is a long journey. With our success achieved

in a short two decades, HKUST can serve as a reference for many young universities from the Mainland.

AE: *How do you appraise the prospects of Asian countries developing as an education hub?*

Prof Tony Chan: In view of China's booming economy and investment in science and technology, universities in Asia are rapidly growing and their international recognition ever rising, as confirmed by the fact that 20% of the top 50 universities in Asia are less than 50 years old. The rise of the Asian economy also implies increased opportunities in Asia. Tying in the impact of globalisation, there is a dynamic international flow of talents across the globe. All these factors would attract foreign faculty members and students to station in Asia to take advantage of the prosperous environment.

Riding on the trend of internationalisation, Asian universities are becoming more active in developing inter-university co-operations. HKUST thrives to enhance joint-collaborations and academic exchanges with top-notch Asian universities. HKUST recently announced a joint PhD degree with the college of engineering at Pohang University of Science and Technology (POSTECH). In addition, HKUST also established a joint PhD program with the Korea Advanced Institute of Science and Technology (KAIST), one of the top research universities in Korea.

AE: *Are our universities supportive of our industry? If not, how can we make them so?*

Prof Tony Chan: As a higher education institution situated in Hong Kong, HKUST's mission is to

advance learning and knowledge through teaching and research and to assist in the economic and social development of Hong Kong. We extend our intellectual strengths to the government, industry and society by strengthening our knowledge transfer efforts to further our impact regionally and globally.

In fostering effective knowledge transfer, HKUST has developed a strong culture in partnering with different industries. ◆

