



**OSMOSIS AND BALANCE
IN THE PROFESSORIAL VOCATION:
A PROFILE OF PROFESSOR ANDY HOR**

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Andy Hor joined the National University of Singapore (NUS) in 1984 and is, today, Professor of Chemistry.



1. FORMATIVE YEARS

Born in Hong Kong in 1956, Andy attended primary and secondary school in the then British colony. His Shanghai-born parents had migrated to Hong Kong in search of a decent living. Not able to afford the bus fare, his father once walked from Kowloon to New Territories, a distance of about 35 kilometres. As a child, Andy lived in a 'resettlement area' that was primarily built for refugees. When his parents finally earned enough to buy a black-and-white television, the eight-year-old Andy helped his family to start a 'home business', charging his neighbours an admission fee of HK\$0.20 (at that time, roughly equivalent to S\$0.05) if they wanted to watch the Hor family's television. He also sold homemade agar-agar for another HK\$0.10. Andy was never taught the concept of entrepreneurship. Instead, his entrepreneurial qualities grew out of a need to survive.

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Reflection 1: *What is the best way to teach entrepreneurship (if this is even possible)? What does it mean for an academic to be 'entrepreneurial'? Is it always a good thing for academics to be entrepreneurial?*

The young Andy was confident that his life would get better, only if he studied hard. He knew the value of education. It is therefore not surprising to learn that, in 1967, he continued to take the 10-kilometre bus journey to school on his own every school day, braving the riots in that year that were accompanied by exploding bombs and other dangers that civilians risked on a daily basis.

While at school, he found Chinese and mathematics lessons to be relatively easy. English and history lessons were fun but tough. In addition, Andy's mother sent him to an evening school to learn phonics, which was not part of the standard curriculum offered in his day school. This was a decision that she has been very proud of over the years. Hong Kong's approach to education at the time, as Andy recalls, focused on drilling students to memorize hard facts. Naturally, he was not aware then that there could be other ways of teaching and learning. Today, he realizes that such an approach is unsatisfactory and teachers who continue to teach in this way are really doing a disservice to education.

Reflection 2: *How has your early experience of classroom learning influenced the way you conduct your own classroom teaching today? Is there anything positive to be said about 'drilling' and 'memorization' in university education?*

Andy's eldest brother spent more time in the public playground than in school. Immediately after he completed primary school, his parents started him on an apprenticeship in air-conditioning maintenance. Andy's elder sister finished pre-university and could not wait to enter the workforce. Andy was therefore the first in his family to attend university. He was also the only member of the entire Hor clan to earn a doctoral degree. Andy's enthusiasm for education inspired his younger brother Tommy. While Andy was pursuing his undergraduate studies at Imperial College, he persuaded Tommy to join him in London, which he did by gaining admission to Queen Elizabeth College. Supporting their studies in the United Kingdom was obviously difficult for a family struggling to make ends meet. But the family's efforts were driven by a strong belief in the value of education. Upon graduation, Tommy returned to Hong Kong and obtained a M.Sc. degree from Hong Kong University. He joined City University of Hong Kong's computer centre and rose rapidly to become its Director. When Andy settled in Singapore, he convinced Tommy to

give up his lucrative job and come work in Singapore. Today, Tommy is the Director of the NUS Computer Centre.

Reflection 3: *What was the value of education to you as a young student? What was its value to your family and social circles? Was education in any way 'costly' to you?*

In 1976, Andy left Hong Kong for London where he was enrolled at Imperial College to pursue a B.Sc. degree. It was his first time out of Hong Kong and a real culture shock. He had a hard time understanding the cockney accent of some Londoners and an even harder time understanding the Scottish accent of some of his lecturers and classmates. The students at this academically elite college were extremely competitive. Most of his peers had been 'straight A' students in their former schools. Regrettably, in this 'cut-throat' environment, which Andy describes as rather 'un-British', students were generally suspicious of the ulterior motives of others and tended not to have many close friends. Looking back, he regards his undergraduate years as miserable and driven more by self-centred competition anxieties than a love of learning. In fact, he describes his educational experience at the time as 'negative learning', but acknowledges the value of learning to be resilient, independent, and aggressive in order to survive.

Reflection 4: *What do you think Andy meant exactly by 'negative learning'? What are the benefits and pitfalls of encouraging competition in the classroom? How can aspects of teaching and learning – such as assignments, classroom activities, online discussions, student presentations, etc – be designed to achieve the benefits of competition and avoid its pitfalls?*

Armed with an Honours degree from Imperial College, Andy proceeded to send out applications for doctoral studies. He was offered a place at Imperial College, the University of British Columbia, the University of Cambridge, and the University of Oxford. It was a difficult decision to make. In the end, he opted for the most expensive programme: In 1983, he commenced study for a Doctor of Philosophy degree at Oxford University. For someone of his background, getting an overseas scholarship was almost like winning the lottery. He was lucky enough, however, to be awarded an interest-free study loan from the Hong Kong-based newspaper *Sing Tao Daily*. By the fifth year of his career in NUS, he was able to pay back every cent of the loan.

Reflection 5: *Have you ever been a recipient of scholarships, bursaries, study loans, or other forms of financial assistance? If so, what was your experience of it? What*

sort of financial assistance is available to your students today? What sort of criteria are involved in selecting students for such awards? How can this system be improved? Can there be an alternative system?

On reflection, Andy sees himself as someone who – right from his childhood years – could not take anything for granted. In fact, he had to fight for every opportunity in his life. This formative experience has made such a deep impression that today he finds it difficult to understand the ‘entitlement mentality’ that he notices among some of his colleagues and, more generally, among some Singaporeans too.

Reflection 6: *Do you share Andy’s view about an ‘entitlement mentality’ among some colleagues and others in Singapore?*

Looking back, Andy considers Oxford University to have been ‘paradise’ in comparison with Imperial College. Both places had a thoroughly good mix of talented faculty and students, but Oxford enjoyed a much more relaxed atmosphere. Yet, one was able to learn just as much and just as effectively without the kind of harsh competitiveness that motivated many at Imperial. Andy found that Oxford students thrived on independent learning. They were naturally more interested in tutorials than lectures. Every week, students formally met their tutors on an individual basis to explore new topics and discuss their essays, a costly arrangement that only Oxford and Cambridge were privileged to offer. Andy became aware of a different way of teaching and learning. Oxford’s famous tutorial system left a deep and positive impression of ‘personalized’ teaching, which has inspired his own teaching practice today. In fact, he now excels at teaching small groups of students in freshmen seminars where he finds he is able to have maximum influence in shaping his students’ thinking.

Reflection 7: *What other formats and aspects of teaching and learning at NUS come closest to tutorials at Oxford and Cambridge? How valuable is this type of learning? Are there ways of achieving similar outcomes within the practical constraints that NUS faces?*

As a doctoral student, Andy worked side-by-side with final-year (or, in Oxford terminology, ‘Part II’) undergraduate students who focused full-time on their research projects. These students, the equivalent of Honours students at NUS, approached their subject in a deeply conceptual way, trained to think about the intellectual basis of practical research. Even laboratory work was explicitly rationalized from fundamental concepts and first principles. Andy felt

inadequately prepared for research, particularly as his own results-oriented and examination-focused education up to this point contrasted starkly with the Oxford approach. Looking back at his undergraduate experience at Imperial College, he describes his own research project as intensive and rigorous rather than stimulating and conceptual.

Reflection 8: *Conceptual or practical concerns: which feature more strongly in your teaching? How have you responded in your teaching to the practical learning outcomes that are often demanded of modern universities, not least by industry, policymakers, and students themselves?*

Andy's doctoral advisor provided him with timely guidance and had high expectations of his work, but he gave him a lot of freedom instead of constantly looking over his shoulder. Many of Andy's experiments during the first two years were not successful and so he could not publish anything. Thankfully, he enjoyed doing these experiments and persevered with them, optimistic that he was, at the very least, on the right track.

Reflection 9: *How much supervision did you receive as a student? How much did you need or want? How has your experience as a student influenced your own approach to supervising students today?*

An important part of Andy's Oxford experience was his service as President of the Oxford University Hong Kong Society (OUHKS). He recalls not being terribly successful at it. Specifically, against the will of his committee, he insisted on taking on too many projects and then delegated the responsibility for looking after them to his committee members, who were not ready for such responsibility.

Reflection 10: *Were you ever involved in student clubs and societies? If so, what have you learnt about the psychology of university students? How has this knowledge helped you in your teaching today?*

Andy only decided that he wanted to become a career academic in his final year as a D.Phil. student.

Reflection 11: *When did you decide on academia as a viable career option? Under what circumstances was this decision made?*

Most of his peers, especially the British students, aimed for lucrative corporate jobs in the city, including finance and banking. Andy, however, was not interested in these options and was not even looking for a job in the UK. What he felt he needed was more experience. Having grown up in Hong Kong and spent seven years in the UK, he needed to spend some time in the United States. Not only would this put him at the heart of some of the best research work being done in Chemistry at the time, but it would also expand the breadth of his experience over three continents, putting him in good stead for an academic career.

Today, Andy recognizes the profound importance of having strong foundations. Rightly or wrongly, doors tend to open for those who graduate from the 'right' places. They remain closed or are much more difficult to open for those who start out on the 'wrong' track. Hence, they must try extra hard to succeed.

Reflection 12: *Was your entry into academia smooth sailing? How did you prepare for it? Did you have the right 'foundations'? Or did you have to overcome many barriers and obstacles? Was there anyone – an advisor or mentor perhaps – who helped you to find your way into academia?*

Andy, always sympathetic to those among his students who find themselves on the wrong track, makes it a point to help them find their way.

Reflection 13: *Do you think your students regard you as a role model, mentor, or coach, where their life choices are concerned? Do you make yourself available to help them in this regard? How much and what kind of help should you be giving?*

In 1983, Andy took up a post-doctoral position at Yale University. He found many opportunities to socialize with Chemistry freshmen, including many American-born Chinese or 'ABCs' as they were often called. He gave some of them free tuition, gaining his first experience of personalized teaching. Even though he felt that first-year Chemistry in US universities was taught at a very basic level, he found the experience of teaching very satisfying. That was when he understood the meaning of 'learning through teaching'. He was offered accommodation at the International Center that featured a very international mix of students and fellows. The university had exactly what he was looking for in campus life. In such a diverse community, he quickly learnt how to deal with people who came from different backgrounds and had different ways of thinking. His postdoctoral advisor, for instance, was an aggressive and target-driven American.

Reflection 14: How 'globally-minded' or 'cosmopolitan' would you say you are as an academic? How diverse is the NUS community of faculty, students, and staff? How significant is diversity in global academic practice today? To what extent are inter-cultural knowledge and competencies crucial for a successful career as an academic today?

Andy found himself at the deep end of the research pool. The only way to survive was through hard work. The months at Yale were an exceedingly productive time during which he was able to publish five papers in leading journals.

2. EARLY YEARS AT THE NATIONAL UNIVERSITY OF SINGAPORE

While at Oxford, Andy received a promotional brochure from NUS, which invited applications for faculty positions. He applied, but heard nothing at first. Then, six months into his post-doctoral term at Yale, he received the unexpected news that he had been shortlisted for a lectureship at NUS. Invited to interviews conducted at the Singapore Embassy in Washington DC and the University of Massachusetts at Amherst, Andy was subsequently offered a position at NUS. The decision to take up the offer was not going to be easy, as he had come to really appreciate the life of a researcher at Yale. NUS, at the time, was hardly a global name and Singapore was even considered to be a Third-World country by some of his friends and labmates. After much deliberation though, the pragmatist in Andy realized that it was more realistic to take up a tenure-track position at a 'national' university than to continue at Yale and then look for a more prestigious academic position in an Ivy League university or a US\$100,000 salary from a job in the chemical or pharmaceutical industry in the US. At NUS, the path of his academic advancement seemed much clearer. He could take a step at a time, prove his worth, establish a name for himself, and look out for the next opportunity. Andy decided to make the move, joining the NUS Chemistry Department in 1984, at a relatively young age of 28. It was a pragmatic decision and, in retrospect, a right one. Enjoying academic life in Singapore decades after making this decision, Andy is convinced that NUS has given him all the support that he needed at that initial stage of his career.

Reflection 15: Before deciding to join NUS, what were your other options? What made you choose NUS? In hindsight, what disadvantages have you experienced because of this choice? What advantages have you gained, expectedly and unexpectedly, in choosing to join NUS? What general advice would you give colleagues, students, and alumni who have to choose from among different academic institutions (for work or studies)?

At that time, NUS was in large part a teaching institution. Lecturers were generally 'tenured' after six to nine years of service. Research was not emphasized and many academics did not exert themselves in that area. In this regard, Andy was fortunate to have started his career in a department that actually encouraged its junior faculty to excel not only in teaching, but also in research. Where research was concerned, Chemistry was, at the time, among the leading departments in the entire university. Its Head, Professor Ang Kok Peng, was a politician and a very senior and authoritative figure who advised Andy to start his research programme early. This was not typically something that junior faculty in other departments would have been encouraged to do.

Reflection 16: *Who was your first mentor (formal or informal) at the start of your academic career? What advice did you get? Did you get conflicting advice from others? What do you think of all this advice, looking back today? Is it important for university departments to have a formal system of mentorship for new faculty? If so, what should such a system aim to do and how should it be done?*

Other Chemistry professors that Andy looked up to included Huang Hsing Hua, then Deputy Vice Chancellor of NUS, and Koh Lip Lin, who was also a politician and had been the Dean of Science before Andy came on board. Ang, Huang, and Koh were all research-active and well ahead of their time.

In general, though, the department's research culture was rather relaxed. Facilities and equipment were not as advanced or easily available as they are today. Half the faculty were not research-active and there were few who could manage to publish about three or four papers a year. It seemed to Andy that those who published actively did so not because they felt threatened or insecure, but because they had a genuine passion for research. Salary increments were set at S\$125 per year with a rare provision for a double-increment to reward excellent research. A number of research-active faculty had modest grants that were sufficient to support a very small team of graduate students and research assistants. The real reward for doing research was, however, intrinsic. Those days, as Andy recalls, were happy ones.

Reflection 17: *What motivates you to do research? Would you do as well or even better with more external inducements? Has the pressure to produce publications helped or hindered your research?*

But that was also an environment that produced a number of high achievers and academic leaders, such as:

	<i>Subsequent Positions and Achievements</i>
Professor Ang Siau Gek	Registrar of NUS
Professor Hardy Chan	Co-Director of Singapore-MIT Alliance (SMA)
Professor Lai Yee Hing	Founding Principal of NUS High
Professor Lee Hian Kee	Recipient of NUS Outstanding Researcher Award
Professor Lee Soo Ying	Director of Research and Vice Provost of NUS; and Founding Dean of Science at the Nanyang Technological University (NTU)
Professor Xu Guo Qin	Head of Chemistry Department, NUS
Professor Miranda Yap	Executive Director of Bioprocessing Technology Institute (BTI) of Agency for Science, Technology and Research (A*STAR)

Today, the quality of research at NUS is significantly higher than in the 1980s, when the university was not really looking to be highly ranked internationally. In fact, faculty were not at that time told that they needed to compete internationally and be at the forefront of research. They were simply encouraged to produce good work. Today, there are many more categories of research funding available and applications are more rigorously assessed. Start-up money for research projects can be as high as S\$1 million. Unfortunately, as Andy laments, many faculty have become so focused on building their research teams that they have lost the motivation to teach well.

Reflection 18: *Have you ever felt that your teaching duties have become an unwelcome distraction from your research work? If so, how has this feeling affected your ability to teach well? How have you dealt with this feeling?*

When he joined the department, Andy was first assigned to teach second-year courses, but was soon after asked to teach first-year courses. Looking back, he recalls taking quite naturally to the task of teaching. He looked forward every year to engaging with a new freshmen class. It was, as he recalls, a joy and privilege to be able to influence young minds. Almost two decades later, when he won the NUS Outstanding Educator Award, the

selection committee noted his excellence in freshmen teaching. Recently, Andy received an email message from a former student who has just become his colleague. It read:

I was once your student in your basic inorganic class, 10 years ago, in the year 2000. I am glad to see you here in IMRE again, ☺. Your teaching style is indeed very memorable, very different from other lecturers, with the true and false questions, food for thoughts verses, ☺. I can still remember that you mentioned although you are the head of the department, you will still make the effort to teach all year 1 students, ☺. I am grateful for your teaching and thanks for being an excellent educator in our community.

Not long after he joined the Chemistry Department, Andy began to teach students in the Direct Honours programme, where he faced the challenge of teaching the top students in the faculty.

Reflection 19: *What was the first course that you were assigned to teach? What are the challenges of teaching first-year courses? Is it a good idea for new faculty to be assigned to teach first-year courses? What are the challenges of teaching upper-level courses? Is it a good idea for new faculty to be assigned to teach upper-level courses?*

Andy remembers the undergraduates of the Chemistry Department in the 1980s to be lively, talented, and focused on learning. He enjoyed good relationships with his students, many of whom – such as the following – went on to work in industry or in the education service.

	<i>Current Position</i>
Audi Fong	Business Development Director for Medical Specialties, 3M Healthcare
Bob Koh	Principal, Hwa Chong International
Natasha Kwan	General Manager, Microsoft's Mobile Communications
George Lam	Director, GlaxoSmithKline
Lee Lih Sin	Head of Chemistry and Staff Development, Raffles Institution
Olivia Lum	Founder, President, and CEO of Hyflux

Phang Lai Tee	Senior Assistant Director, National Heritage Board
Tan Ai Chin	Dean for Research Studies, Hwa Chong Institution
Yan Yaw Kai	Deputy Head of Natural Sciences & Science Education, National Institute of Education

Yan Yaw Kai, now a professor at the National Institute of Education (NIE), was a M.Sc. student at NUS under Andy's guidance. He recalls how

One truly appreciates the meaning of the phrase 'values are caught, not taught' when one works with Andy. His enthusiasm and seriousness in research and concern for the welfare of his students are evident right from the start, and tend to rub off on those around him. While expecting high standards of performance from his students, Andy provides a corresponding level of support to enable them to meet his expectations. More than 15 years after completing my M.Sc. under Andy's guidance, I can still count on him to provide good counsel on my development as an academic.

Reflection 20: *Do you keep track of where your students have gone after graduation? Do you maintain a relationship with your students after they have graduated?*

Over the years, there has been a noticeable change in the character of NUS students. Andy suggests that this may have been a result of the new modular curriculum structure introduced in the late 1990s and the increasingly decentralized nature of courses where larger numbers of students come together for shorter courses (or modules), some of which are of a cross-faculty nature. Honours classes have become much larger, so students may not get to know everyone in their classes as well as previous cohorts used to. This has also meant that each faculty member typically supervises the work of a larger number of Honours students. Inevitably, there is less time for individual attention. With its growing international stature, NUS has also become much more attractive to students from overseas. As Andy recalls, the first students from China started to come to NUS about six years after he arrived in Singapore. Students from the Indian subcontinent followed soon after. Over the decades, the flow of students has come to include many other nationalities.

Reflection 21: *Do you also detect a change in the character of the NUS student body over the years? If so, are things better or worse than they used to be? Have you had to adjust your teaching practice in any way?*

His department Head, who was also a parliamentarian and Singapore's first ambassador to Japan in 1968, was skilled at mobilizing people. Although Andy was new to the department, he was invited by the Head to take on some departmental responsibilities. He was sent to Brunei for a year on secondment to teach at Universiti Brunei Darussalam. It was an eye-opening experience to teach at a level that he considered rather elementary. It also provided an opportunity for him to grasp the finer points of teaching basic concepts in Chemistry. Upon his return, he was appointed convenor for second-year students, a challenge for a junior staff member without any experience in student management or counselling. When Professor Bernard Tan, then Dean of Science, set up a new Instructional Development Unit, he invited Andy to chair it. Andy accepted without hesitation. Later, he was part of a team – including Professor Tan Eng Chye (now Provost of NUS) and Professor Lim Tit Meng (now Director of the Singapore Science Centre) – that set up the Special Programme in Science (SPS) in the Faculty of Science. This programme for 'gifted' students in the Faculty of Science later became the model for the Core Curriculum and then the Talent Development Programme. When the idea for a Core Curriculum was mooted, Andy served on the Science Faculty's secretariat and, in this capacity, worked with the Core Curriculum's Director, Professor Shih Choon Fong, who later became the President of NUS. Even as a young faculty member, he was eager to accept the challenge of administrative responsibilities. For one thing, he was able to acquire and hone administrative skills that would become especially useful later in his career.

Reflection 22: *What kinds of administrative and service responsibilities are appropriate for younger faculty? What were you expected to do at the start of your career? How did you feel about being (or not being) given these responsibilities at the early stages of your career? In hindsight, would or could you have done things differently? How important is it to find administrative and service opportunities that enable one to work closely with high-achieving members of the university?*

3. RESEARCH, TEACHING, AND SERVICE AS ESSENTIAL FACETS OF PROFESSORSHIP

Andy is a staunch believer in the need to be serious about research, teaching, and service as essential components of the professorial vocation. Anyone who neglects even one of these is, in his view, an 'incomplete' professor. Andy himself works hard to excel in all three.

As a scholar and award-winning scientist, he has published hundreds of highly cited international papers on heterometallic syntheses, homogeneous catalysis, and supramolecular assembly. Frequently invited to give keynote and plenary lectures at international conferences and symposia, Andy has won a number of fellowships and held visiting professorships at many universities. He has been of service to top journals in an editorial and advisory capacity. He has also chaired many international and regional conferences and symposia.

As a teacher, Andy has to date supervised around 30 doctoral, 20 Masters, and over 100 Honours students. He has also supervised the project work of more than 150 secondary and junior college students through a variety of programmes. Over the years, he has received numerous teaching awards, including the NUS Outstanding Educator Award in 2002.

Reflection 23: *What other indicators of success in scholarship and teaching should be considered in formal assessments of faculty performance?*

Andy's stint as Head of Chemistry Department from 1999 to 2003 and again from 2005 to 2009 gave him tremendous satisfaction. He valued the opportunity to exercise academic leadership mainly because it authorized and empowered him to carry out with conviction his ideas for improving the department. He notes how it is not difficult to say what needs to be done to make things better, but gaining support for these ideas and implementing them are challenges that are best confronted by taking up formal leadership roles. As Head, for instance, he was able to hire some really talented people and obtain resources to improve departmental infrastructure. Over half of the faculty members in the Chemistry Department today were hired under his leadership.

Reflection 24: *What leadership roles have you played at NUS? What were you hoping and able to achieve as a leader? Is there much scope for making positive changes outside of the formal leadership structure at NUS, through ground initiatives for instance? Is there a need for more active citizenship and perhaps even activism among faculty, students, and staff at NUS?*

Looking back, Andy remembers that there were always some colleagues who opposed him when he led the department. There were also colleagues who always worked against the system. However, he maintained confidence in his ideas and was sufficiently transparent so that his colleagues knew that decisions were made in everyone's interest and not his own. By being reliably consistent, he gained the confidence of others. Looking back, however, Andy does not think that he was a very popular department Head. Perhaps he was too eager to make changes when he thought things were too stagnant. Perhaps he was too

much of a results-oriented disciplinarian and his manner was too abrasive. He admits to being, at the time, intolerant of mediocrity and often complained that 'people tend to talk too much and act too little'. He admires leaders like Margaret Thatcher who act on what they believe to be right, rather than what they think the people want.

Reflection 25: *What is your leadership style? Do you model yourself after any particular leaders? What adjustments need to be made when leadership models or approaches are applied in academic contexts?*

But he had also learnt from the mistakes he had made as OUHKS President many years ago, trying to temper his strong convictions with a more consultative approach that was sensitive to people's needs and that sought to understand other people's perspectives.

Reflection 26: *How should authority be expressed and exercised at NUS, given the peculiar nature of academics and students? Is collegiality possible with/without authoritarian leadership? How can academics be mobilized around organizational needs and interests without compromising their professional autonomy (or bruising their egos)?*

Now that he is older and wiser, Andy feels that he has become more cautious, even though he is more confident in himself than he ever was.

Reflection 27: *How have you changed over the years as an academic? Looking back, are you happy with this evolution? What do you think when you meet young(er) academics who may have a fresh, perhaps idealistic, or even unrealistic view of the academic profession?*

Looking back, he acknowledges that there have been occasions when he was too impulsive in making major management decisions. This came from being an instinctive person with an impatient and opportunistic nature. When he was Vice Dean (Academic) of the Faculty of Science, Andy introduced a mentorship system to address what he perceived to be a weakening of 'class spirit' among students who were not only becoming more atomized by the new modular system, but also encountering a range of administration-related problems. The students needed better advisory support and he felt that more faculty members and staff needed to be engaged to help. From his experience at Oxford University and Imperial College London, he believed that the NUS students could also benefit from personal academic tutorship. Together with the Dean, he pushed through a new mentorship system, whose basic idea had

been mooted, conceived, and implemented faculty-wide all within a month. The system is still in place today. However, Andy acknowledges its many problems. As an all-encompassing and non-discretionary programme for such a large faculty, the mentorship system was bound to lack the kind of ‘personal touch’ that it had been set up to provide. It was, therefore, self-defeating. In the impulsive drive to set up such a large programme, not enough attention had been paid to assessing alternative arrangements and working out the operational details. In hindsight, Andy would, today, set up the mentorship system on a more selective and voluntary basis, targeting a much smaller group of students who genuinely need support and recruiting a much smaller group of faculty members who are genuinely prepared to spend quality time with students.

Reflection 28: *Is there a mentorship system for students in your faculty? If not, do you think your faculty needs one? If your faculty does already have one, does it work well? What improvements could be made to the system?*

Andy is today disappointed by the way many faculty are just too narrow-minded about their academic life, thinking it is just a matter of publishing many papers and teaching some classes. They also tend to put their service responsibilities on the back burner. Today, department Heads are generally advised not to give young academics too many responsibilities. Andy rarely turned away the responsibilities offered to him. In fact, he liked to take on challenges and got a lot of satisfaction out of them. Although the material rewards for service are few, he has been rewarded with less tangible benefits. For instance, his efforts to introduce programmes that have made his department more internationally visible and competitive are appreciated particularly by a number of younger colleagues. Students also appreciate his teaching and administrative work, and are keen to join his laboratory research team. As well, service has been a kind of pressure-relief mechanism, which has helped strike a healthy balance in his academic career.

Today, NUS is a great place to develop a career in research. But he feels that NUS should also incentivize faculty to develop a fuller profile as a professor. He believes that faculty on a professorial track need to distinguish themselves from full-time researchers by finding a good balance among research, teaching, and service interests.

It is, as Andy readily admits, necessary to know one’s capacity and limits, since everyone is different. But if one can manage it, one should not immediately decline taking up responsibilities as an automatic response.

Reflection 29: *Do you tend to automatically regard invitations to take up new responsibilities as additional work that you have no time for, or as a means of exploiting your labour? Do you think of such invitations as a signal of how valuable you are to the organization and as a sign that your prospects are good?*

Part of the problem, Andy believes, is that many faculty assume straightaway that there are conflicting demands from the three facets of the professorial vocation. Andy, instead, thinks that whatever he does in one area can have a positive impact on his performance in the other two. For instance, Andy has found that his administrative responsibilities have enabled him to pick up valuable skills in people management, skills that directly help his teaching and research. As an experimental scientist, he finds ideas and inspiration not only from reading, but also from working with industry professionals, consulting for policymakers, mentoring school children, organizing conferences and workshops, and so on. This, for him, is one of the benefits of serving as President of the Singapore Institute of Chemistry. Unfortunately, he sees too many colleagues turning down such opportunities because they think they are too busy.

Reflection 30: *How much professional contact do you maintain with parties outside of the NUS community, for instance industry players, government ministries, schools, and so on? Have you found these contacts to be helpful to you in your research, teaching, and service work?*

The practice at Oxford University offers a good example of possible synergies between research and teaching. As these two areas are really quite complementary, a world-class research university does not mean first-rate research and third-rate teaching. At Oxford, both scholarship and teaching are highly valued. Oxford professors commonly discuss their latest research in tutorial sessions. Typically, students at great institutions like Oxford and Yale Universities rarely get excited about the things that they read in textbooks. Instead, they are eager to know about the latest developments in their professors' research laboratories. Naturally, professors whose teaching involves the sharing of their own research tend to attract the best graduate students and postdoctoral fellows. Thus, professors should not treat research and teaching as discrete pillars, but should try to build bridges across these pillars.

Reflection 31: *How much of your latest research have you been able to introduce into your classroom? How much of the curriculum and teaching materials that you develop have grown into research papers or projects? Have you collaborated with your students through innovative assignments to jointly publish good quality*

research? Have you done any educational research using the experiences and data obtained from classroom teaching?

By holding the professorial vocation to such high standards, Andy admits that he is ambitious, in the sense that he wants to do his best in whatever it is he chooses to do. He also thinks big and believes that talented people should do big things to prevent their talent from being untested, unused, and wasted. In his pursuit of excellence, did he have to sacrifice anything in his personal life? Andy married relatively late in life at 40 years of age. When he was a single man, he could work day and night. Social life was never a real priority for him, but he managed not to have to give up his love of playing football. He now has three daughters, whom he has named Kar Yin (嘉研, which means good research), Wai Yin (惠研, which means beneficial research), and Tzi Yin (芷研, which means plant or natural product research). Their names reflect Andy's research agenda and its contribution to modern society.

Reflection 32: *Do you feel that you have neglected important aspects of your life? What is the cost of becoming a successful professor? Is there a way of avoiding or transforming these costs? Do you belong to a peer support group, however informal, that can collectively think through these issues with you? Do you think that faculty members who are women can relate to Andy's experiences, particularly where personal, family, and social life are concerned?*

4. THE SYSTEM AND CULTURE OF NUS TODAY

Andy recognizes that the system and culture at NUS have changed profoundly since he joined in the mid-1980s when NUS was far less competitive. Today, young academics mostly join NUS on tenure-track positions and have to work hard to ensure they get, within a short (and shortening) number of years, a permanent position or else lose their jobs altogether. The dominant perception, particularly among younger faculty, has been that the system rewards research, perhaps in a smaller way teaching, but very rarely service. There is enough anecdotal evidence to show that this is not entirely untrue.

Naturally, younger faculty come under tremendous pressure and strain to succeed in gaining tenure and so they focus almost entirely on producing a high number of not necessarily impactful publications. This, Andy thinks, encourages an imbalanced, short-sighted, and quite unnatural approach to the professorial vocation. Competition, Andy believes, is healthy but only if it leads to constructive research outcomes. He believes that collective anxiety has created an exaggerated sense of the difficulty involved in surviving the NUS system. Being excellent in all three areas, Andy believes, is difficult; but finding

a balance among the three in order to survive is not. He believes that the evidence of success, if such statistics were made more widely available, would reassure younger faculty that they can adopt a more balanced approach and even enjoy what they are doing without compromising their chances of survival.

Andy notes that the problem is, to some degree, a question of perspective. When one is coming up for tenure, it seems like tenure is everything. Only after the trauma can one understand it in better perspective. While acknowledging that this experience is magnified for many younger faculty members today, for whom much more seems to be at stake in the quest for tenure, Andy admits that he also ‘went all out’ in order to secure his ‘job for life’, mistakenly thinking that with tenure one would have everything one needed. He recalls how some of his expatriate colleagues even gave up their citizenship to become Singaporeans because they thought that it would help them to be tenured. His own strategy was to focus primarily on the link between his research and teaching, in order to give himself a ‘competitive edge’ over his peers. He also took up every opportunity for management work, no matter how difficult it seemed to him. He did not pro-actively look for such opportunities, but did not decline any that were assigned to him. He reasoned that a new and rapidly developing university like NUS would present many management opportunities for people like him, who displayed a positive attitude towards management responsibilities. He was right. Although Andy managed to clear the hurdle without any upsets, he very soon realized that tenure was really the beginning of his academic career. Once he was tenured, he immediately took on more responsibilities and challenges. Students and staff expected much more from him as an educator. In pursuing his research, he had to ‘take on the world’ and achieve international recognition. In management work, his line of vision went well beyond his own office and department. In his pre-tenure years, he had not realized that this would be the case.

Reflection 33: *If you are a tenured faculty member, did you have a particular strategy for achieving tenure? What was your experience during the years leading up to tenure? How has your academic life changed after gaining tenure?*

Andy believes that NUS could do a better job of communicating the importance of balance when it hires new faculty and when they are annually reviewed.

Reflection 34: *Is ‘publish or perish’ the dominant message that you get at NUS? Have you also heard less pessimistic and more supportive messages? Have you ever*

seen statistics on tenure and promotion success rates at NUS? Would you know where to find them?

The bias towards research, Andy acknowledges, is difficult to deny. In part, this is a function of the university's need to find its place among the best universities internationally. And a world-class university is mainly judged on research excellence. And yet, NUS cannot relinquish its mandate as a comprehensive teaching university. Being a national university that depends predominantly on public money, NUS also has an obligation to the community and a responsibility to the public. The service rendered by its faculty is also an important gauge of the university's relevance and impact. Therefore, NUS seems to have multiple objectives that are, for some, difficult to reconcile in their own vocations.

Reflection 35: *How would you rank in importance the multiple objectives of NUS, based on what you have seen in practice? How would you rank these objectives, based on what you think should be the case?*

This, Andy believes, has created among some groups at NUS a negative culture, in which people have lost faith in the university and feel powerless to do anything about it. Andy, however, believes in the NUS system. He has faith in the transformative power of good leadership, arguing, for instance, that Deans and Heads should work towards empowering faculty in their teaching and research. Today, NUS has become a top global institution, able to attract high-calibre academics and researchers who show great promise. All that the university really needs to do is to provide the necessary resources for excellent teaching and research, and an environment that promotes innovation and enterprise. If NUS can do that, there would be much less need for regular assessments, reviews, and evaluations, thus immediately reducing the amount of administration and bureaucracy, and freeing up faculty time for productive teaching, research, and service. Most importantly perhaps, there would be more time for thinking.

Reflection 36: *As an academic at NUS, do you have time to 'think'? What does 'thinking' mean to you? How does 'thinking' relate to research, teaching, and service?*

Providing the resources and environment for faculty to aim high should be the university's paramount mission. For instance, NUS should provide, at university and faculty levels, more funding for research developed around curiosity-driven ideas. Compared to the past, Andy feels, there is currently very

little support for this kind of research, even though past research has, ironically, produced numerous papers that have helped to push NUS up the university rankings.

Reflection 37: *Have you been able to conduct 'curiosity-driven' research? What support have you found for this work? How does it differ from the kind of research that the university prefers to support?*

Andy's optimism about changes in the NUS culture and system that will encourage a more balanced approach to research, teaching, and service is also based on seeing new initiatives like the formation of the Teaching Academy in 2009, of which he is a fellow. Through its Teaching and Learning Club meetings, which he spearheaded with Associate Professor Kenneth Paul Tan, faculty and students from across the campus can come together and discuss a range of issues that matter to them.

Reflection 38: *Are you aware of the Teaching Academy and its Teaching and Learning Club? If you are, what is your assessment of its efforts so far? What else should it be doing?*

And through *Academic Journeys* (the Teaching Academy's series of case studies, of which this is the first), faculty have an opportunity not only to reflect critically on their careers in abstract terms but also to see concrete examples of how others have managed their careers under similar or different circumstances.

Reflection 39: *These case studies are designed mainly as stimulus for individual reflection and group discussion. From the list of reflection questions, facilitators can select those questions that are relevant to the topic of interest. What other ways can case studies like these be used?*

5. CONCLUSION

On reflection, Andy describes himself as osmotic, absorbing many influences from working in institutions around the world. Today, he regards his career as 'balanced' by such influences on his scholarship, teaching, and service. For instance, he detects some American aggressiveness and drive and also the survival instinct characteristic of people from Hong Kong in the way he pursues his research agenda and secures research funding and opportunities. When it comes to his teaching, he detects a more genteel approach, excelling in high-quality interactions with small groups of students, an influence no doubt from his years at Oxford. When it comes to administrative duties and service to the

wider society, he detects a Singaporean side to his character. In Singapore, a small place with few universities, the links between academia, community, industry, and policymakers are many and strong. Many academics here understand the importance of serving and making an impact beyond the ivory tower, though not everyone acts upon it.

Reflection 40: *Would you describe yourself as 'open' or 'osmotic'? What are the main influences on your research, teaching, and service practices? Which of these would you regard as 'good' and which as 'bad'?*

In May 2010, Andy received an out-of-the-blue invitation from the Agency for Science, Technology and Research (A*STAR) to head its Institute of Materials Research and Engineering (IMRE). True to form and almost without hesitation, Andy accepted this challenge of a full-time job managing a major research institute. To Andy, the decision was a natural step in the progress of his academic life, an ideal opportunity, as he describes it, 'to put in practice my faith in the synergies among education, research, and management'.

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