

This issue of CDTL Brief is the second of a two-part Brief that features the teaching practices of the 2005/2006 Annual Teaching Excellence Award (ATEA) winners.

Teaching the Weightier Matters of the Law

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Woe to you, scribes and Pharisees, hypocrites! For you tithe mint and dill and cumin, and have neglected the weightier matters of the law: justice and mercy and faithfulness. These you ought to have done, without neglecting the others. (Matthew 23:23, English Standard Version)

I borrow the preceding quotation out of context, where Jesus chided the scribes or teachers of religious law for rigidly adhering to lesser provisions of the law by returning to God a tenth of even the most trifling produce of their land, whilst ignoring the more important commandments of justice, mercy and faithfulness. As a teacher of legal philosophy who challenges my students to think about law's connection (or lack thereof) with justice, morality, truth and the like, I have always liked the reference to the "weightier matters of the law" in the quotation, because that is what I think I am promoting an awareness of, even though the law, as most know it, cannot be neglected.

I teach a compulsory first year module, LC1002B "Introduction to Legal Theory (B)" and an upper year elective, LL4404 "Jurisprudence". In both courses, I get students to examine fundamental questions about the enterprise of law: its nature, purpose and function, its legitimacy, how it interacts with other social phenomena such as

morality and politics, and the potential that law has to transform society by influencing morals or changing existing power relations.

As philosophical readings are generally tougher or more abstract than cases and statutes, and as the average Singaporean preparing to practise law may not have as much an incentive to put her heart into this subject when she does not see its immediate relevance to her job in future, much is needed to spark students' interest. I try, particularly in my first year course when students know too little law to appreciate broad sweep descriptions of the law by legal philosophers, to engage students through the discussion of some of the most polarising issues in today's world—laws relating to the practice of abortion and to homosexuality.

While every good philosopher has an awareness of her personal worldview, my mission is not to impart my own worldview, but to challenge students to formulate theirs, usually by employing the Socratic techniques of the dialectic and the elenchus. I hear what my students have to say on a particular subject, and put to them further questions to elicit what turns out to be an elaboration of the same subject. I then challenge my students about any possible contradiction of the first opinion evinced by their responses to my further questions, and in so doing help them assess their commitment

to their first judgment, or reformulate it where necessary. The most interesting discussions have revolved around the issue of whether laws must be just before we can call them laws, and whether controversial moral viewpoints may be enforced by law.

I have discovered that one of the most important things to bear in mind for a teacher of a course in which people hold many differing viewpoints, is to ensure that those who perceive themselves as dissenting, whether from the majority of the class or the teacher, would be comfortable enough to speak up. I learnt this through a fairly hard way when I personally found it hard to express a view that was against the liberal orthodoxy at Harvard where I studied. In conducting my own classes, I try to provide a congenial environment in which the student feels valued even as her viewpoints are challenged.

Harvard law professor Roberto Unger, whose works we study in “Jurisprudence”, ended one of his earlier books with the following:

Within its province, philosophy is sovereign. But this province is limited, and the experience of running up against its limits is indispensable to our knowledge of it. When one thinks philosophical problems through, one comes at last to the outer frontiers, politics and religion, at which the philosopher’s pride is cast down, and other kinds of striving come to the fore. When philosophy has gained the truth of which it is capable, it passes into politics and prayers—politics through which the world is changed, and prayer through which men ask God to complete the change of the world by carrying them into His presence and giving them what, left to themselves, they would always lack. (Unger, 1976, p. 294)

In the end, in the face of challenges, I remind myself why I teach the subjects I teach. I want students to

engage not just their minds, but their hearts, and to come up with their own theory about the legal process, and decide what role they will play in it in future. Philosophical musings are only the baby steps; I do not want students to stop with them. Philosophical conclusions must translate into politics and religion in the figurative senses of these words—politics in the sense of practical changes in the world in which my students will work, and religion in the sense of their personal worldviews which impact the conduct of their lives. Awakened to the weightier matters of the law—justice, mercy and faithfulness—my hope is that my courses play a part in the moral transformation and development of professional identity of my students. As I believe that every student can be awakened, I teach as if every student can be interested.

Happily, I have had students reporting to me that they suffered from withdrawal symptoms when my courses were over. A few found themselves debating about whether law was necessarily connected with morality till 3 am on their holiday trip to Tioman after their examination. Another recently emailed me to share about how particular episodes of “Star Trek” made her think of some issues we discussed in class. Yet others have told me of how they smile knowingly to each other when something in other courses reminds them of particular legal philosophers.

I would like to believe, and as a teacher I must teach with the hope, that years down the road, both whilst in professional practice as well as when all the companies regulations and rules of evidence (no offense to my colleagues!) are forgotten, the *weightier matters* will remain close to my students’ hearts and will be a light unto their path.

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Plus est en vous*

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I did not know I had a teaching philosophy until one student took the trouble to spell it out for me. This happened in my very first year as a university lecturer, when I was a freshly-baked linguist aged 21 and just beginning to fathom the immense consequences that the 6-month-old political revolution in my country was carrying.

I announced to my first class on my first teaching day something to the effect that my purpose in life was to impart to all and sundry my own fascination with linguistics. One particular student stood out from the very beginning, and throughout the three terms of that academic year, facing me with comments and a general attitude in class that I perceived as hostility towards me and the fulfilment of my stated goal. He was a school teacher several years my senior, whose entitlement to further education had fallen within the first batch of legislation issued by the newly instated educational authorities, intent on raising educational standards across professionals and across the country. On the last teaching day after I dismissed class, the student came to me wearing his usual displeased frown. “I just want to tell you” he said, “that I still hate linguistics.” And he added: “But taking this subject has taught me to think.” He then walked away without waiting for a response from me.

The full implications of what this student said to me that day took their time to sink in, but they have been with me ever since. He made me realise two things. One, that knowing *about* is secondary to knowing *how to*, so that useful teaching should conform to this hierarchy. And the other, that students can be made to think—and to make their teachers think—something that was unheard-of within the deposed parroting-will-grant-you-high-grades schooling system by which I (and he) had been shaped since childhood.

Throughout my teaching life, these two realisations have fused into one overarching guideline: teaching means activating resources that are there, which in turn means that students must engage with what *they* have, not with what *I* can supply to them. I now discuss how these realisations have influenced the way I teach.

Every act of conscious learning requires the willingness to suffer an injury to one’s self-esteem. That is why young children, before they are aware of their own self-importance learn so easily; and why older persons, especially if vain or important, cannot learn at all. Thomas Szasz (1920–)

The theory—*how do we know?*

Socrates is credited with saying that he only knew that he knew nothing. Will Durant (1885–1981) later added to this insight by stating that “education is a progressive discovery of our own ignorance”. I agree with both.

The question, ‘How do we know?’ pervades my teaching. As stated, *how* matters rank above *what* matters in my pedagogy on my realisation that knowledge is measured by qualitative criteria, not quantitative. Regardless of ‘how much’ some people may know, if the sources of their knowledge are questionable, so is the knowledge itself. Questionable sources are besides what perpetuates myths, not least myths about language, languages and their users.

What do we know and *how do we know* symbolise for me the crucial difference between accessing *information* and accessing *knowledge*. I therefore see it as my obligation to make it clear to students

* ‘There is more in you than you think’—founder of the United World Colleges, Kurt Hahn’s motto.

that they should question the sources of all their knowledge. This includes questioning me and the sources that I may provide for their learning. I actively protect my students against myself and my own ideas. The reason is that I do not believe in cloning, intellectual cloning included.

The goal—*unsettle*

All learning should be unsettling. If we always know exactly what to do with our learning and what to expect from it, we are either boring or bored (or both).

I start by introducing accepted ways, theories and models of dealing with language issues. Depending on the module, the stated goal may be that students understand what makes up language, just like a biologist understands what makes up a living organism or a geologist understands what makes up the structure of the earth, or what we know about language ontogeny and why that matters.

I then deliberately face students with questions and puzzles which lack answers, or agreement among available answers. I decided to write a textbook for my linguistics exposure module (EL1101E “The Nature of Language”) precisely to implement this goal—the authors of available introductory linguistics textbooks brainwash readers from page one with their pet theories and methods, with no word about alternatives.

I also require that students actively look for counterevidence to accepted ways of solving language puzzles. That is, students, particularly youths, are required to do what they can do best, which is to challenge authority through informed ways of doing so. This includes offering counterevidence to principles or data introduced in class, so that I can be unsettled in turn and therefore learn. One instance of student-to-teacher feedback of this kind resulted in my founding, in 2005, of a Special Interest Group dedicated to Singapore child language (SCLSIG), which has now expanded its membership to include NUS students as well as

child language experts in Asia, Europe, the US and Australia.

The method—*get involved*

We do not learn by listening to lecturers, revising lessons or mugging for tests and exams. We learn by doing.

This is why all my teaching involves fieldwork, where students are required to gather and analyse real life data on their own. I favour materials with which students can easily identify, be it clips from local newspapers or uses of language found in Singapore.

This choice makes a point of letting students experience first-hand the pleasure of discovery, whether their findings confirm or disconfirm what they already knew or what the available literature has to offer. Two overarching goals pervade this teaching method: respect for data and respect for intellectual honesty. Both goals mean that every single student is made to contribute to everyone else’s learning. I do not identify extraordinary students as benchmarks or leaders of whatever outcomes I propose to attain, nor do I endorse as extraordinary any students who may have been pointed out to me as such. I make all students aware that anyone can do extraordinary things instead. To achieve this goal, I find invaluable support in the IVLE facilities, which allow constant, lively and informal interaction among students and me. My email address is another ‘hotline’ for students to channel their queries or book consultations.

Fieldwork is the major assessment component in my modules. Assessment, not learning, is the often unstated primary goal of the teaching-learning contract, where learning is often synonymous with rote learning. Since I believe that people only need to memorise what makes no sense to them, all assessment is open-book where students have access to any printed material (NUS directives bar access to electronic material, which I would

willingly allow). This means that my focus for traditional assessment pieces like tests and exams, is on individual application of gathered knowledge to novel material and tasks, because I assess thinking and analytical skills, not the perfect reproductions of which certain machines are capable.

In Semester 2 Academic Year 2005/2006, I was able to implement full CA assessment for one of my modules (EL3207 “Child Language”). Regrettably, the continued enforcement of final examinations for other modules is beyond my control, although I have managed to have their weightage in final grades reduced to the minimum 30%. My reasons to reject/minimise the weight of final examinations for assessment purposes are that a couple of hours at the end of term contribute nothing to (a) gauge students’ intellectual engagement and academic development throughout term and (b) students’ learning.

The practice—*think big, work small*

The cornerstone of solid learning is to realise that everyone needs to take small steps before they can run. In my experience, freshmen and PhD students alike become firm believers in two

things as soon as they familiarise themselves with basic information on their topics. One, that they will solve to everyone’s satisfaction any age-old problematic issues in those topics. And the other, that the hallmark of credible intellectual work lies in the use of massive obscure jargon.

I therefore spend a lot of time in class and in private consultations making it clear that anyone’s proposal about a problem, beginner or expert, is *one* solution among others, and that any finding worthy of the name is there to be *communicated*. If we cannot explain what we are doing in straightforward language, then we do not know what we are doing.

I also spend time making it clear that any intellectual work worthy of the name must have a purpose that goes beyond itself. If one’s research contributes nothing to an extant body of knowledge, then it is not worth pursuing.

Lastly, I keep in mind and in my students’ minds a quote by Oscar Wilde (1854–1900): “Nothing that is worth knowing can be taught”. Teaching is showing the way to what the *learner* may find worth knowing. ■

Joining the Dots

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Being recognised for my teaching at NUS in the form of the Annual Teaching Excellence Award was exciting news for me. However, my sense of pride was soon replaced by a mood of reflection as I looked back to 25 years ago when I first became a university undergraduate. A quarter of a century has flown by! I began thinking about the university professors who had taught and inspired me. There were many professors in my department; some were aloof and intimidating, some had limited time for their students and others were great in their research but made lousy lecturers. The ones who inspired me (even to this day) were those who nurtured my quest for knowledge and gave their time to me freely.

As a young, ambitious undergraduate with a raging thirst for my subject, I was keen to impress when I first arrived as a cocky teenager at the university. After all, I was there for a reason—I had chosen my subject (ecology and environmental science) with certainty and I knew I would like to pursue a career in this field. The transition from high school to university was not as smooth as I expected though. It was my first time away from home with new surroundings, new friends, new classes and so on. I felt the culture shock acutely and I was surrounded by professors who had almost god-like status in their reputation. When I received a low grade for my first assignment, I remembered it felt like a slap on the face! I had made the mistake of giving a textbook answer to the question with little thought or research. Although my initial tendency was to blame my poor grade on the excesses at the freshman's ball the night before the assignment was due, it was still a humbling experience and a reality check for me. I realised that giving straight answers to questions will not get me decent grades; I had to be creative, original, organised, structured and precise in my answers.

Looking back, my university experience was like learning to drive a car. Initially I got stuck in first gear as I jerked the accelerator and fumbled for the clutch. Slowly as I became more confident, I learnt to multi-task—changing gears smoothly, looking out for dangers and accelerating ahead. After my initial setback, I started to get the hang of writing assignments. I soon learnt how to do my research well, how to give precise and creative answers, how to show independence of thought in my answers and let my passion shine through, giving the professor a little more than he expected. In the midst of all the knowledge I was absorbing through countless lectures, tutorials, laboratory classes and assignments, I recalled having what I can only call 'eureka' moments—brief periods of revelation when I could suddenly see all the complex interconnections in my subject. By the second and third year at university, my mind felt more like a Ferrari engine and there was nothing that could stop me from learning, achieving and becoming a master of the road! Looking back now, the professors who had helped me achieve this, and who still resonate with me today, were the few who imparted knowledge with genuine passion and without reservation. They willingly gave their time to me, encouraged me and nurtured my passion for the subject, and put themselves on the same level as me. They were my 'driving instructors' who forgave my 'faults' and guided me towards my goal.

During my teaching career at NUS, I draw plenty of inspiration from my favourite professors of yesteryear. I make myself freely available to students and always try to break down the barrier of 'them-and-us' that so often exists between teaching staff and students. I believe that a student will strive to perform better when he or she knows that their professor is an ally. On the technical side,

I strive to use real life examples of projects in the classroom. I am fortunate to have spent a few years in the private sector as an environmental scientist for an international consultancy company. I strive to make remote and abstract concepts relevant to the working world which students will enter upon graduation. My lectures are enhanced with animation and videos wherever possible, and I make use of the wonderful materials available at the NUS libraries. I also provide all my lecture notes and supporting information online via the university's excellent Integrated Virtual Learning Environment (IVLE) in advance of classes, but I provide only the basic information. I stress to my students that full class attendance together with reading of additional recommended materials is necessary if they want to add on to the lecture notes. Thus, lecture notes are provided in a format that encourages students to take additional notes in class. I also strive to use contemporary textbooks that include CD-ROM and online learning materials.

I have also organised career seminars for final year undergraduates by inviting working professionals to talk to students about possible career paths, and I enjoy taking students on field excursions for an 'out of the classroom' teaching experience. I always find it surprising that many environment

students from Singapore have not visited their own natural treasures—Bukit Timah, Sungei Buloh and Chek Jawa! I also teach a cross-faculty module GEK1522, "Global Environmental Issues" where I often use thought provoking material to create an impact and draw students' attention to the topic. Such techniques help students understand better and facilitate in-depth learning. As an ecologist and environmental engineer who is fascinated with the workings of natural ecosystems and greatly concerned about the accelerating pace of climate change, I try to inspire students from all disciplines and make the subject relevant to them.

I am a firm believer in what William Butler Yates (1865–1939) said: "Education is not about filling a bucket, but lighting a fire." The most rewarding part of teaching for me comes through student evaluation feedback. Off-beat comments such as the following are always amusing: "He must have been better looking when he was a lot younger". Other comments like "He should buy himself a new laptop and join the 21st century", are nicely counterbalanced by those along the lines of "Dr Obbard is like one of us. He helped me to join the dots, now I understand." This makes it worthwhile and makes me think of my own favourite professors many years ago. ■

Teaching: A Learning Process for Both the Teacher and Student Alike

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I have been blessed with the special opportunity to shape the knowledge and minds of aspiring doctors. Teaching, to me, involves imparting knowledge to students and developing their skills through a process of training, education as well as learning by example. Central to this process is stimulating and sustaining students' interest in the subject and developing their passion for it. To accomplish this, a teacher needs to have the ability to understand students and bring the subject to a level that they can understand and digest.

My teaching style and approach have been shaped very much by my past experiences as a student, a teacher as well as a doctor. I have been taught by many different teachers with as many different styles and approaches. Some were brilliant; they expounded the minutest of details on the topic but lost the students even before the lecture started. Then there were also teachers who simply rattled off facts in a raw manner, neither attempting to make the lesson interesting nor relevant.

Teaching in a medical school is certainly different from that of a regular school. Our medical and dental students are expected to be mature and be able to learn independently and responsibly. Many come from an education system where facts and lecture notes are memorised and simply reproduced in exams. Thus, it is particularly important for teachers to help students understand that learning in medical school is much more than just memorising facts and then regurgitating them in exams. It involves understanding and applying the knowledge to new scenarios and questions which I believe is crucial in a field like medicine. Students should have a love for the subject, the desire to apply his/her knowledge and develop an inquiring mind in order to cultivate new areas of research and study.

I feel a great sense of satisfaction when I see my students enjoying the learning process, forming their own approaches towards clinical problems and applying their knowledge to solve these. However, students need to have a certain level of maturity to understand the essence of this learning process and not focus solely on the examination grades. The teacher also needs to adapt to changing needs and demands, and make necessary modifications in his/her teaching approach. No two students are alike and certainly no two cohorts are similar. Hence the teacher has to have a feel of students' strengths and weaknesses as well as their learning styles in order to bring out the best in them. This is the challenge in teaching each new batch of students, but also the most exciting part. Hence, students do shape the

teacher's approach and style, and we can learn how to teach better if we take the trouble to listen and understand students better.

As a doctor, I have also been very fortunate and blessed to be given opportunities to learn from the patients I see everyday. Every patient has a different story (i.e. clinical scenario or history) even if the diagnosis may be the same. Learning from my patients has helped shape my thinking and my clinical practice. Seeing critically ill children as well as families who have to face and cope with the tragic loss of a child has changed my views of life. My patients have also taught me patience and communication skills and that every patient needs (and deserves) care and concern as well as information that is due to them. Through it all, I have learnt to express my thoughts and convey the relevant bits to the patients and their families (especially since I am a paediatrician), not just to clarify their understanding but also to address their fears, concerns and queries. Meeting and dealing with children everyday has enabled me to relate to children in the ward as my own. It can be said that while the doctor teaches the patients the right things to do to achieve good health, treat diseases and prevent illnesses (where possible), the patients teach the doctor much more about life, loss, pain, suffering and communication. I thank my patients for the lessons they have taught me and I hope to continue to be a good student of life so that I can be a better teacher and mentor to the next generation of doctors and doctor-teachers alike. ■

My Contributions to the International Mission for Pharmacy Education

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Within the healthcare team, the pharmacist is a professional charged with the responsibility of ensuring the safe and appropriate use of medicines so as to achieve the desired health outcomes for patients. In the pharmaceutical industry, pharmacists may be involved in clinical research, product development, manufacturing, regulation, sale and marketing of pharmaceuticals. Therefore, the education of pharmacists will have to provide its graduates with a unique body of knowledge and a set of skills that will enable them to handle a wide range of challenges with competence.

The Fédération Internationale Pharmaceutique (FIP) is an organisation that represents and serves the professional interests of pharmacists and pharmaceutical scientists worldwide. In the “FIP Statement of Policy on Good Pharmacy Education Practice”, the organisation has recommended that a basic pharmacy education should “provide pharmacy students and graduates with a sound and balanced grounding in the natural, pharmaceutical and healthcare sciences that provide the essential foundation for pharmacy practice in a multi-professional healthcare delivery environment” (pp. 2–3). In a report of a World Health Organization (WHO) consultative group on the role of the pharmacist, the group has identified qualities of “seven star pharmacist” (p. 3) as the minimum essential expectations of pharmacists by healthcare systems worldwide. The “seven star pharmacist” is expected to be a caregiver, communicator, decision maker, leader, lifelong learner, manager and teacher. These characteristics are recognised as the key outcomes of the basic professional education and training of pharmacists.

These two organisations have set the essential outcomes for the education and training of future pharmacists. Pharmacy education offered by the Department of Pharmacy at NUS is indeed attuned to the recommendations of FIP and WHO. In addition, the department’s mission is to provide a broad-based pharmacy education to enable its graduates to pursue professional careers in a spectrum of work environments, including hospitals, community pharmacies, polyclinics, the pharmaceutical industry, regulatory agencies and so on.

Therefore the professional curriculum at NUS Pharmacy has been carefully designed in support of the three pillars of pharmacy, namely the drug, the product and the patient. With expertise and a research interest in medicinal chemistry, my contributions to the education of future pharmacists lie in laying the foundation for the drug pillar in students’ learning process. In addition, I feel that it is also my duty and responsibility to ensure that the international and national educational outcomes for pharmacy education are achieved. In line with WHO’s and FIP’s recommendations for pharmacy education, I have decided to incorporate three main approaches to enhance student’s learning process to achieve three distinct learning outcomes.

An integrated learning experience

For the modules I teach, I provide a unique learning platform for my students to enable them to master a multidisciplinary curriculum that includes basic

sciences, pharmaceutical sciences and health sciences. I firmly believe that the pharmacists are the drug experts who are best equipped with essential knowledge in pharmaceutical chemistry within the healthcare team. This special knowledge will enable them to provide information on the properties of drugs. Therefore, in my teaching, I aim to integrate pharmaceutical chemistry into various aspects of pharmacy practice and highlight to students the chemical basis of the action and properties of drugs.

Development of useful life skills

Besides core scientific knowledge, it is important for students to develop skills in communication, critical thinking and problem-solving that are essential for lifelong learning. I aim at empowering my students to acquire these generic skills that will enable them to construct knowledge on their own and develop the habit of lifelong learning. These skills will be useful for students when they enter the profession upon graduation. In line with this objective, I set projects that require students to explore, collate, analyse and present information related to a specific topic in groups. I provide regular guidance to facilitate the learning process and make sure that the content of students' work is relevant to the projects.

Inculcating a sense of responsibility, compassion and professionalism

In order to mould students into respectable healthcare professionals, students must possess the

right attitudes and sound values. As a pharmacist, I aim to inculcate in students a sense of responsibility, compassion and professionalism through my interaction with them. In addition, I strive to lead by being a role model for my students. Winning the Professor Lucy Wan Outstanding Pharmacist Award in 1999 is testimony to my leadership in the profession in Singapore. Recently, a pharmacy journal published a feature article on me based on my "growing involvement in the global pharmacy community and for actively pursuing an improved vision of pharmacy" (Anderson & Lesko, 2006 p. 31). Therefore, a holistic development of students' intellectual and emotional being is the essence of my teaching goals.

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The First Few Moments

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It is often said that the first impression is the most important in forming an opinion of a person. In some ways, this is similar to how the early moments of a lecture can mould students' interest and dictate its overall success. With regards to teaching life sciences, the underlying objective is obviously not merely downloading information to the recipients but rather, to inspire students to learn independently on their own beyond their brief encounters with us. Thus, the challenge is to figure out how to generate sufficient interest in students to fuel their passion for sustainable self-directed learning in the early formative moments of a lecture.

Through a number of unfruitful attempts in importing teaching styles which I have acquired abroad, I was rudely awakened by the fact that learning styles are highly dependent on the cultural context. By this I mean how an individual learns is shaped largely by one's learning environment rather than one's innate intelligence. By understanding the cultural context, it is possible to incite students' passion in a subject like the life sciences which require the acquisition of mammoth amount of information and turning it into useful knowledge later on.

Let us start by asking the question: "What makes a good lecture or seminar"? The answer often lies in how the presentation is conducted and how the speaker relates to the audience. If a lecturer starts in a mundane fashion or seems unprepared, it will take sometime to build up a momentum sufficient to capture the audience's attention. Thus, with restricted amount of contact time, the lecturer may not be able to develop the required momentum. Had the same lecturer started by engaging the audience in an interactive fashion using suitable presentation styles and ending with poignant issues for further ruminations, there is a good chance that the lecture will go well. I will illustrate this by using some examples from my lectures.

In both undergraduate and graduate studies, the common challenge is to find ways to encourage students to learn to discuss, search for information and conceptualise ideas in biology. The first few moments of a lecture can serve to capture students' attention and thereafter, moulding their minds becomes easier. To set the stage, I usually start with a simple practical demonstration where I will be the centre of attention. This can be intimidating initially. The key is to be mentally prepared before the class begins regardless of its size or level. One thing I never do is to dismiss the importance of being mentally prepared even if I had delivered the same material umpteen times.

In an undergraduate class of more than 300, the practical demonstration illustrates how a genetic material called deoxyribonucleic acid (DNA) can be easily isolated from a solution. Students are often fascinated as they have heard about DNA in high-schools but yet have little knowledge of what a piece of dried form of DNA feels like or how DNA can be spooled from a solution. This demonstration serves another purpose—to bridge the communication gap between students and me. I will ask students to offer explanations on their observations of how DNA precipitates. As with most Asians, NUS students are often reserved and do not interact well with the lecturer.

I then draw students out of their cocoon by selecting students to attempt the question. This is not an easy task especially with our first year undergraduates (freshmen) who are usually unaccustomed to interaction in a large class for fear of being belittled by fellow students. It is our duty as lecturers to dispel such fears that will invariably impede students' self-confidence—a prerequisite for self-directed learning. Frequently, students provide wrong explanations. These can serve as opportunities for interaction and allow me to hit home the message that we are here to learn and

it is permissible to make mistakes. Communicating to students that it is alright to make mistakes has a profound effect on some students and can be the start of bridging the gap between them and us. It is important not to belittle those who have provided the wrong answers and to distinctively compliment those who have given the correct answers. On occasions, I will pose questions which do not have clear-cut answers. These questions inevitably draw students to offer possible explanations and allow students to learn how hypotheses can be formulated and how experiments are designed to test the hypotheses. These early interactive formative periods thus lay down the 'rules of engagement' and erode the barrier between the 'almighty-know-it-all' professor and students. Very soon, students will know that lectures are not a unidirectional didactic delivery of information but sessions that endorse bantering and the active exchange of ideas.

In our attempts to demystify and de-convolute complex concepts in biology, some thoughts should be given to presentation styles. Firstly, presentations must be sufficiently engaging and interesting so that students will be inspired to find out more by themselves. Most of my presentations include virtual animations to illustrate the 3-dimensional aspect of the molecules under discussion. I also use physical objects to illustrate the concepts when students have difficulties visualising the animations. An example is the illustration of the planar nature of peptide bonds and steric hindrance of large bulky side groups. Here, two sheets of cardboards are used to show that there is a defined angle that the two planes can rotate, hence restricting the angle of the bonds.

By establishing an interactive atmosphere early on in the lecture, we set the stage for students to discover the fascinating world of life sciences through self-exploration. ■



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