CDTLink

NUS National University of Singapore

NURTURING STUDENT CENTRICITY IN NUS

As Vice-Provost (Student Life), Professor Tan Tai Yong is passionate about and fully committed towards ensuring that students enjoy a holistic education and multi-faceted campus life where they can "find full opportunities to enlarge and enrich their learning experiences in NUS"[1]. In this special feature, Professor Tan shares his thoughts on student centricity and how the NUS community can build such a learning environment.

On student centricity

Student centricity, as the phrase suggests, means placing the student at the centre of what we do and stand for as a university. Student centricity sees the student as a valued member of the academic community, and refers to the fundamental obligation, indeed duty, on the part of the university to give full opportunities for its students to realise their goals, aspirations and potential. It is also the belief that, ultimately, the university's success and standing is measured not only by its research achievements, but, just as importantly, by the difference it makes to the lives of its students.

Student centricity entails two interrelated parts:

• The ability to provide high quality education that is characterised by flexibility, experiential learning and an emphasis on transferable skills and attributes. Student centric learning refers to a way of teaching that treats the student as an

inside

active learner, who takes ownership of his/her learning process and outcomes. There should be no tension between the commitment to quality education and the research ambitions of the university, as students should be able to benefit from the rich research that is undertaken in the university, where they can grow in a culture of inquiry and scholarship.

- The above should be undergirded by the ability to provide a stimulating, enjoyable and fulfilling experience that would enable students' holistic development in the university. This would include a student-friendly and learning enabling environment, as well as administrative structures and processes that are effective, efficient and primarily oriented towards students' interests rather than bureaucratic convenience.

Characteristics of a student-centric university

In my opinion, a student-centric university should possess the following characteristics:

- It demonstrates an unremitting commitment to creating a learning environment that engages and challenges its students, in the process providing them with the skills, intellectual attributes and wisdom to do well in life.

- It should have scholars and researchers whose passion for research is matched only by their desire to instil the drive for knowledge, discovery and intellectual growth in the young and eager minds under their guidance.

- There should be physical and social environments within the university that encourage deeper engagement of students with their campus. This would include vibrant and accessible arts and cultural centres, adequate and well equipped sports facilities, social spaces for interactions and informal learning, quiet spaces for self-study and reflection, lively residential halls and colleges, and simply places for students to do the things that students do.

- An administrative structure that facilitates more than it regulates, ever mindful that due consideration be given to decisions, as they invariably have impact on students.

- A governance structure that enables students to have their voices heard, and their concerns addressed.

Key ingredients required

First, the university must have the necessary mindset and belief system. It must believe in student centricity, that it is the students who constitute the heart of the university. I believe NUS is deeply committed in this regard.

Once that commitment is in place, we need teacher-scholars who regard teaching and learning as a noble labour of love and not a distracting chore that all too often gets in the way of research. Having faculty and staff who are able to instill the passion, joy and enthusiasm for discovery and research, would be crucial to this enterprise.

We must also have an involved and engaged student community. Student should participate in decision making and have the opportunity to influence, to a workable extent, the academic as well as administrative goals and processes that have an impact on their lives in the university.

I add a major caveat here: students must realise that with that privilege to influence comes responsibility. They must realise that it is neither always necessary nor constructive to take up adversarial positions, but should always strive to work together with the larger community to make the campus a thriving place of learning and discovery. Through this, they will learn that they need to become good citizens before they become good leaders, and that leadership means serving the larger good, where compromises and a "give and take" approach are often necessary.

What the NUS community can do to enhance student centricity

As mentioned earlier, colleagues must believe in and be committed to student centricity. Their perception of their roles and functions as faculty members is fundamental. They should see students as an integral part of the learning community, and build a relationship that is based on mutual respect. They should treat students as individuals, each with goals, aspirations, needs and talents, and then create the means and opportunities, through the

A Student-centric Approach to Learning

Outstanding Educator Award (2010) Winner Narayanan Ganapathy

Outstanding Educator Award (2010) winner Assoc Prof Narayanan Ganapathy, from the Department of Sociology, shares his thoughts on what a student-centric approach to teaching and learning involves.

To me, a student-centric approach must trigger a process of self-reflexivity, for it requires the student to develop a critical appreciation of his or her own world-view vis-à-vis the phenomenon under investigation. This is essential for it helps students draw the connection between public and private issues, and allows them to make the "experiential link" between their own biography, historical context and structural circumstances. Self-reflexivity compels students to confront their personal histories and experiences, often leading them to question assumptions about the social world they had taken for granted, while embodying the qualities of scholarship—that of intellectual curiosity, critical reflexivity and empathy.

Self-reflexivity thus has the capacity of transforming the students' personal and intellectual selves as they attain conceptual and analytical skills that allow them to "make sense" of society in the context of lived experiences. It creates the space for them to understand and appreciate how social actions are a product of the interaction between the self and social institutions. The need to produce contextualised knowledge thus makes them think critically about both the conceptual and empirical real-life issues, and appreciate how each is interlocked with the other. However, it requires more than a pedagogical tool to arrive at a particular research conclusion or to develop some general theory. While this is the intended and professed aim of academia, contextualisation, above all, is an intellectual process where abstract theories and concepts come alive within "everyday" and "ordinary" settings so that their efficacy is empirically validated and appreciated. This is where the production of empathetic knowledge underscored by a student-centric approach begins. This is also where students learn to transcend their personal limitations—whether these are stereotypical opinions, prejudices, ethnocentrism or plain indifference—and learn to engage the phenomenon as enthusiastic yet dispassionate researchers.

With the recognition that theoretical and conceptual work needs to be effectively contextualised and grounded in empirical as well as historical facts, it is important that students acquaint themselves with the body of conceptual knowledge, which is akin to carrying a "toolbox" of ideas and concepts. They could then rely on this "toolbox" to make intellectual sense of the diversities of human and social life. The reverse pedagogy equally holds—that students, when confronted with the complexities of these empirical realities, could also turn to the "toolbox" to see which theory or concept might best explain the phenomena, and if necessary, rework and restate them. This is what essentially a student-centric approach to learning should entail, which is an effective way to train critical and independent minds. ∎

In this new section, where CDTLink highlights teaching and learning initiatives around NUS which promotes student centricity, we feature two recent projects from the Dept of Architecture and the Communications and New Media Programme.

SPAN THE CAMEL: AN EXPERIENCE IN STUDENT-CENTRIC LEARNING

In Semester 2 of AY2009/2010, first year students from the Department of Architecture participated in the project "Span the Camel". We caught up with the lecturer in charge, Mr Cheah Kok Ming, who told us more about the project and the pedagogical aims they hoped to achieve.

Tell us more about this student project. What did they have to do?

"Span the Camel" was an 8-week long "learning by building" project for first year students taking the module AR1326 "Architectural Construction I". The module enables students to understand the fundamental principles of construction and to grasp the concepts of envelope and structure. This project involved group work, requiring groups of 4 students to create a 1.5-metre spanning element with a load-bearing capacity which is equal to 6 litres of water, hence the project's name. The assignment also specified that the "camel" be made of a weak material and timber such that its performance, strength and what the Roman architect Vitruvus referred to as "delight" are the result of a synergy of materials and methods. Students had to select one of 3 choices of weak material—newspaper, cardboard or satay sticks.

What were the learning outcomes of this project?

The primary objective of the project was for students to develop strategic and integrative thinking skills through experiential learning. They went through the process of exploring the materials, deriving the concepts as well as making, testing and evaluating prototypes to formulate problem-solving strategies. The outcome we hoped to see was that they would develop a strategic thinking approach to conceive construction intent and apply integrative thinking skills to achieve instrumentality and delight in their architectural solutions. In this project, the students went through iterative cycles to yield the following outcomes:

i. Ability to develop strategies in strengthening weak material.

ii. Ability to formulate methods to connect weak material with timber.

iii. Ability to synergise paradigms for designing solutions.

Building the prototypes and putting them through various stress tests.

What sort of pedagogical approach or strategy did you employ for this project? In what ways did these approaches/ strategies enhance student-centric learning?

Teaching construction has largely been prescriptive. It leads students to instrumental and conventional solutions, and is taught separately from their design learning. This project attempts to bridge this gap and more importantly, enable students to develop their own paradigms arising from their understanding and interpretation of their experiences as they try to solve these problems. This epitomises the constructivist model of learning, in which students construct knowledge and formulate concepts by experiencing such situations and reflecting on them. It is constructive and process oriented, and involves students reframing these problems through iterative and responsive actions. For instance, they may constantly evaluate how each activity in this project is helping them gain a better insight to the problem. These iterative reflections enable students to become more "self-directed" in their learning, and they gain a better sense of knowledge ownership.

Tell us more about the studio space in which the students worked on their projects. What advantages did using such a teaching space offer to both students and educators?

Architectural students spend a large part of their learning time in the design studio. The studio is where the design tutor conducts exploration and investigation into issues affecting architecture. It is a stage for project-based or problem-based learning. For the first year students, it is where they acquire fundamental design thinking, visualisation and design communication skills. The studio sessions are conducted in two afternoon slots, making up 8 hours of lessons per week. In reality, students spend an average of 10 hours per day in the studio for the entire week, including the weekends when the submission deadline for their projects is due. In a way, this is the most memorable space for architectural students: they learn, design, think, imagine, draw, make, discuss, conduct their presentations, eat and sleep in the studio. It is a dynamic and flexible space that supports various design activities. The working tables also facilitate the quick translation of ideas on paper into rough models for their studies in space and form.

For "Span the Camel", the studio became a "laboratory" for students to develop strategies in strengthening their newspaper or cardboard structures, and a "yard" for fabricating prototypes. The nature of the learning process and the studio set-up helped to foster strong mutual learning and team bonding among group members. The physical arrangement of the senior year studios and tutor rooms at the perimeter of the first year studio also had the advantage of providing quick consultation opportunities.

The location of the tutors' rooms at the studio's perimeter (see photos above) made it easy for students to seek consultation if they ran into problems while building their structures.

In this year's ATEA & Honour Roll special, we asked this year's award winners for their thoughts on various issues related to student centricity in teaching. Here are their responses.

What Is Your Idea of Student Centricity?

**Assoc Prof
Philip Holden**

Dept of English Language & Literature,
Honour Roll recipient

Mr Ng Wee Seng

Dept of Mathematics,
ATEA winner

Student centricity is something of a buzz word in discussions of education, and most teachers at university level would see it as a desirable goal. Yet when educators discuss student centricity, they frequently limit its scope to instances of interactive classroom practice that enable students to express their ideas, perhaps through the use of group work and the facilitation of discussions. Yet student centricity is much more than that, and can be facilitated by many methods. Student centricity, for me, involves encouraging students to think of themselves as the creators of new knowledge, rather than simply internalizing and applying ideas. Learning thus becomes both a way of looking within oneself and a means of acquiring agency to act in society. Student centricity might thus envision all of us involved in the process of education as students, and see learning as a means of centering the self in preparation for both self-exploration and a transformed relation to a larger social world. ■

To me, student centricity is about creating a vibrant learning environment in which all students take full ownership of their learning and participate actively in the learning process through interactions with both the teacher and their peers. Student centricity is also about enabling every student, regardless of his background and competence, to progress at a pace that best suits him, so that while the more capable learners can excel, the less able participants can overcome learning difficulties and attain a reasonable level of proficiency. Student-centric teaching has to be built on a foundation that emphasises a close and interactive working relationship between the teacher and the students, with all participants sharing a common goal of making the learning experience in the class enjoyable and rewarding. ■

Dr Eric Chan (standing, first from right) at the party with colleague Dr Ho Han Kiat (standing, fourth from right) and their undergraduate and graduate students.

Dr Chan Chun Yong, Eric

Dept of Pharmacy, ATEA winner

Student centricity in teaching is a paradigm shift from a focus on the teachers and what we teach, to our students and what they learn. Engaging our students goes beyond the classroom and laboratories, as shown in this picture taken during a Christmas party. When students are deeply engaged with their teachers, they develop a strong feeling for learning and this forms the basis of student-centric education in the university. ◼

Assoc Prof Gong (standing, fourth from the left) with his students

Assoc Prof Gong Jiangbin,

Dept of Physics, ATEA winner

All students at NUS deserve a fruitful and enjoyable learning experience through which they learn how to learn actively, think critically and communicate effectively. This can be achieved if we lecturers keep students' long-term needs in mind and instil our students with a passion for learning. ◼

Dr Yeo Ye

Dept of Physics, ATEA winner

I believe the essence of student centricity is that students are active learners who construct their own knowledge. In a student-centric approach to teaching, the role of a teacher is therefore to provide the necessary conditions and opportunities to facilitate those constructions. More importantly, the teacher serves as a companion to his or her students in their great adventure of exploring the world of knowledge. This means that both the teacher and students must interact closely with each other, in a constant interchange of information and ideas. Over time, this process of actively engaging each other in intellectual discourse will enable each student to develop his or her own unique taste for a subject and style of acquiring new knowledge. This, I feel, is essential for anyone to become a lifelong learner. ◼

Adopting a Student-centric Approach to Teaching & Learning

Our teaching award winners share their thoughts on what a student-centric approach to teaching and learning should entail.

Assoc Prof Milagros Rivera
Communications & New Media Programme, Honour Roll recipient

Dr Ingrid Maria Hoofd
Communications & New Media Programme, ATEA winner

I think that it is important that we, as educators, understand what our students' learning expectations are. I always ask students what they expect to get out of the module I am teaching to make sure I can meet those expectations. If their expectations are not in sync with the goals of the module, then I have the opportunity to explain to them what the course will actually deliver. Once the course gets underway, I give them guidelines on how to complete the assignments and projects. Those guidelines are meant to help them understand what is expected of them without restricting how they can fulfill the course requirements. It is funny because often, students feel uneasy about having too much freedom to explore ways to fulfill the class assignments. Once they realise that they can be as creative as they want, they take off! In a freshman seminar I taught recently, each student had to lead a seminar as part of their class participation. I gave students general suggestions, but left the details of how to fulfill this part of their continuous assessment to them. They came up with fun and very creative ways to discuss the issues. The best part was that once they got the hang of it, each student tried to outdo the other and in the process, they learnt that there were many approaches to generating class discussion—some used the traditional approach while others came up with quizzes and games. It was a rich and rewarding experience for them and for me. ∎

My aim of providing student-centric teaching and learning means that, as an educator, I need to provide equal amounts of authority and anarchy, of structure and freedom, of clarity and confusion. Only this careful balance will bring about the proper amount of hand-holding and openness that students require to truly learn. It also means that for me, teaching should never solely centre on the student, but also revolve around my own norms and values as a teacher and as a human being. The difficulty for me as a teacher is that such a balance may challenge the authority of my teaching position, the canonical texts that ground my teaching, and even of the university itself. However, I have found that it is only by providing this space for students to potentially contest the authority of the teacher and her institution, and to appreciate the ambiguity of the learning situation, which eventually allows them to develop real critical thinking skills and wisdom. In other words, students should not only learn the practicalities and theories which enable them to get on academically and be employable, but also learn the skills which will make them fulfilled and engaged human beings. This allowing for what I call "hospitable thought" is what I understand as true student-centric learning. ∎

Dr Loy Hui Chieh
Dept of Philosophy,
ATEA winner

**Professor
P Gopalakrishnakone**
Dept of Anatomy,
ATEA winner

The Chinese philosopher Mencius once told a story about an impatient farmer who pulled at his seedlings because he was worried about their failure to grow and consequently, the seedlings all shriveled and died. The point of the story, which is really a picture of the process of (moral) education conceived in a student-centric manner, is not that the farmer and educator have no role to play in the healthy growth of the plant and the learning process of the student. After all, there is such a thing as leaving the seedlings unattended, failing to water, tend or weed it. Indeed, student-centric teaching and learning begins with and is sustained by a firm commitment to the understanding that the student has a nature and potentiality that has a dynamic of its own, which the educator has to respect. However, the crucial fact remains: student-centric teaching and learning is neither happenstance nor about letting things be. The teacher has to plan carefully for it in advance and constantly work hard to provide the right sort of classroom environment that encourages its occurrence, challenging students to embark on the quest for knowledge every step of the way, but without forcing the issue. ■

According to Dr Loy, adopting a student centric approach in teaching requires the same care and attention that one would devote to nurturing a seedling to maturity.

I have always given my students free rein when it comes to learning. I strongly believe in the saying, "Give a man fish and he will not be hungry for one day; but teach him how to fish, and he will not be hungry in his lifetime."

Allowing students to think for themselves gives them a certain freedom of expression, as well as the satisfaction of knowing that they can grasp seemingly difficult concepts through self-directed learning. With this satisfaction comes the confidence that I feel is necessary for all students to possess in their education. A confident student is one who knows that he can find answers to problems when put to the test. Hence, he becomes more pro-active during class discussions and will eventually be keener to learn beyond the scope of his syllabi.

We have to breed enthusiasm, inspire confidence and stimulate self-reliance in our students when it comes to motivating them to seek knowledge. It is only then that we can nurture lifelong learners who are creative, mature and think critically.

I like to impress upon my students that "Medicine is a vocation and it deals with human life". Hence, they should rise above petty temptations and think instead about sharpening their skills in problem solving and how to be more effective communicators.

Inspire, encourage and reassure them of their abilities, and I believe that any student will be able to become the best that he can ever be. ■

ATEA & Honour Roll Special 2010

Assoc Prof Pan (far right) with his students during an overseas study trip.

Assoc Prof Pan Shan Ling
Dept of Information Systems, ATEA winner

To me, a student-centric approach is about the development of my own expertise in creating, contributing to and using case study methods to facilitate **experiential and evidence-led learning**. Achieving these goals required dynamic interaction between my research and teaching practices. My work as a case study researcher also provided me with unique access to rich and deep knowledge from real organisational contexts and situations of information systems use in Asia. Over the last few years, I have spent considerable effort reconstructing that knowledge into teaching materials and methods for use in the classroom. Teaching with case studies has served not only as an effective methodology to bring relevant, first-hand experiences and knowledge into an evidence-based education, it has also promoted the self-discovery and construction of knowledge in our students through the evaluative discussion of their perspectives in a collaborative environment. To achieve these goals, much of my work as an educator has revolved around enhancing my own capabilities in case-based teaching. This includes not just the adoption, but the creation of teaching-based case study materials for use in the classroom. It is through this marriage of evidence-based learning and traditional instruction that I find the interplay of business and information technology can be elegantly and interactively appreciated and mastered by students in a collaborative manner. ■

Dr Christian Boucharenc
Dept of Architecture, ATEA winner

A student-centric approach is firstly about active learning, where students develop their individuality, acquire much needed knowledge and develop their own planning ability. For most undergraduates at the prime of their youth, character building is essential to prepare them for the travails of later periods in life. The interaction between tutor and students should help guide the development of students' creativity, originality, problem solving skills, communication skills, and their self-esteem, thus developing their own unique individuality. Secondly, a student-centric approach in design would involve a teaching structure where students are encouraged to acquire the specialised "design language" or "vocabulary" which can help them better understand complex graphic and architectural design compositions. Students should no longer be passive receivers of knowledge but rather, increase their knowledge through experimentation and discovery. Last but not least, my notion of a successful student-centric approach should inspire students to develop their own planning skills. From the time they leave the classroom environment, they would be able to exercise good self-management skills, negotiate efficiently in teams, and adopt a methodical approach to work through a variety of tasks. ■

Dr Boucharenc (standing, in black T-shirt) conducting a class in the studio.

Dr Lilian Chee,
Dept of Architecture,
ATEA winner
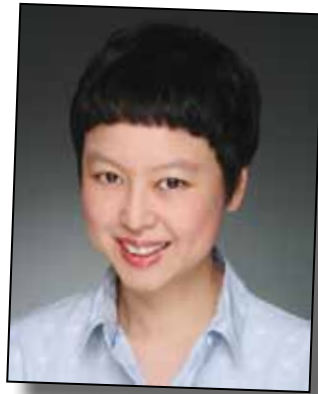
My students tell me a student-centric teacher:

• **listens to them**: "... I appreciate the open-mindedness and receptivity you demonstrated towards our ideas."

• **believes in them**: "... The personal and active interest which you undertake in each of our work is in itself an inspiration for us to do our best."; "She never gives up hope on her students... you can feel that she really wants to help us improve."

• **challenges them to be the best that they can be**: "You also constantly challenge us to go beyond the boundaries of architectural academia..."

• **guides them with timely and constructive feedback**: "... gives useful, to the point suggestions and help. She is one of the rare tutors who explains my mistakes..."; "... She is also concerned how we have grown and learnt..."

• **walks the talk**: "Her passion for the subject is infectious..."; "She has inspired us to read and to think critically..."; "... she never comes unprepared..."

• **cares for them as individuals**: "She does not just throw us into the deeper end of the pool but constantly aids us in achieving our little targets [which are then] set higher and higher each time."

These tenets inspire my growth as a teacher. ■

Dr Grace Wong
Dept of Real Estate,
ATEA winner

Although the teaching of thinking skills could enhance content learning, another more important consequence of teaching thinking is the effect of such teaching on students' behaviour. As the curriculum's content and structure are likely to change over time, achieving content learning is likely to be an educator's short-term goal compared to nurturing students' perception and attitude towards learning and thinking. Yet, such qualities are likely to endure and pervade beyond the context of any module.

It is with this philosophy in mind that I formulate my teaching methods and module features to provide an environment that is conducive for constant learning and thinking, while at the same time offering opportunities for students to develop the qualities and habits that will make them independent, inquisitive, active and astute learners. In my opinion, education, like cooking, is not just dependent on the content or ingredients; the process itself is often the one that determines the final outcome. ■

Annual Teaching Excellence award Ceremony & the OUTSTANDING educator award public lecture series 2010

OEA winners Assoc Profs Phil Chan (top photo) and Narayanan Ganapathy (middle) delivered their respective lectures to a rapt audience.

On 27 May 2010, we had the opportunity to hear this year's Outstanding Educator Award (OEA) winners Assoc Prof Phil Chan Aik Hui and Assoc Prof Narayanan Ganapathy share their experiences and expertise in teaching and learning as part of the OEA Public Lecture Series.

Assoc Prof Chan kept the audience engrossed as he related his experiences in using epistemic games not only to get his students interested in the various theories and principles in physics, but also to develop their critical and cognitive abilities.

Assoc Prof Narayanan was similarly engaging, impressing upon our audience the importance of producing empathetic knowledge in students, where what they learn comes alive as they develop the capacity to relate the academic discourses they absorb in the classroom with the everyday experiences of ordinary people.

We were also honoured to have Deputy President (Academic Affairs) and Provost Professor Tan Eng Chye present certificates to the 44 recipients of this year's Annual Teaching Excellence Awards (ATEA) and the latest batch of inductees to the Honour Roll. ■

Visitors to CDTL

Over the previous semester, CDTL was pleased to receive the following local and overseas guests who came to learn more about our programmes, as well as to exchange notes on the latest pedagogical developments and share experiences in effectively engaging students in a higher education setting. ■
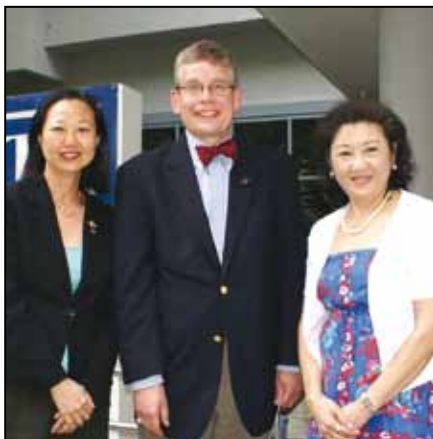
May 2010: Dr Teng Su Ching from SIM University and Dr Paul C. Pribbenow, President of Augsburg College, Minneapolis, USA.
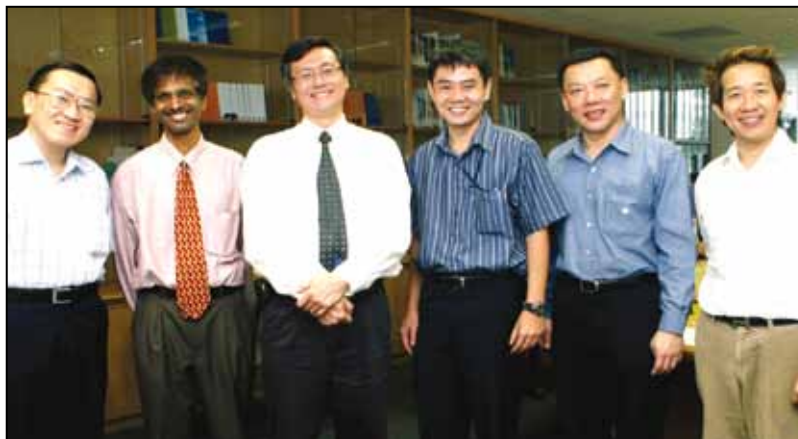
June 2010: Visitors from Nan Hua High School, Singapore. Second and third from right: Mr Michael Lau, Vice-Principal and Mr Joel Teoh, HOD/Maths, with Provost and NUS colleagues Assoc Profs Goh Say Song (left) and T.C. Chang (right).

July 2010: Dr Sage Leslie-McCarthy, from the Australian National University

July 2010: Dr Marlena Kruger, Director of the Centre for Technology Assisted Learning at the University of Johannesburg in South Africa

Announcements

CDTL welcomes the following new staff who joined us recently:

- May 2010: Mr Alan Soong as **Senior Education Specialist**. Alan has been working in the area of professional development in higher education since 2002. He will be conducting research as well as staff and student workshops on various pedagogy and learning issues.

- June 2010: Assoc Prof Lakshminarayanan Samavedham as **Deputy Director (Professional Development)**. He will lead CDTL's programme team in developing pedagogy-related programmes and initiatives for NUS teaching staff. ■

We would also like to bid farewell to our Publications Manager, Ms Teo Siok Tuan, who is leaving to pursue further studies. We wish her success in her future endeavours. ■

PUTTING STUDENT-CENTRIC TEACHING TO PRACTICE

Our teaching award winners tell us about what they have been doing in their classrooms to enrich their students' learning experiences.

Ms Susan Tan
Centre for English
Language Communication,
ATEA winner

**Assoc Prof
Lakshminarayanan
Samavedham**
Dept of Chemical &
Biomolecular Engineering,
ATEA winner

When I teach students to compose their academic essays in the module SP1202 "Communicating with the Academy", my main aim is to get students to engage in the process of composing rather than be too concerned about the end product. Often, students are too fixated on the end goal and forget that the most important parts to learning take place along the journey. As they struggle with ideas and expressions, feelings of fear and inadequacy inevitably surface. One of the most difficult tasks is to help students to talk through their doubts and inadequacies, and to find ways to deal with them. For example, I often hear students say, "I don't think I am clear enough in my writing. I am afraid people won't understand me." The approach I take is to help students analyse the problem: Is this because they do not have enough information? Or perhaps it is because their language or choice of words is not precise enough? As students learn to break down their "fear/doubt", they become much more engaged in the writing process. At the end, I not only want to see students know how to write well, I hope that they learn to enjoy writing. ▪

When students come to the university for learning, it is natural for them to expect teaching methods to be geared towards making learning happen effectively and efficiently. Over the years, I have found that aligning my teaching modes to the learning modes of my students helps to create a resonance effect in my classes, rendering my role as a learning facilitator that is much easier and more enjoyable. Such alignment naturally leads to a student-centric approach where the "energy" and "resources" needed to keep the class going (in lectures and tutorials) comes from the students. To do this, I incorporate variety in my classroom instruction and assessment to cater to their different learning styles and abilities. I ensure that students maintain an "active learning" mode for most of their classroom time by getting them to solve challenging conceptual or computational problems individually or in small groups. The domain knowledge or solution to the problem is then pieced together using student responses rather than through my lecturing. It provides opportunities for them to receive immediate feedback in the classroom from their peers and me, with a view to attaining a higher quality of learning. Overall, I endeavour to provide students with a one-on-one learning experience via face-to-face interactions and through the use of electronic media. ▪

Dr Martin Lindsay Buist
Division of Bioengineering,
ATEA winner

Dr Seow Teck Keong
Dept of Biological Sciences,
ATEA winner

Upon completion of the final exam for my electrophysiology module, a student came up to me and said, "That was the scariest module I have ever taken." I asked my student whether the exam was really that difficult, to which the response was, "No, the exam was fine, but I didn't realise that so many things could go wrong. After class I kept worrying that I may have one of the diseases we talked about."

Throughout the module, fundamental engineering and life science concepts were intentionally linked to their clinical relevance to provide a practical application the students could relate to. In addition, all the students in the class have a heart, muscles, nerves and a brain, and it takes little time to point out that what is being discussed in the module is currently happening inside all of them. In more general terms, to engage our students I like to consider what they have in common that can be related to the topic at hand (i.e. personal relevance to the student) and what examples I can use to illustrate relevance in a wider context. ■

With the majority of students in my classes being non-majors in life sciences and would probably not be reading any other biology-related modules, it is an imperative to enrich their experience of reading these modules by providing relevant examples. For example, when teaching about fats and lipids, instead of just showing and explaining about the chemical structures of lipids, I would also make mention of what is meant by terms such as "omega-3" and "trans fat" that they see on the packaging of many of the products they use on a daily basis, especially food products. This would help the students relate what they learn with what they use or consume. ■

ATEA & Honour Roll Special 2010

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Dr Caroline Brassard
Lee Kuan Yew School of Public Policy, ATEA winner

Lately, I have experimented with designing assignments in collaboration with external stakeholders (such as non-governmental organisations) so that students can not only receive feedback of their work, but also see for themselves its application to real-life issues. I strongly believe that traditional assignments (designed by the lecturer with no other stakeholder involvement) tend to miss out on the opportunity to serve a wider purpose—that of actually being useful to an organisation, an interest group or even an individual. Moreover, feedback from external stakeholders have a very different 'ring' from those of the lecturer, as it clearly demonstrates to students the value of their learning. I also learned from students that this type of collaborative learning is well suited for longer term assignments, and that they also find it beneficial to meet with the 'client' prior to the finalisation of the assignment. I am absolutely convinced that this is the way forward to ensuring deep *and* meaningful learning. ■

Dr Johan Geertsema
University Scholars Programme, ATEA winner

During the second semester of AY2009/2010, students in my class UWC2101H "Writing and Critical Thinking: Power, Space and Pleasure" used Skype to participate in a draft workshop with their peers from Stanford University's "Program in Writing and Rhetoric". When writing, students often find the concept of the 'reader' a very abstract one to grasp. Peer reviews therefore provide students with a key learning experience: they demonstrate the importance of providing orientation to actual readers. Writers need to assume, especially within an intellectual context, that whoever is going to read their work will be skeptical of the arguments they make. It is precisely the task of an argument to provide evidence-based reasons that will persuade the audience of the soundness of the position being defended. To craft a convincing argument, the writer needs to establish common ground with the reader, which involves providing orientation. This entails explaining what the problem being addressed is and why it matters, establishing the bona fides of sources, and summarising as well as critically analysing the arguments these sources propose, to show how they relate to the writer's own position. Ordinarily peer review involves only students from the USP. What made our Stanford-NUS workshop so enriching was that students' ideas were exposed, in real time, to strangers from halfway across the world. After the Skype session, students followed up with thoughtfully written peer reviews. This real-life 'orientation laboratory' built goodwill and helped advance their writing projects significantly. ■

Students taking UWC2101H use Skype to communicate with their workshop mates from Stanford University. Photo courtesy of Dr Alyssa O'Brien from Stanford University.

**Assoc Prof
Teofilo C. Daquila**
Southeast Asian
Studies Programme,
ATEA winner

I have used case studies in both undergraduate and postgraduate modules to promote a student-centred teaching and learning environment. In Week 11 of Semester 2 AY2009/2010, students taking my modules were divided into smaller discussion groups, taking into account their diverse academic backgrounds and nationalities. Each group was given a set of articles sorted according to themes that included current issues such as Asia's growing automotive and ICT industries, national, regional and global competitiveness, the rise of China and its impact on Asia, increasing labour flows and economic regionalism. The groups discussed their articles based on common themes, relevant theories and concepts, the author's argument(s), their group's views, the issue's relevance to their own country of origin, and the lessons learnt. In Week 12, the groups presented the results of their discussions, followed by a question-and-answer session and a general discussion.

Using case studies has proved to be useful as it distinguishes students with different abilities by their preparation and presentation skills, creativity and resourcefulness. It has also enabled them to relate the theories and concepts they learnt to real-world examples, and to develop their interpersonal, thinking and communication skills. According to student feedback, the use of case studies has, among other things, encouraged their creativity, promoted teamwork spirit and enabled them to learn from one another. It has also given them the opportunity to choose their own research topics and has increased their knowledge. ■

Students using the whiteboard during Assoc Prof Daquila's class for their case study discussions.

Calling All Writers

CDTL invites articles on any teaching and learning topic for the following two publications:

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email: cdtlsd@nus.edu.sg • Tel: (65)-6516 4692 • Fax: (65)-6777 0342 ■

TEACHING & LEARNING ABOUT SERIOUS GAMES, TO TEACH & LEARN

Dr Timothy Marsh
Communications and New Media Programme

How do you take students from various backgrounds and departments (e.g. business, computing, engineering, architecture, medicine and the social sciences, etc.), who have no prior knowledge of learning theories or any teaching experience, and with limited (if any) knowledge, experience and practical skills of creating digital games or media, and help them reach a level where they can create digital games and media for learning, publish their final assignments, have their works shown at premier international media and games conferences, and even win awards? One approach is to let them take the graduate module NM5211 "Serious Games & Learning Media".

Games for learning, or serious games as they have come to be known, are games and simulations which can be used to inform, learn, train, persuade and influence. Serious games are now being used in many discipline and application areas, including the education, business, government and health sectors. For example, in classrooms in Singapore and the world over, there are already plans to introduce serious games to complement existing teaching materials and

Screen capture of a serious game for learning by NM5211 students

Students take a guided tour of Baba House for their respective projects

resources. A major advantage of using games for learning is their potential to engage and motivate; they can also be used at home or on the move. However, the successful integration of games into education is not as straightforward as simply combining elements of game play with elements of learning. It also involves more than just introducing the game into the classroom and expecting it to be assimilated seamlessly into the curriculum. Students taking the NM5211 serious games module at NUS must consider these as well as other factors and challenges.

NM5211 is largely driven by students' abilities, interests and their respective academic backgrounds. The module carefully blends emerging theoretical foundations with hands-on practical workshops through instructional sessions, presentations, discussion, critique and application. For their final group assignments, they designed and developed prototype games, virtual and mixed reality environments, machinima (i.e. using real-time graphics rendering machines, mostly 3D, to generate computer animated short films) as well as interactive digital media and art for learning. Their assignments were linked to real-world problems and situations. For example, the theme of their assignments for AY2009/2010 was Baba House, which is managed by the NUS Museum.

Baba House is a restored townhouse and living heritage home, one of Singapore's last remaining residential Straits Chinese townhouses. Visitors to the house get to explore the rich history, culture and identity of the Peranakans in Singapore.

In the second week of the module, the students were given a guided tour by Ms Foo Su Ling, the manager of Baba House. They were then given their assignments—to develop a digital prototype of Baba House, either as a game, simulation, machinima or a novel interactive digital media or art. During the subsequent weeks, the order of topics and sessions for this module was largely determined by student needs, according to the format they selected to develop their respective prototypes.

In the final week of the module, students presented and demonstrated their final group assignments at the NUS Museum in the University Cultural Centre, with an invited panel of judges including Ms Foo and Professor Ryohei Nakatsu, Director of the Interactive and Digital Media Institute (IDMI) at NUS. The submissions included games and an interactive exploration of Baba House, an interactive restoration and painting installation, machinima films as well as a simulation in Second Life. In fact, one group is currently in discussions with Ms Foo about the possibility of

What Is Really "Higher" in Higher Education?

Outstanding Educator Award (2010) Winner Phil Chan Aik Hui

Outstanding Educator Award (2010) winner Assoc Prof Phil Chan Aik Hui, from the Department of Physics, reflects on the true spirit of higher education and the Socratic method, as well as how educators can apply this method to effectively engage their students and cultivate their capacity to be critical thinkers.

Higher education—An intellectual method with philosophical habits

To me, higher education should not be a platform where students are painlessly graduated without ever leaving their intellectual comfort zones. According to Palfreyman (2008), there is nothing really "higher" about being a student in higher education unless the scholarly process has taken place. This will ensure graduates possess "a connected view and grasp of knowledge gleaned from lectures; and are intellectually methodical in pursuing scholarly excellence" (Palfreyman, 2008). In short, higher education develops lifelong habits of the mind and attributes such as freedom, equitableness, calmness, moderation and wisdom, as well as 'a philosophical habit'. As such, higher education is liberal education as a learning and teaching process.

However, liberal education is not just about studying the humanities and social studies. Palfreyman (2008) defines a liberal education as "not so much about the subjects being studied, as it is the spirit in which the study is conducted". As such, any curriculum can be a liberal education provided the study is done in the proper spirit. A liberal education (not to be confused with general education) instills both respect for facts and a healthy skepticism about the reliability of what is commonly taken to be facts, "correct" theory or the truth.

Applying the Socratic method with epistemic games

One way to facilitate the process for liberal education is to apply the Socratic method of teaching in our classrooms. The Greek philosopher Socrates initiated this method via questions and answers through which man can get to know himself. It is characterised by a philosophical method of using a series of instructions and arguments. In the extreme Socratic mode, the teacher should discard textbooks and encourage students to rely on their innate ability to critically think through a situation.

We can apply the Socratic method to our classrooms by playing epistemic games through epistemic forms. Epistemic forms are target structures that guide inquiry while epistemic games are general purpose strategies and rules learners can use to analyse a subject by filling out a particular

epistemic form (Collins & Ferguson, 1993; Sherry & Trigg, 1996). The forms and games are considered epistemic because they involve the construction of new knowledge. The analogy here is that of a chess game—each player's placing of a chess piece on the checker board marks the realisation of defined rules of the game. Historically, the periodic table and prediction of new elements (i.e. new knowledge) are the results of such an epistemic game.

When Socratic thinking is internalised through the "playing" of epistemic games, we may clarify and crystallise existing knowledge to eventually help students create new knowledge by themselves. These games may also assist dons to curb our temptation to over teach. However, it should not function like a junior college classroom, where teachers cover all possible scenarios on how each topic may be tested in an examination. Adhering to the strategy to "teach less and learn more" will give students the academic freedom to query and think for themselves. The epistemic forms can also guide us in designing tutorial activities, tests and examinations. Such games are equally effective in assisting students in critical essay writing as the basic idea of an essay is to weigh facts and attempt an argument (Devan, 2007). Essays should ascertain, probe and basically place a thought on trial.

Socratic enquiry is particularly useful for ontological, epistemological and historical discussions. Ontology deals with the nature of being (i.e. the nature of the system as it actually exists) while epistemology deals with the theory of knowledge (i.e. our knowledge or conception about a physical system). So what is the difference? Epistemology deals with the knowledge built up from our observations, whereas ontology refers to attributes the system has, independent of whether one observes them or not. For example, in physics we say the electron has a spin but it is not really physically spinning! Finally, one should note that to understand a science, it is necessary to know its history.

Socratic methods are able to facilitate powerful open-ended questioning and inquisitive approaches, which may or may not necessarily have definite or physically meaningful solutions to say physics enquiries. As such, I firmly believe as far as possible that Nature should be the final arbiter, showing students physical demonstrations and physics experiments wherever possible. The

teacher's role is to show the student how to decide which questions are important and evaluate the answers that Nature gives. Indeed, there is no higher authority in physics than Nature itself.

The Socratic method—A two-way process

Students must be allowed to make and learn from their own mistakes. I'm often amazed by how quickly we turn students off by giving them the answers to their questions rather than giving them time to think, or having them do the experiments and wait for Nature's response to their questions. When students become accustomed to hearing about and working with things that they do not completely comprehend, they are well on their way to becoming better educated and more critical thinkers. Socratic enquiry allows us to "punch holes" in students' learning. It may be an uncomfortable process but in the long run, the ideal educated mind will be like a sponge—full of "holes", yet very flexible and inspired to absorb new ideas, as well as unlearn or replace old questionable ones and eventually create new knowledge.

Concluding remarks

We reiterate that higher education, or what we know as university education, is actually liberal education. It is characterised not so much by the subjects studied but by the spirit in which the study is conducted. There is really only one method to achieve higher education, namely the ubiquitous two-way Socratic method, where students are allowed to query their teachers and have the freedom to think rightly or wrongly without inhibitions whenever possible, allowing nature to be the final arbitrator. One concrete modern realisation of the Socratic method is to play epistemic games through filling epistemic forms. Finally, to teach is to learn; teaching is the reflection of learning, Aristotle summed it aptly when he referred to teaching as "the highest form of understanding".

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SPAN THE CAMEL: AN EXPERIENCE IN STUDENT-CENTRIC LEARNING

Some of the students' completed structures on display.

Were there challenges as well?

Yes, definitely! For one thing, they were working with limited space within an old building. On several occasions, the building of their models or prototypes spilled into the corridors and stair landings. An ideal arrangement would be to have each studio space supported by an adjacent model-making workshop. Another possibility would be to decentralise a portion of the main workshop to equip this designated space with light equipment and tools. In his book *The Hand: How Its Use Shapes the Brain, Language and Human Culture* (1998), neurologist Dr Frank Wilson mentioned that one really cannot separate what is in the mind from what is in the body. He also states that knowledge is really the whole behaviour of the whole organism, and education cannot be just about focusing purely on the mind itself. In a way, design thinking and learning involve both the mind and the hands. A better integration between the studio and the workshop will enhance the iterative and learning cycle.

What sort of feedback did students give about their learning experiences during the project?

Every student described the project as being a fun and enriching learning experience. Most importantly, the majority found the approach effective in helping them understand the interdependence of design and construction. They also recognised the importance of having firsthand knowledge and a good understanding of material properties, and the use of that knowledge to generate ideas and design solutions. Finally, the realisation of their completed projects provided most of them with a great sense of achievement.

In conducting this project for future student cohorts, what aspects of the project structure would you retain or do differently to enhance student centricity?

One of the key challenges of running the same project for the second time will be the issue of "precedent baggage". There were 34 entries for this project and it will be challenging to have the project stretch the next cohort's abilities and capacity to innovate, while ensuring that they are not overtly influenced by their predecessors' works. For example, we may need to adjust the project's specification to include material efficiency as one of the objectives.

Thank you, Mr Cheah, for taking time out to talk to CDTLink about your teaching experiences in conducting this course!

Reference

Wilson, F. (1998). *The Hand: How Its Use Shapes the Brain, Language & Human Culture*. New York: Random House USA Inc. ■

Teaching & Learning about Serious Games, to Teach & Learn

The author (front row, third from the right) in front of Baba House with his NM5211 students.

extending their project in Second Life to enable people the world over to visit Baba House and get a virtual experience of exploring this living heritage home.

Every year since the module's introduction in 2007, NM5211 students have presented, published and won awards for their final assignments, including a paper describing their final group project which received the runner-up Best Full-Paper Award at the premiere ACM SIGGRAPH[1] Video Games Symposium which was held in Los Angeles in August 2008. The students' project was a game which they devised for learning about music theory, pitch, time signature and dynamics in music, through play. The following academic year, NM5211 students presented a paper on their final assignments at the International Simulation and Gaming Association's 40th annual conference in Singapore. More recently, six NM5211 serious games students were winners of Asia's SHOOOT Fiesta 2009 media awards for their final assignment, a machinima film on Baba House.

Endnote:

1. ACM SIGGRAPH stands for "The Association for Computing Machinery's Special Interest Group on Graphics and Interactive Techniques". ∎

Nurturing Student Centricity in NUS

formal curriculum as well as the informal learning environment, to help students realise their potential.

It is heartening that some of the curriculum design and pedagogical approaches that are currently being practised by our colleagues embody good examples of student-centric learning. These include the Freshmen Seminars and writing programs currently being piloted in various Faculties. Other examples I have observed include student research projects such as the Undergraduate Research Opportunities Programme (UROP), our alumni mentorship programmes, career guidance and preparation programmes, internships and international exchange programmes.

The challenges involved

I would say that creating the right culture would be one of our greatest challenges. Physical environments and processes can be established or reformed quite easily, but having the right motivations and attitudes towards student centricity are more critical. I believe the NUS leadership is committed to student centricity as one of its core values, and it will want to create the necessary conditions and support systems to sustain these objectives. It is now up to the NUS community to make this work.

Endnote:

1. This quote was taken from a profile of Professor Tan which appeared in the Apr-Jun 2010 issue of the *AlumNUS* magazine. ■