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Extending CDTL's Mission

Associate Professor Chng Huang Hoon
Director, CDTL

Dear colleagues,

Greetings for 2009! I hope the December break has been a restful one for you, and that you are now ready for a brand new year. As we embark on the start of this new year, I thought I should get in touch with fellow colleagues and share some thoughts with you.

As many of you are aware, CDTL has established many programmes under the leadership of our colleague, Associate Professor Daphne Pan. During Daphne's tenure as Director of CDTL, she has built up various in-house programmes, including the Professional Development Programme–Teaching (PDP-T), the Teaching Assistants Programme (TAP), the Student Workshop series and CDTL's education conference series Teaching and Learning in Higher Education (TLHE). In addition to these programmes, CDTL has also released many publications, including *CDTLink*, *CDTL Brief* and *Ideas on Teaching*.

I wish to record my gratitude to Daphne for providing me with a foundation to build on and to extend the CDTL mission. For a start, I wish to share with you some of these plans that I would like to implement at CDTL. I welcome your ideas and feedback on any of these initiatives that I am outlining below, because CDTL is not about me—it is about all of us and what we share as NUS academics.

CDTL frequently receives many foreign visitors. Within my first four months as Director, CDTL has hosted visitors from Australia, Denmark, Ireland, Philippines and South Korea, and we will be receiving another set of visitors from Canada this month. I am constantly amazed by how much these visitors wish us to share our expertise with them, and they often express their envy that we have so many established programmes and resources

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dedicated to promoting good teaching at NUS. Many of these visitors have also urged CDTL to engage in regular sharing of information with them. With such requests in mind, here is something I have on my wish list for CDTL—to establish a teaching exchange scheme during my term as Director. First, I will need to obtain the funds that will enable our colleagues to do short teaching-related visits to other campuses or at centres similar to CDTL, where they have the opportunity to share their teaching expertise and also gain from observing how other people teach in different settings. At the same time, I am envisioning this scheme to allow for foreign colleagues to make similar visits to NUS to give us the benefit of their teaching expertise. I see such a scheme serving at least two important functions for us—as an outreach effort to showcase our own expertise, and as a platform to effect teaching exchange. If you have thoughts about how this idea can be usefully developed, feel free to contact me at CDTL!

The above proposed scheme, when approved, will surely extend our reach and benefit us as teachers and educators. I am also considering initiatives that will enhance our students' learning. CDTL has organised many workshops for undergraduate students in the past. In the first quarter of this academic year, we held two student dialogues with the Vice Provost (Education), Professor Tan Thiam Soon. I am also hoping to enrich and extend the Student Workshop series in at least two ways: (1) to introduce academic dimensions to our students' learning at NUS; and (2) to have more targeted workshops that will help our graduate student population. What I have in mind is to introduce more research skills-related training for our students; to gather students together for focused group or roundtable discussions on issues that are important to their academic or professional development; and to generally focus on their needs as learners in a tertiary context. Again, I welcome your input and your help in realising this plan.

Beginning January 2009, I will have additional help at CDTL. I wish to introduce our newly appointed Deputy Director (Programme and Research), Dr Wu Siew Mei, and welcome her to the CDTL team. With Siew Mei's help at the Centre, I expect to have more time (and energy!) to introduce more new initiatives that will extend and enrich CDTL's mission.

Before I conclude my message, I would like to share some thoughts about one of our CDTL publications, *CDTL Brief*. You will know that the *Brief* has always been a hard copy publication. Following discussions with the CDTL publication team, we are experimenting with a new format for subsequent issues. From 2009, *CDTL Brief* will become an online publication—in part to help save the environment, and also to make it an online platform for colleagues to exchange ideas about teaching and education. I am envisioning the online *Brief* to be the space where we share ideas about teaching, and to discuss and debate about issues that are important to us. I wish for the *Brief* to become a platform where conversations about teaching will take place, and ideas are generated, given time to air and to stew. The online *Brief* therefore invites not just your contributions, but also welcomes your responses to specific contributions. I hope this modest 'revamp' of a long-established CDTL publication will generate new excitement for collegial teaching exchange.

I will have opportunity to share more plans with you as the year unfolds. I am just a phone call or email away; feel free to contact me if you have ideas on teaching and learning that you wish to share with me. I look forward to working with you in 2009 and wish all of you a wonderful year ahead.

Huang Hoon ■

Writing Interactive Digital Stories as Projects

Associate Professor Yeo Gee Kin
Department of Information Systems

The major objective of the module CS1105 "Computing and Society" is to expose students to broad societal issues surrounding the use of information and communication technology (ICT) in everyday life. The topics discussed include digital piracy, security and privacy, social networking and freedom of expression.

The module is currently worth three modular credits (3-MC), and while compulsory for School of Computing (SOC) students, it is also open to students of other faculties. The current implementation involves conducting lectures online with 100% continual assessments (CA). An important component of the assessments is the course project. Previous projects were almost always in the form of a team study report covering topics such as "Youth Addiction in Computer Games" or "Software Piracy in Asia". During the Special Term last year, I initiated Wiki as the platform for the course project. In the second semester of Academic Year 2007/2008, I proposed that the class write interactive digital stories as an alternative format for the team project.

Every story is about an ethical dilemma in ICT. Examples of some scenarios were given, as shown below:

- "I provide IT support in a school. One day, I was asked to upgrade all the computers for the school. While working on one of the dean's computer, I noticed that his computer contained thousands of pornographic pictures."
- "I am an IT professional hired by a big hospital and put in charge of its patient database. My aunt, who works for a health insurance company, approaches me one day to help her get the medical histories and other personal particulars of patients of the hospital who had died of a certain illness, so that her company can formulate a new insurance scheme for such patients."

Students were encouraged to create their own stories, but each must reflect a problem or controversy discussed in the course. As the story unfolds, the viewer responds to the scenario at different stages and branches into another scenario depending on his response. The recommended software for developing the digital stories was Adobe Captivate™. It accepts slides from Microsoft Powerpoint with which most students are already familiar. The students were also told to make full use of the interactive elements and multimedia features in Captivate™ to develop the story. In presenting the dilemma, and prompting actions and answers, some background knowledge of ICT relevant to the storyline and context should be present in some form. How much the story engages the viewers' interest and leaves them with the feeling that they learnt something at the end is important in ensuring the effectiveness of the story.

Figure 1. Example of a story for "ICT Crime", which relates a lesson on tele-fraud

Figure 2. Example of a story for "Dilemma in a University Lab", where students play characters in their story.

There are three progressive reviews and marks of 5%, 15% and 30% were allocated to each stage. The first review was to check on the outline students prepared to approve its suitability of further development. In the second review, about half of the story was expected to have been developed and feedback was given to students to improve their stories.

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Educating Entrepreneurs: A Realistic Approach in a Complex World

Assistant Professor Tim Rahschulte and
Assistant Professor Debora Sepich
George Fox University School of Management

Entrepreneurship has become an interesting subject of discussion. Entrepreneurs (and their process of innovating new venture creation, which is entrepreneurship) are in high demand. This demand is not only to create the next 'gotta have techno gadget', but also to help resolve issues of organisational inefficiencies, facilitate the resolution of national inequalities and address global concerns including those affecting our physical planet, social connectedness and economic vitality. This description suggests that the innovator who mines away in a garage somewhere to emerge months or even years later with fresh technology for production, is nothing more than a stereotype of the past. The complexity of the world today modifies this previously held image; nowadays, the entrepreneur can be anyone with an idea that can address today's problems and has the courage to act.

As the needs of the world have changed, so too have educational institutions. In the United States alone, the growth of entrepreneurial courses has jumped from less than 500 in 1985 to more than 5,000 today. In addition to courses and curriculum, learning centres have been created as part of universities around the globe. (NUS, for example, has an Entrepreneurship Centre that offers experiential education, development, research and support through an Enterprise Incubator Ecosystem).

Educating Entrepreneurs

While entrepreneurship is recognised as an essential part of university curricula, there is little consensus on how to teach new venture creation. However, there is one constant between most MBA and undergraduate entrepreneurship experiences—the business plan. Yet there is more to entrepreneurship than formulating the business plan.

William Bygrave, an entrepreneurship professor at Babson College in Wellesley, Massachusetts, compared the success of alumni new business ventures. He found out that some ventures had formal business plans while others did not (Bygrave, 2005). He also concluded that there was no statistical difference in the success rate. More importantly, he noticed that nimbleness, understanding customer needs and the ability to connect with stakeholders to tell the (corporate or product) story were compelling factors that led to successful ventures. Having been involved with new venture creation and start-up companies, our experiences are consistent with Bygrave's findings. The details of business plans are important, but not so important as to neglect creating a vision and story about the product or company. Guy Kawasaki, one of the founders of Apple Computers, shares this sentiment. He concluded that the business plan is a side note to the business (Kawasaki, 2004). He added that the only time a detailed plan is required is when institutional investors or business angels (i.e. venture capitalists (VCs) and funding institutions) need the plan for due diligence processing prior to investing money in the idea. Even then, the plan comes after the initial pitch to the VCs.

So, while the business case is important, it should not be the focus in the classroom. As educators, sometimes we focus on an efficient way to assess and grade, and an easy way to compartmentalise the teaching. This is often, however, not grounded in reality and therefore offers little practical application for students. The business plan is less than 2% of the business start-up experience, yet in most MBA classes it comprises 75% of the final grade. Why? Because it is easy to do so.

From the experience of starting and selling companies to teaching MBA students entrepreneurship in the course "Creativity, Innovation and Entrepreneurship", the emphasis on the business plan was modified in our classroom. This article details a realistic approach to educating entrepreneurs.

Vet, Pitch, (then) Do

The MBA students we encounter have seven weeks to understand entrepreneurship, creativity and innovation. Prior to our involvement, the course was like many that focussed on detailing a business plan, which was usually a very long document supplemented with an equally long presentation. The weekly class meetings addressed different elements of a business plan (e.g. financials, marketing, operations). Yet the results at the end of the seven weeks did not meet the desired outcome of having a viable product solution or new venture. Something needed to be changed. Hence the class was modified in the following manner:

Week 1—Vetting the Idea and Making Meaning

The first session is spent generating ideas. Most of our MBA students have been thinking about business ideas for years. We encourage them to think big and to 'make meaning'. When asking them to create a solution or even a company that will 'make meaning', we refer to Guy Kawasaki's *The Art of the Start* (2004), which is the unofficial text for the class. The outcome for this first week is for students to create a two- to three-word 'make meaning' mantra for their business. The importance of the mantra is that it is easy to remember and motivates people to get involved with a company that provides meaning and makes a difference.

Week 2—Prototype Development or Making What Matters

The second week focussed on product development, where the development is the basis of telling the story. Students spend time developing pictures, designs and products, whatever it takes to put a formal face to their product/service/solution. However, this is often the stage where entrepreneurs fail to move forward. We tackled this by putting a time limit on this work (one week), which forces entrepreneurs (students) to document something tangible. The outcomes here vary and there are usually drawings, sculptures, flowcharts, mindmaps and other mock-ups. The key to Week Two is producing an artifact which can tell a story about the solution.

We remind students to think big at this stage, using Kawasaki's words to facilitate the class:

> When you create a product or service… people love…don't be surprised when others hate you. Your goal is to catalyze passion—pro or anti. Don't be offended if people take issue with what you have done; the only result that should offend (or scare) you is lack of interest. (Kawasaki, 2004, pp. 11)

Week 3 and 4—Analysing/Testing the Market and Making Changes as Needed

Week Three is spent helping students determine how to analyse their market and test their product idea relative to the market. The artifact created in Week Two allows students to 'show-and-tell' their idea, which provides immediate feedback. The processes during these two weeks involve applied market research and competitive market analysis, all of which is done with little or no capital. Bootstrap funding defines their budget.

The results of the market analysis take until Week Four to complete and are discussed at that time. The professor facilitates the discussion and uses students to help model other market data opportunities. As a group and class, we discuss what can be done to change the market approach based on market information. Students often decide to change product components, markets and packaging during these two weeks.

Week 5—Meeting the Board and Mentors

With the story created and the market understood, it is time to meet the Board. Week Five includes a group meeting with the student business team and the professor. The team is responsible for making an investor pitch using a ten-piece PowerPoint slide set that should last no more than 20 minutes (including time for question and answers). This pitch is viewed as a preliminary and informal board meeting prior to presenting their idea to a panel of VCs for funding (in Week Six). The team decides on the presenter(s) and tone, but each set of slides is modelled on Kawasaki's approach, who suggests using only ten slides for the presentation (refer to Figure 1 for descriptions of each slide).

Slide	Description
Title Page	Organization name; your name and title and contact information
Problem	Describe the pain that you're alleviating. The goal is to bet everyone nodding and "buying in."
Solution	Explain how you alleviate this pain and the meaning that you make. Ensure that the audience clearly understands that you sell and your value proposition.
Business Model	Explain how you make money; who pays you, your channels of distribution, and your gross margins
Underlying Magic	Describe the technology, secret sauce, or magic behind your product or service
Marketing and Sales	Explain how you are going to reach your customer and your marketing leverage points.
Competition	Provide a complete view of the competitive landscape. Too much is better than too little.
Management Team	Describe the Key players of your management team, board of directors, and board of advisors and as well as your major investors.
Financial projections and Key Metrics	Provide a five-year forecast containing not only dollars but also key metrics, such as number of customers and conversion rates.
Current Status (Accomplishments, Timelines, Use of Funds)	Explained the current status of your product of service, what the near future looks like and how you'll use the money you're trying to raise.

Figure 1. Description of each presentation slide (Kawasaki, 2004)

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Introducing a Science Laboratory Experience for Students of All Disciplines

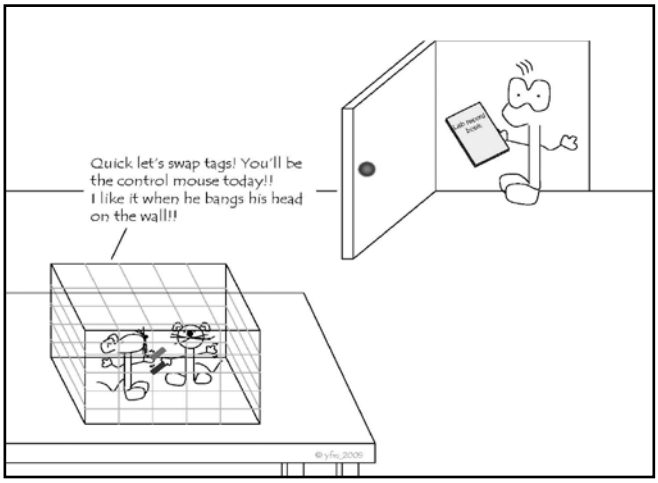
Associate Professor Tang Bor Luen and **Assistant Professor Yeong Foong May**
Department of Biochemistry

Laboratory work is an essential part of the curriculum of most, if not all, science courses. Appropriately designed laboratory exercises and experiments not only teach students technical and operational skills that are central to the manipulation of subject matters of interest in the sciences, they also impart skills such as problem-solving logic and troubleshooting know-how. Traditionally, however, laboratory training is largely associated with majors in the physical and life sciences. Engineering and medicine courses entail less laboratory work, while arts, humanities and business students often have little or no idea what a laboratory is like. These students may, however, be missing an important, if not critical, aspect of undergraduate education. An exposure to appropriate or relevant science laboratory work, at different depths depending on their discipline, could be beneficial to all students. A science laboratory experience would enable students to cultivate logical and explorative mindsets, and inculcate them with a passion for active independent learning and a problem-solving mentality. It also broadens their horizons and can profoundly influence their career choices and development.

An exposure to laboratory practices for non-science undergraduates may be useful at several levels. For instance, students could be introduced to the concept of a testable hypothesis as a key tenet in scientific pursuits as they conduct experiments in the lab. Their experiments could yield results that may support or nullify a particular hypothesis, and the skills needed to assess the validity of their experimental results and to interpret the data would teach them about critical thinking, based on data generated directly from their experiments. This skill may become useful in their daily lives as they learn to judge more critically any claims they may encounter in advertisements for health products, medications or other kinds of products. Also, the laboratory experience could debunk common misconceptions non-science undergraduates may have about modern science and technology.

Furthermore, one important aspect of laboratory work that is particularly good for training young minds is that it takes students away from the comfort of the classroom environment, where facts and rules have been passively laid down and where situations and events are only simulations at best. In the laboratory, every aspect of education becomes more dynamic, challenging and closer to real life. Science students would attest to the fact that experiments do not work out perfectly most of the time, and finding out what and why things went wrong could, in retrospect, be more illuminating. In the laboratory, the ability to think logically, critically and adventurously becomes more important than simply being able to apply one's lecture materials. Student soon realise that textbook knowledge is simply not enough and would be encouraged to explore for answers, or even define the questions, on their own.

Among the traditional non-laboratory courses likely to benefit the most from well-designed science laboratory modules is judicial studies (Arwood, 2004). Students of criminal law would be intrigued by Crime Scene Investigation (CSI)-styled laboratory sessions, where they are guided through the investigative identification of crime scene clues using standard reagents and equipment that can be adapted from existing life sciences and chemistry laboratories. Students of patent laws would also benefit greatly from doing a minor in a science subject with a laboratory module, as a well-designed laboratory course will allow them to better understand the process of scientific discovery that leads to patentable ideas or materials. Likewise, business school students on technopreneurship courses would



The lighter side of laboratory sessions. (Cartoon illustration by A/P Yeong Foong May)

benefit from an experience that captures what happens in the upstream portion of a mock laboratory-to-market situation.

Even arts and humanities students could benefit from a stint in a science laboratory. An important question to pose to history majors would be, "How did we come to know the science we know today?" An exposure to classic experiments in the life and physical sciences would impress upon students how important breakthroughs in science were made in the laboratories, either serendipitously or through sheer hard work. Such exposure would also be relevant to those who major in philosophy (particularly studies in epistemology) and social sciences (especially science and technology studies).

For courses which traditionally have a minor laboratory component, we advocate incorporating a structured and lengthy research module that is laboratory-based. A good example would be undergraduate medical education. Universities with undergraduate medical programmes should strive to match the American medical schools' system which admits college graduates, many of whom already have a basic degree in a life sciences-related discipline and have been exposed to laboratory courses and laboratory-based research. This is especially critical if we are to produce more clinician-scientists to fill the upper-level manpower void in the local biomedical industry (Solomon et al., 2003).

In NUS, students in the arts, humanities and business faculties do take cross-faculty general education science modules. However, these modules usually do not have a laboratory component. Assuming one is convinced that an exposure to science laboratory work would be beneficial to non-science majors and should be incorporated into their undergraduate curriculum, the logistics may be less daunting that one would imagine. As alluded to earlier, facilities in existing life sciences and chemistry laboratories could be adapted for laboratory courses designed for non-science majors. All that is required is good coordination. Since the key aim is to introduce basic concepts in scientific methodology, the practicals can be designed to incorporate experiments dealing with first principles and fundamentals without relying on sophisticated and high-end equipment. This would ensure that such modules are conducted in a cost-effective manner and at the same time, avoid giving students the wrong idea that good scientific inquiry is overtly dependent on cutting-edge technology. In universities in the USA, laboratory sessions are in fact incorporated into freshman science courses for non-science majors. Alternatively, such a course may be introduced just before the final year (targeting relatively mature students), perhaps as a Special Term module so it does not affect final-year projects. One could well imagine that the instructors might also benefit from teaching laboratory science to non-science majors, and may enjoy it as much as the students themselves.

References

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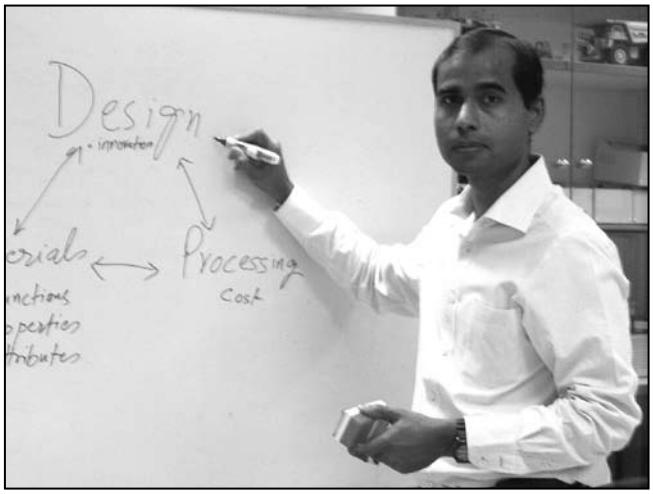
Encouraging Class Participation: A Personal Experience



Dr Sujeet K. Sinha
Department of Mechanical Engineering

Many lecturers would agree that students learn better when they are expected to participate in class as this stimulates their thinking process. Research has also shown that students learn better from their peers. A lecture is not just a time to take notes but an opportunity for students to contribute, learn and reinforce their own understanding of the subject through lively discussions. Although many university modules/courses assign marks for class participation (from 5% to as high as 40% of the module's total grade, depending on the type of module), these marks are often given for attendance, submission of home assignments or participation in online discussions on the universities' e-learning platforms (e.g. the Integrated Virtual Learning Environment (IVLE) discussion forums at NUS), instead of the actual discussion that takes place during class.

For the actual discussion, the lecturer teaching a small class would usually be able to remember who participated and easily make a record of it. There are other examples where the lecturer or his assistant would immediately record the student's participation in the class discussion. The former method may be applicable to a class of 20 students or less, but is not possible if the class size is more than 20, as the lecturer may not remember who participated. The latter method of recording class participation may give students the impression that they are being graded in the class and the recording process may also interrupt the flow of the ongoing discussion. In some lectures, the lecturer tosses a Koosh ball to a student when he/she participates in the class and when the lecture ends, all students who participated would bring the balls to the lecturer and record their names on a register (Robinson, 2008). This minimises interruption during the class discussion. However, throwing Koosh balls across a lecture theatre can also be distracting. Moreover, the lecturer has to be ready with many Koosh balls for each lecture if the discussion becomes intense. According to Robinson's (2008) survey, students liked the idea of using Koosh balls. Some other approaches use IT gadgets where the lecturer asks the class a question and the students answer using handheld electronic devices (Scantron Corporation, 23 January, 2008). However, the disadvantages of using such tools is that first, they place too much emphasis on technology and second, they can at best be used only for 'yes and no' type of questions, which do not constitute proper class participation.

The idea of class participation is practiced more in business, law or other humanities subjects than in engineering. One belief is that engineering subjects, which involve mathematics and data, are very factual and theory-oriented, and hence there is little scope for discussion. Having studied two disciplines (Engineering and Business), I can see the difference in their pedagogical approaches. In business education, most modules adopt a problem-based learning approach where case studies are used, which the class discusses before the lecturer teaches related theories and provides insights gleaned from his/her research or own practical experiences. In engineering, my experience has been that, except for some design- or problem-based modules, theory and concepts (content) are given precedence over discussion. As the engineering syllabus is often vast, there is little time left for any discussion. Most discussions are postponed to after-class meetings between some students and the lecturer, which may not include the entire lecture.

In my early days at NUS, I tried to introduce written or video-based engineering case studies, and encouraged students to participate in class discussions and make short presentations. However, except for a few very enthusiastic students, I did not

receive as much participation in the discussion as I wished. From this early experience, it was clear that students would participate in class only if it contributes towards their final grades. However, giving credit to students for class participation was not an easy task as my modules comprised 120–140 students. As mentioned earlier, the methods for grading student participation in large classes involve too much technology and lose the human touch (no real live discussion), or disturbs the discussion's flow or worse, give students the impression that they are being graded on the discussion.

To solve this problem, I used the IVLE's Assessment tool as a logbook. This tool makes it possible to set essay-style questions where students can write their responses in a text window rather than select their answers from the given choices. After writing, students press the 'Submit' button and their entries are saved in the IVLE's central database which only the lecturer has access to. An example is provided in Figure 1, where I ask students to record their experiences regarding their participation during the class, which they can do any time within the next two working days after the lecture. When I read these online logbook entries, I can easily remember which student participated or not. If necessary, I can also browse the student's class roster photo to ensure that he/she was not simply adding incorrect information or worse, cheating. It is also not possible for two students to record the same class participation, which I can verify using the photos. In fact, this method of recording class participation has been effective in preventing cheating or over-claiming by any student because when I read the entries, I can easily associate a discussion point to the student who participated. Also, by using this method, the onus is on the student to record his/her own class participation. In the Assessment tool, one student can make any number of entries throughout the semester, which I continuously verify two days after every lecture. All the entries remain stored in the IVLE database and can be used for evaluating each student's level and quality of participation and for grading the continuous assessment.

I usually assign 5% of the module's total marks for class participation, which includes discussions and short class presentations by students. Any additional work such as home assignments may also be included in the total grade for class participation. Giving very small credit for class participation ensures that students make a voluntary effort in contributing to the class.

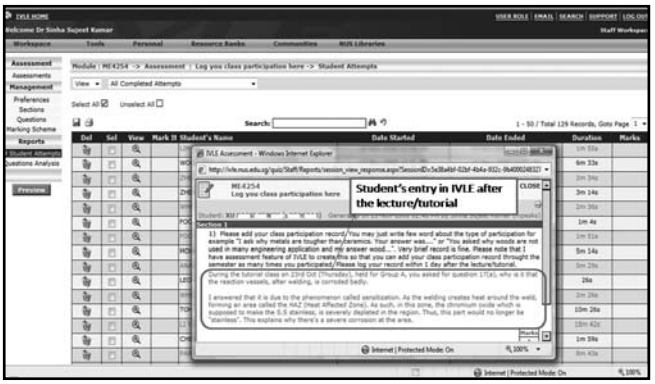


Figure 1. Screenshot of the class participation record of a student provided after the lecture.

Also, there is less chance of only a few students participating most of the time. Since the class is very large, justifiably, some students may not have the opportunity to participate during the lecture. Therefore, I also include participation in IVLE discussion forums within this 5% class participation grade, which gives students, who were unable to participate during the lecture, the opportunity to discuss the topic online afterwards.

After trying this method for several academic years, I surveyed my students who recently graduated after their exams results were released. The survey showed that all my students liked the idea of class participation if they were credited with some marks or bonus points for their effort. The survey also shows that giving some percentage of the module's total marks to class participation is generally practiced in the humanities or business modules but less so in engineering modules. I believe that using the IVLE Assessment tool as a class participation logbook eliminates the problem of grading these activities, which enables the lecturer and students to fully focus on the classroom discussion and not be disturbed by the logistics of recording class participation. A good classroom discussion among their peers will enhance our students' learning experience.

Below are some of the comments given by my students through the NUS student feedback survey conducted before the exams and through my own survey conducted after the exam results were announced:

- "I believe that student participation is very important in helping students to learn actively, as it is a common phenomenon in local universities for students to refrain from participating. While it might seem a little coerced [coercing] when…marks are awarded for participation, I believe it encourages students to ask questions and contribute to some

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TLHE 2008 Frontiers in Higher Education

CDTL's fifth International Conference on Teaching and Learning in Higher Education was held on **3–5 December 2008** at the Auditorium of Prince George's Park Residences. Participants spent three days engaged in lively debate and exchanged ideas, insights and experiences over a range of teaching and learning topics, including teaching methodologies, quality control in higher education and the most effective ways to assess student learning. Feedback from the conference was positive and encouraging, with many participants exchanging contact information with their peers so as to continue their discussions beyond this event. ■

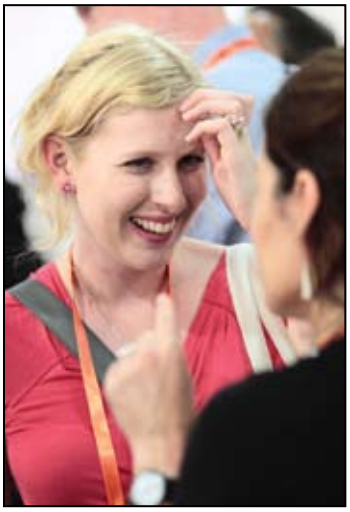
Keynote Speakers for TLHE 2008: Professor Tan Eng Chye, Deputy President (Academic Affairs) & Provost, and Professor Graham Gibbs, Visiting Professor, Oxford Brookes University & Former Director of the Oxford Learning Institute at the University of Oxford

A/P Chng Huang Hoon, Director, CDTL and Co-Chair for TLHE 2008, delivers the welcome address

Mr Andreas Dewanto of the Department of Physics shows conference participants the interactive demonstrations used to teach the subject

Invited Speaker Professor Keith Trigwell, Director of the Institute for Teaching & Learning, University of Sydney

A/P Daphne Pan, Co-Chair for TLHE 2008



Local and foreign participants in discussion after the presentations

Over 200 participants from 19 countries participated in this year's conference

There was lively debate and discussion amongst participants throughout the conference

Calling All Writers

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

- CDTLink (700 words maximum per article; photos & illustrations in hard/digital copy are welcomed)
- CDTL *Brief* (text-only publication; 1,000 words maximum per article)

To submit articles for consideration or to obtain more information, please contact: Liew Shin Dee
email: cdtlsd@nus.edu.sg • Tel: (65)-6516 4692 • Fax: (65)-6777 0342

Vice Provost Student Dialogue Series

In an effort to reach out to students, the first session of CDTL's Vice Provost Student Dialogue Series was held on 17 October 2008 to let students share their personal experiences at NUS. Twenty-five students attended the session and discussed issues such as the stress level at NUS, student diversity, class size and academics who are too wrapped up in their research rather than teaching. A third-year student recounted his overseas exchange experience in the US and expressed hope that NUS would experiment with less exam-centric methods. A second session was held on 17 November 2008 with polytechnic graduates who have been admitted to the Faculty of Engineering to pursue their degrees.

CDTL would like to thank Professor Tan Thiam Soon, Vice Provost (Education) as well as Associate Professors John Richardson, Ashraf Kassim, Chua Tin Chiu, Daphne Pan and Chng Huang Hoon for their presence at the session. ■

Professor Tan Thiam Soon, Vice Provost (Education), addressing the students during the session

Student participants listen attentively to the issues being discussed at the session

Farewell to A/P Daphne Pan

CDTL bids farewell to Associate Professor Daphne Pan, who steps down as Director after 13 years. The CDTL team has been extremely privileged to have been under her leadership, during which she spearheaded several key initiatives and programmes, such as the PDP-T and TA programmes as well as the TLHE conference series, all of which have greatly enhanced the pedagogical landscape in NUS.

Prof Pan returns to teaching and research at the Department of English Language and Literature, and will also continue to be involved in CDTL in an advisory capacity. We wish her every success in her endeavours. ■

Welcome!

CDTL welcomes

- **Dr Wu Siew Mei**, our new Deputy Director (Programme and Research) who joined CDTL in January 2009, and
- **Mr Stan Soh Shanji**, who joined our team in September 2008 as a Specialist Associate. ■

Writing Interactive Digital Stories as Projects

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Creating an interactive story is, in many ways, more similar to writing a play than writing a short story. In a play, the bulk of the playwright's effort goes into creating the plot, theme and composing the dialogue and interaction between the characters. Scene descriptions are expressed simply as pictures, without the need for elegant prose. The library that comes with Captivate™ helps provide some of these background resources. To some students, the creative mechanism of interactive stories, which contain visual and sound aspects, was better suited to their capabilities.

In the end, twelve teams submitted branching stories with topics such as "ICT Crime" and "ICT Dilemma in the Workplace", with scenarios on privacy intrusion, discovering pornographic material, losing one's password over social networks, and intelligent robots replacing human workers. Most teams were able to incorporate their lesson materials with quizzes and games. Some teams went further, and included animations and videos. Figures 1 and 2 showcase examples of the students' creativity in crafting these stories.

It was time-consuming to grade the projects. While some criteria such as ease of navigation, learning values, and interactive features, were developed to facilitate marking the story, each

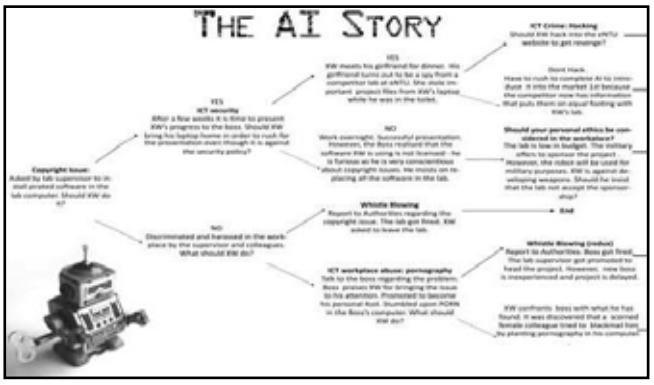

Figure 3. Example of the branches in a story

graded component requires me to play-test every submission. The result was that each story required many hours to grade. To uncover all the subtleties of the story, each branch of the story (See Figure 3) has to be explored. Nonetheless, it provides students with an invaluable method of understanding how ICT issues affect daily life.

Six of the stories can be found in the SOC website at:

- http://www.comp.nus.edu.sg/~cs1105/BranchingStories/1C/
- http://www.comp.nus.edu.sg/~cs1105/BranchingStories/1D/
- http://www.comp.nus.edu.sg/~cs1105/BranchingStories/2C/
- http://www.comp.nus.edu.sg/~cs1105/BranchingStories/5A/
- http://www.comp.nus.edu.sg/~cs1105/BranchingStories/6C/
- http://www.comp.nus.edu.sg/~cs1105/BranchingStories/6D/ ■

Encouraging Class Participation: A Personal Experience

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extent which is...a means to help inculcate this active learning environment."

- "Mutual learning amongst the student encourage[s] the students [to] learn more. Students would not take initiative to contribute without CA (class assessment) marks for class participation. Students will always [try] to find different answers for a question in order to earn the CA marks. So, I strongly believe that CA marks will improve the quality of the class participation. I think your method of awarding the CA marks to class participation is quite reasonable. The weightage for the class participation is good also."
- "Yes, I think class participation is good! Everything in life that happens adds to our experience, hence also to our memory. This is especially important in a short-time study period of 3 months in an educational institution like NUS. All that [we] accumulated will prove its worth when the time comes."

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Scantron Corporation (January 23, 2008). New, innovative Engage Response System encourages class participation, boosts achievement. Press release. http://datamanagement.scantron.com/news/08-01-23.htm. Last accessed: November 14, 2008.

Endnote

This method is equally applicable to modules from all faculties. The author would be glad to help NUS colleagues to implement this system of recording and grading class participation using IVLE. He can be contacted at mpesks@nus.edu.sg. ■

Using an Electronic Classroom Response System to Facilitate Quizzes, Activities and Games (QAG) in a Large Class Scenario

Dr Peter A. Todd
Department of Biological Sciences

One of the fundamental drawbacks of teaching large classes is the reduced opportunity for discussion and interaction with students (Hodson et al., 2002; Nicol & Boyle, 2003). This is a result of several interrelated issues including: students being afraid to speak up in front of so many people, making sure everybody can hear the discussion, and keeping attention up and noise (chatter) levels down. These issues are familiar to NUS lecturers and periodically, ideas on how to overcome them are proposed (Yong, 2005; Ng, 2006). One potential resolution is the use of an electronic classroom response system, known as the Classroom Performance System (CPS), that employs wireless handsets provided to individual students or small groups so that they can respond instantaneously to questions posed by the lecturer (Nicol & Boyle, 2003; Beatty et al., 2006). Results are provided in graph format using software that is compatible with Microsoft PowerPoint (http://www.cit.nus.edu.sg/response/). The advantages of this system include high student participation, anonymity (even shy students can have their 'say') and immediate feedback for both lecturer and student (when the results and correct answers are displayed).

I regularly use quizzes, activities and games (QAG) in small group teaching (Todd, 2005; Todd, 2007) but to date, have been unable to conduct any sort of competition with large classes in a lecture theatre. Conducting QAG in large classes is hampered by problems such as difficulty in organising workable teams, discerning which student responds first (e.g. when conducting 'first correct answer' type of quizzes), and ensuring all members of a team are involved. I hoped CPS would help me overcome these issues as it automatically records answers and all students should have an opportunity to participate. Projected educational outcomes include increased interaction, higher levels of participation, topic revision and greater general interest in the lecture by making it more fun.

The participating class was LSM1103 "Biodiversity", a large (315 students) first-year introductory module. As the assigned lecture theatre had three seating sections where the two side blocks comprised approximately the same number of seats as the centre block, I created two large teams: the centre block (team name 'The middle way') versus the two side blocks (team name 'On the side'). The 100 CPS handsets provided by the NUS Centre for Instructional Technology (CIT) were equally divided between the two teams so that the units were shared among (more or less) groups of three students. The technology seemed to appeal to students and they quickly learnt how to use the handsets.

The CPS software was reasonably easy to operate, with the software's onscreen buttons appearing below the PowerPoint slides. The greatest problem I faced using the CPS to conduct team-based quizzes was that it will not allow the creation of teams! When I posed a question with three possible correct answers (e.g. A, B or C), there was no way to display the number (or percentage) of correct answers each team gave. As each handset unit was numbered, I was expecting to be able to instruct the programme that units 1 to 50 would be team X and 51 to 100 would be team Y. However, the CPS is designed to facilitate feedback from the whole class, not subdivisions, and therefore it will only display a results graph for the entire class. I had to 'shoehorn' the system to my needs by explaining to the students that for the same question, one team was to answer A, B

How many of the world's biodiversity hotspots are in SE Asia?

A) 4 B) 6 C) 8

Figure 1. Example of the slide with questions for team 'The middle way'

How many of the world's biodiversity hotspots are in SE Asia?

D) 4 E) 6 F) 8

Figure 2. Example of the slide with questions for team 'On the side'

or C, whereas the other had to answer D, E or F. Figures 1 and 2 show two examples of the slides.

This approach worked, but was far from ideal as both the students and myself had to concentrate on the scoring system. During the next lecture, I simplified the structure to 'true or false' so that for team 'The middle way', true was 'A' and false was 'B', whereas for team 'On the side', true was 'C' and false was 'D'. As this was a more effective arrangement, I used it for the final two lectures. Of course, this arrangement still gave one team the opportunity to sabotage the other. For instance, based on the 'true or false' example (and imagine 'true' was the correct answer), members of team 'On the side' could press 'B' and therefore boost the number of incorrect responses registered for team 'The middle way'. Although such manipulation was generally easy to detect (i.e. there were no longer 50 responses from each team), there was nothing that could be done to fix the problem except to ask the students to play fair. Fortunately, my class only identified (and exploited) this loophole in the fourth and last lecture, to much hilarity!

There were two steps to getting the results up on screen. The first was to ensure that the entire class had entered their answers, and I found a 5-second countdown helped speed things up. As each unit is numbered, it is possible to identify those who have yet to respond and encourage them with a comment like "come on number 18, you can do it!" After the students have done their part, the system takes between 5–10 seconds to register and present the results of all 100 units, which can feel slow when the quiz is meant to be rapid fire. The time can be filled by a routine remark such as: "So, what was the right answer?"—wait for students to shout out their responses—"Yes, that's right, now let's see which team has the most correct responses", by which time the graph should have appeared.

Although students responded well to seeing their team win a point, true team spirit was difficult to cultivate. This is perhaps unsurprising with more than 150 members to a team and the competition running over just four lectures. Being such a large class, many students had to leave relatively early for other lectures. Whereas some might have felt compelled to stay if my lecture ran slightly over time, I found out during the first quiz that they had no qualms leaving during QAG, and I had to make sure there was enough time to finish in subsequent classes. Due to the large class size, it was also hard to ensure all students had put their notes away before we started, but the fact that they had to respond to the questions quickly resolved this particular obstacle.

Overall, the majority of students seemed to appreciate the quizzes as a break from my regular lecturing. Apart from the issues raised earlier, there were no major hiccups and all the handsets were returned without having to have them signed in and out. It is worth noting that although it would have been ideal if each student had a unit to ensure total participation, it would be logistically challenging to distribute and collect them. Each team won two quizzes, an equanimous finish, and after the last quiz I used the CPS to ask the following three feedback questions:

Were the quizzes difficult or easy?	Difficult = 6.8% Easy = 18.2% Not difficult, not easy = 75%
Did the quizzes help you remember information from the lectures?	Usually = 21.5 % Sometimes = 62.4% Not at all = 16.1%
Did you enjoy the quizzes?	No = 8.7% Yes = 56.5% They were OK = 34.8%

Figure 3. Feedback questions on QAG

The responses to these questions appear encouraging in that the quizzes were not too easy and helped most students remember information from the lectures. This latter point is supported by comments in the official Student Feedback Report, such as QAG was "…a good method of helping students to remember the content of the current lecture as well as recap the content from previous lectures." and "I think the idea of having quizzes is great, it makes me recall facts I would have otherwise forgotten...makes learning fun, which is always good." I could have asked whether the QAG helped students understand the subject, but

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Empowering Students to Learn

Mdm Peggie Chan
Centre for English Language Communication

On ES2007D "Professional Communication", a course offered by CELC to students from the School of Design and Environment, students take over the 'teaching' of one topic of the course. Instead of being taught the principles and strategies of oral presentations (a major topic of the course), students research aspects of the topic and in teams, peer 'teach' an aspect assigned to them. The instructor takes a step back, becomes part of the audience and is responsible only for correcting factual and language errors.

Here are the reasons for adopting this approach:

a. Students typically suffer from 'lecture lethargy' resulting from years of attending lectures.
b. Students are more involved in the learning materials if they have a hand in developing it.
c. Students are capable of learning independently.

In groups, students are given two weeks to research a sub-topic assigned (e.g. Principles and Strategies of Team Presentations). To make it challenging, I require that each group is asked questions by other groups as well as by me. In this way, I ensure that students are responsible for the following:

- Understanding that a premium is placed on their 'teaching' each other.
- Being thorough and organised, and ensuring facts need to be accurate and clearly presented, since they are 'teaching' the topic.
- Learning to listen attentively while others present, so as to ask questions.

After each group's presentation, I critique their coverage of materials, the application of the principles they 'taught' (this is very pertinent given the topic presented), and the audio-visual aids used (e.g. Powerpoint slides, videos). The last is done to ensure that factual and language errors are corrected, before the slides are uploaded on to the class workbin on IVLE for others to refer to and learn from.

I have observed these outcomes:

a. Students welcome the opportunity to take on the role of 'teaching' their peers—there is always excitement when the task is assigned, even if they foresee the amount of work involved.
b. Students take responsibility for their own learning—the onus is on them to learn it well enough to be able to 'teach' it to themselves and to others.
c. The output is tremendous—the teaching set of slides assigned to instructors consists of 16 slides whereas the students produced six sets (six sub-topics were set), totalling 178 slides. Numerically, the difference is already significant, what more the length, breadth and width of coverage students were able to give to the treatment of each sub-topic researched. Given that there are many strategies, tips and methods to learn, the depth which each aspect is given (in the way each group is given an aspect to deal with) is far better than the broad sweep the instructors' set of teaching slides gives. Not only are the slides comprehensive, the presentation is usually very creative, incorporating multimedia such as video clips and YouTube snippets illustrating the aspect 'taught'.
d. Students gain confidence about self-learning from the exercise, which makes them realise that they are capable of learning the topic themselves, from the responsibility given them and from doing it in a group.
e. Students apply what they learn—they practise the very skills they 'teach' their peers, in this case presentation skills, including the use of visual aids, non-verbal language (body language) and team presentation strategies. Additionally, this is an ideal opportunity for them to practice for their next assignment, which requires them to present a proposal plan orally.

f. The group work empowers them—it gives them a sense of mutual accountability and is an important stepping stone to the group work they do more extensively later in the course.

g. The exercise gives them the opportunity to practise time management, resolve conflicts, and deliver a presentation, given constraints like limited time to do research and deliver their presentation (15–20 minutes), which are all important skills for the working world.

To obtain feedback on the exercise, a survey was administered to students and instructors. The results (responses from 161 students and six instructors) are as follows:

- The benefit most valued by students is the opportunity to work in a group.
- The benefit most valued by instructors is the opportunity for independent learning.
- The most prominent difficulty pointed out by students is coming together to complete the assignment.
- Instructors do not feel they are letting go of the 'sage-on-stage' role.
- Instructors' responses on other topics that might be peer taught show that some topics clearly lend themselves to this method of learning (e.g. conflict resolution) while others simply do not (e.g. reports and interpretation of data).

When we empower students to learn, we equip and raise their confidence so they learn better. They value being involved, being a 'shareholder' (Freiberg & Driscoll, 1996) and they practice independent learning. Empowerment is key to allowing students to take charge of what they learn and motivates them to discover facts on their own.

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Using an Electronic Classroom Response System to Facilitate Quizzes, Activities and Games (QAG) in a Large Class Scenario

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past experience (Todd, 2005; Todd, 2007) suggests that such quizzes are best used as revision tools, and that one should not expect too much in terms of higher learning. Unfortunately, I did not have the opportunity to interview individual students to determine why only 56.5% replied "yes" to "Did you enjoy the quizzes?"

In conclusion, although I think the CPS has a future role to play in large class QAG, I would be reluctant to use it again until it is easier to present the results for individual teams.

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Difficult Conversations: Turning Taboo Topics that Polite People Avoid into Pedagogical Occasions

Dr Tan Seow Hon
Faculty of Law

Anyone with reasonable social skills in today's pluralist world is well aware of the hot-button issues to avoid in conversations. Topics which polite people avoid, some of which are known in America as the 'culture war' issues—of sexual orientation, abortion, moral values, religion in the public square and so on—threaten to turn a nice social setting into a minefield.

The threat is as real in the university setting, notwithstanding the common belief that students are apathetic. This is unsurprising, given the recent buzz in the blogosphere over the government's decision to retain Section 377A of the Singapore Penal Code which criminalises acts of gross indecency between males.

When a hot-button issue is raised, often, everyone has a view. I have observed four interesting aspects of the phenomenon regarding such debate. First, whether one has really thought through the various points of view, many have gut reactions and consider themselves to be in one camp or the other. Second, each camp views the other with suspicion. Sometimes, the attacks are personal and visceral. Third, they tend to have a low tolerance for fence-sitters, who are frequently pressurised by both camps to take sides. Finally, many become overnight experts in fields they are, if we think about it, not really qualified to comment on—for example, politicians are asked to comment on science, pastors on law, atheists on the interpretation of religious texts, scientists on sociology and so on.

Against this backdrop, I run two courses in the Faculty of Law—a first-year core module LC1002B "Introduction to Legal Theory" and an upper year elective LL4404/LL5404/LL6404 "Jurisprudence"—during which I engage these topics in classroom and online IVLE discussions. Both courses concern the philosophy of law and require students to explore law's relation with politics, morality, justice, power and other social phenomena. Philosophical courses conducted in a professional school in Singapore's pragmatic setting, unsurprisingly, are challenged with doubts about their utility and anxiety over their level of abstraction. Even the upper year elective's course title often has students asking, "Juris-what? What's that?"

To counter the low expectations of some students, I have learnt to embrace the transformation of my classrooms into minefields. Taking off from these hot-button issues, I ask students to think about the proper justification for laws which restrict the freedom of individuals. Are laws that criminalise homosexual practices unsound, for example, as these acts harm no one? Can an individual consent to particular acts, and does society not have the right to prohibit certain behaviour as long as an individual consents? Do private acts have public repercussions? Must laws never enforce controversial moral norms? If so, why prohibit polygamy if it is not against the morals of some? Is the controversy over abortion best resolved by allowing abortion and leaving it to each pregnant woman to decide? After all, those

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who are anti-abortion are not forced to abort. But if so, why would such rhetoric be unacceptable in the case of slavery? What distinguishes the two issues? Are laws that require evil acts, such as racial persecution, considered laws just because they are passed by the legislature?

My experience has been that when theory is pegged to concrete situations, it is not regarded as highfalutin. When students react, I invite them to consider whether their responses are rational to another person who does not share the same moral viewpoint. They are also asked to consider if they embrace contradictory assumptions. For example, if they believe that right or wrong is a matter of each person's personal opinion, why would they consider it absolutely 'wrong' that another 'imposes' a view on them?

In the course of such discussions, students have been excited to read more as they are challenged to consider whether their viewpoints are defensible. Indeed, many have shared of how class discussions have been faithful companions on their bus journeys, conversations in the canteen and so on.

As I employ these topics over the years, I have found some tips helpful. First, I must assume that my students are not unreasonable persons, but sincerely hold their opinions. Some may change their minds, but throughout the discussion, it is important that they feel valued as individuals, especially when I disagree with them. Second, the teacher's role is not necessarily to teach a particular viewpoint, but to impart a passion for truth and a willingness to examine one's

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Educating Entrepreneurs—A Realistic Approach in a Complex World

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Week 6—Presentation to Venture Panel

The VCs and 'angel investors' from the area (in our case, Portland, Oregon) are invited to serve as panelists for the student pitch. As in the previous week, students decide on the presenter and tone, and have no more than 20 minutes to make their pitch. The panelists listen to the presentations and provide candid feedback regarding the feasability of funding the idea. Additionally, each panelist details to each group improvements they can make to enhance their financials, markets, plan and story. Students collect the feedback and integrate it into their final plan for Week Seven.

Week 7—Write and Deliver the Business Plan with a Debrief

Unlike most classes, the business plan is addressed in the last week. The plan is graded on how well the team integrated the feedback from the panel. The focus of the last night, however, is not on the plan but students' experiences over the seven weeks. A facilitated discussion opens the dialogue on how people felt. We discuss their experiences and feelings through the process. Did they feel more or less passionate about their product, service or project? Will they be more or less likely to implement their idea? What do they know about themselves, and being able to modify course, would they hire the right people, sell others on an idea, raise capital and learn from rejection? As such, the last class is a session for self-reflection. We also discuss the question that preoccupies students: When do you make the transition from an entrepreneurial-driven firm to a professionally managed company? When does the bootstrapping end?

Conclusion—Assessment of the Outcomes

Entrepreneurship is critical for our world. As professors, we must constantly assess the effectiveness of course activities to ensure students have skills and abilities rather than simply theoretical knowledge. This is especially true when educating entrepreneurs. We have used this new approach to entrepreneurship with three cohorts of students and have received positive responses from both students and panelists. As a reflection of its effectiveness, the course has also seen four successful business launches. Students complete the course feeling empowered to launch solutions that address the needs of the world.

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Difficult Conversations: Turning Taboo Topics that Polite People Avoid into Pedagogical Occasions

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The author (front row, fourth from the left) and students from her Jurisprudence class strike a lighthearted pose. She dedicates this article to this delightful group and hopes they will continue conversing.

viewpoint for incoherence. Students must be taught the difference between personal convictions and defensible opinions. Third, there is a subtle modeling that is constantly going on. More than substantive views, students are 'picking up', unbeknownst to them, a model of discoursing and relating. How should a person who disagrees be treated with dignity and respect? How should one express disagreement? What does it mean to speak with gentleness and to listen with humility? Fourth, I remember that there are persons in the discussion for whom the issues are not academic but personal. How would they feel as we talk about these issues? How could I demonstrate acceptance of each person?

Of course, human conversations are imperfect, and sensitivity and concern may not be received well when the disagreement over these issues is fundamental. Still, in a world where we are bound to disagree on some issues close to our hearts, an ancient proverb is a good start: "A gentle answer turns away wrath, but a harsh word stirs up anger. The tongue of the wise makes knowledge acceptable."[1]

Endnote

1. Proverbs 15:1–2a, New American Standard Bible (1977). ■

CDTL

The Centre for Development of Teaching and Learning (CDTL) provides a wide range of services and facilities to promote the teaching, learning and research programmes of the National University of Singapore. These include teaching and learning support, research on educational development issues, as well as instructional design and development.

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