



As the NUS student intake grows, it becomes increasingly imperative for teachers to hone and improve the effectiveness of their large-group teaching skills. Consequently, this issue of CDTL Brief looks at how to promote active learning through *Large-group Teaching*.

Keys to Effective Large-group Teaching

Associate Professor Tan Cheng Han

Dean, Faculty of Law

A/Prof Tan Cheng Han (TCH): Can I first ask what you would consider to be a large group?

Participant:* 400—That's the normal size of our classes.

Participant: More than 50.

Participant: More than 30.

Participant: More than 10.

Participant: It depends on different courses. 20 may be a large group for some of us.

TCH: I'm glad you raised that point. But can I ask, for the gentleman who said more than 10, why do you consider that the threshold size?

Participant: In our setting, it's difficult if there are more than 10 medical students examining 1 patient.

TCH: In the Medical Faculty where there is a lot of clinical work, I suppose it is hard to imagine 400 doctors and medical students congregating around one single patient. So for any clinical work in that context to be meaningful, the group may well have to be 10 or less.

Participant: I think more than 10 is considered large. If you have less than 10, you can have more active participation and discussion.

Participant: For practical considerations in my area (i.e. real estate), I don't need to have 10 or less. Our course is more practice oriented. We usually take a maximum of 50 from which we form smaller groups. In class, students gain a better perception of market reality (where a sale of land or property usually receives 10 to 15 tenders) when there are more sub-groups available to generate different approaches to solving set problems.

If you have a size of about 20, we can have at most about 4 or 5 groups. When students have 4 or 5 views, this may not reflect what really happens in the market.

Participant: The limit of 50 is not clear-cut; it's usually around 40, 30-plus. If you handle 50 students, you have good eye contact; you view all their facial expressions; you understand students better from how they react to you; you may also have enough time for after-class discussions. Above 50, this will be difficult. 50 is quite a reasonable size for general engineering classes. If under 10, that is a small group: you can interact more with students, discuss deeply and get individual views. With more than 50, that is impossible.

TCH: Good; 2 very important points. No. 1: more interaction. The quality of your interaction with the students increases the smaller the group is. No. 2: qualitative contact. You can spend more quality time with each individual student and get to know each better. The gentleman who said 400: can you explain your context?

This is an edited transcript of A/Prof Tan's lecture/discussion with participants of the Professional Development Programme session that CDTL conducted on 21 February 2001. Through this session, A/Prof Tan talked about some of his personal experiences of conducting large-group teaching as well as invited participants to share their own experiences and raise any questions that they may have.

* Responses are from different participants.

Participant: We have 2 formats of courses in Business. One is lecture and tutorial, normally with more than 400. The other is for the seminar courses with below 30. We usually have no choice and have to lecture to more than that.

TCH: It seems you are circumscribed somewhat by the circumstances you find yourself in and a lot depends on the course and what you intend to achieve ultimately. If you want better interaction for example, then obviously the larger the group, the less interaction you will have with each individual student. If you want more active participation, how do you get meaningful participation from each student in a class of 500 or 1000? It is not impossible. But clearly the larger the number, the more difficult it is to draw that out from the class. In the end, what is important is not so much the absolute number, but the quality of contact you can have with individual students to make them more interactive in the learning process. The larger the class size, the more difficult it is.

Now I want to ask you another question. Let us say that I am standing here this morning and just giving you a straight lecture. How long do you think you will listen to me before your concentration is broken either momentarily or for a longer period of time?

Participant: 30 to 45 minutes

Participant: 12 minutes.

Participant: It really depends on how interesting your talk is, how personally involved I am with the topic or material, and how exciting your presentation style is. Each person's attention span is different.

Participant: 40 minutes.

Participant: I've had very bad teachers before, so I can concentrate for 1 hour.

Participant: 10 to 15 minutes.

Participant: 20 minutes.

TCH: 20—This appears to be the more normative figure. Studies indeed have shown that generally a person's concentration span is about 10 to 15 minutes on average. I think all of us have at some point in time encountered really bad and boring teachers so that after 5 to 10 minutes, we switch off and we never switch back on again. I wonder if this happens when we lecture to our students too. These days, many of my students bring laptops into the lecture. And I often wonder whether

they are actually taking down what I'm saying or playing computer games or surfing, because occasionally I hear a funny beep coming from their computers. This is the reality now. What implications does it have for the traditional lecture where the lecturer stands in front of the class and expounds for 45 minutes at a stretch? I'd like you to take 5 minutes to think about it yourself or discuss it with your neighbour... (Pause) Now would anyone like to share anything arising from your own personal reflections?

...although we've said that the difference between a large group and a small group depends on the interactive nature of the class, this doesn't mean you cannot have interactive/active learning in the context of a large class.

Participant: Channel resistance increases with time.

TCH: Absolutely. Anything else?

Participant: You have to get students to participate. You could talk for 10 minutes; after that, you could create a change in the traditional lecture style and just speak directly with them. You ask them a question, get their participation and then move on again. I think you have to keep doing that.

TCH: That's a good point. Because of the short attention span of most students, you need, at some point in time, to draw them into the learning process as well: for example, by putting a question to them and asking them to think about it and discuss it amongst themselves.

At this juncture, I want to stress a point: although we've said that the difference between a large group and a small group depends on the interactive nature of the class, this doesn't mean you cannot have interactive/active learning in the context of a large class. In fact, it is vital to have some element of interactive/active learning as the traditional lecture itself is not terribly effective as a student's concentration span is not as long as we would like it to be.

Just because your students are taking down what you are saying, does that mean they are following you? You know how it is: they blank out and copy robotically. They are not thinking about what is being said because they are just concerned with capturing your words so that they can re-read them later. But if that is what a lecture is all about, isn't that an unproductive, unconstructive use of the 45 minutes that you have? If all you expect your students to do is to take down what it is that you are saying, won't that purpose be primarily served by giving them notes in advance? Obviously I agree that you can project what it is you are saying and if you can make it interesting it may inspire a certain passion in the subject. But that's only up to a point, right?

Participant: Then we're wasting our time.

TCH: Exactly. Are we really needed? What is that value that we can add to our students beyond what they can find in textbooks or if they go into a reputable site on the Internet?

Participant: Even in the traditional model, you can ask a question. You cannot ask a book a question, you cannot ask the Internet a question.

TCH: Agreed. But how many of your students will actually, during the lecture, put up their hands and say: "Sir, I don't quite understand that point", or "It doesn't quite match something I read somewhere. Could you please try to reconcile the two?" Generally, our students don't do this.

Participant: Probably none. They just don't take advantage of it. But I'm saying that it's there.

TCH: If we make it part and parcel of our lecture to encourage them to ask questions, and we make it very clear that questions are eminently welcome, then perhaps I agree. Unfortunately in a traditional setting, this is unlikely. An Engineering colleague once said to me: "We have real problems when we have small-group classes. You can pose questions to students and they refuse to say anything. It's like trying to extract blood out of stone." By implication, he was saying that Law lecturers are lucky. So I replied: "I'm sad to say that in the Law Faculty we also face the same problem although perhaps to a lesser degree." I was quite heartened when a visiting eminent Oxford Law professor said: "Your students here remind me a lot of Scottish students. When I teach in Scotland, many students refuse to say anything and you have to take great pains to draw them out." The cultural aspect is one thing. But we have to do what we can to encourage students and draw them out. OK, any other thoughts?

Participant: In previous days, some lecturers used to have problems: they would forget their train of thought when someone stands up and asks questions. These days with *PowerPoint*, we can always look back and see what we are going to say next. So you do not have as much anxiety or stress.

TCH: Let me take this up. Many people think that I'm quite comfortable lecturing. But I will never be so comfortable as to walk into a class without any sort of road map. For all of us, it is good teaching practice to

have a road map. You don't have to jot down everything in such great detail that you're reading from it. It is important to have a point here and there to remind you what it is you intend to cover.

Participant: In view of the lack of concentration, we should integrate both lecture and tutorial. Make the tutorial a follow-up of the lecture. Come up with controversial issues during the lecture and let the students think further for the tutorial if they are unable to answer then. Once you pose them some issues, their minds start to work and they will be more active.

Participant: All of us have seen examples of good lecturers who have a way of engaging the class. Perhaps they can get comfortable with however big the class is. And they do have a way of making it come alive in the way that they act out the lecture. It's not just verbal bombardment. It's also all the faculties that are involved in transmitting that knowledge. Even in a one-way transmission, they have found a way of using all forms of communicative means—tone of voice, pace, tempo, rhythm, musicality, body language, etc.—and that cannot obviously be obtained from paper, the Net or books. Maybe if you can webcast the lecture, it's possible. But still there is this dimension of reality that the students can get from even a traditional lecture format.

Participant: You complain of students not asking questions. But I have another experience. Once in China when I was teaching in a class of about 100 students, so many students wanted to ask questions that I couldn't control the situation. And the students complained they

had no opportunity to ask questions. So how many questions can we take in a large class?

TCH: Actually, that's a nice problem to have, compared to the usual. But I agree with you: you don't want a case where every minute or so someone is putting up a hand to ask a question. Obviously as you go along, you have to lay the ground rules. If it

is a question that arises out of what you have said in the lecture, fair enough. But it shouldn't be something that they may have been thinking from 2 lectures ago and they now want to raise that issue when you are actually talking about something else. So when it comes to things like this, you can say: "Why don't you ask me these questions after the class?" In other words, make yourself available as an alternative to answering all questions.

Participant: Maybe all the questions are relevant to the topic.

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TCH: In this context, you may have to think of restructuring some of your material because it may be that your material is raising a lot of very interesting questions and you may want to spend more time on some of these interesting issues and leave out other less controversial areas. Alternatively, you may need to integrate your lectures with your tutorials so that many of these issues can be discussed within the context of the tutorial.

Participant: I'm from Architecture and I'm not happy about the way lecture theatres are designed. Especially for my seminar classes, the way the seating is arranged actually puts you on the spot as a traditional lecturer and the students just sit there and listen. So do you have any suggestions in effecting good discussions in that sort of space?

TCH: Not being an architect myself, I haven't really thought about it. But I think you've raised a very good point: an appropriate seating arrangement can make it more conducive for interactive discussions to take place.

Prof K.P. Mohanan (Deputy Director, CDTL): Actually there is a committee looking at this problem for new LTs in the future and they are taking into consideration the various possible kinds of small-group interactions in large classes. They are designing lecture spaces in which people can turn around and form groups of 5 or 6.

Participant: There are some students who ask questions when we lecture. But the lecture theatres are large here, and even though there is a microphone, we can't hear what the students say when they sit at the back. What can we do?

TCH: It's a problem I must confess I'm not familiar with because in Law the largest class is probably no more than 200. If a student in the back of the class talks loudly enough, he/she can make himself/herself heard where I am. What I can suggest is this: you need to let students know that you welcome questions. So ask for microphones to be placed strategically at parts of the lecture hall. You can even have a couple of freestanding mikes that you know can be passed through the crowd to someone in the back if it is difficult for that person to reach the mikes. Even if no one uses the mikes that often, such arrangements signal to the crowd that you welcome questions.

Participant: As we change our methods of teaching and make the transition towards new styles of lecturing, how

can we stimulate active participation in students still used to the traditional format?

TCH: There are certain stylistic things you have to keep in mind when lecturing. For example, you should make eye contact. If you are looking elsewhere while talking to your students, they will think you are not interested in them and you'd rather be somewhere else. Yet you shouldn't make it too obvious, because you will distract them. Some people pace nervously up and down while talking and that can be disturbing. Some movement is good because if you stand still robotically, everyone will be sidetracked wondering when you will move next. Hand gestures can also be terribly distracting, depending on the context. Some people use hand gestures selectively to punctuate a point: there is some impact there because the hand gestures draw you back into the lecture. Varying the pace of your voice is important too. Some people speak in a monotonous tone all the time. After a while, all of us will switch off at least momentarily. So sometimes raising and lowering the pitch of your voice to emphasise a point is a good thing: it draws the audience back.

Use audio-visual aids to draw the audience's attention to something else aside from the speaker and break the monotony of only looking at and listening to the speaker only for 45 minutes at a stretch. By focusing on such aids, the audience can be drawn back into the lecture again. But you will notice, I am notorious for not using audio-visual aids. There are some people who prefer to emphasise the style of presentation. If you are comfortable with that, you may not need to use audio-visual aids quite as much. Also, be conscious of the dangers of using audio-visual aids: a senior colleague of mine said that in the very year she started to use PowerPoint, her student review grades went down through the floor. She was putting in so much effort to make the slides attractive that she omitted what ultimately makes for a good lecture. So think of how to present your material: that ultimately is more important than any audio-visual aid.

Ultimately, preparation is most vital. Preparation doesn't simply mean that I have all my notes here and so I can just come before you and start talking to you. It's also putting myself in the audience's shoes. Where are they coming from? What are their needs? What are they likely to feel confused about? Thinking through the material, how do I present this point? Should I use this analogy

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to buttress this confusing point? Should I link this with that other preceding principle that I talked about two weeks ago so that they can see the connection? Do I link this with some other subject so that they see how these subjects are also inter-related? By preparing, you not only have the subject matter there, but you also actually think of what you are doing. You have a plan.

In the US, many Law teachers teach using the Socratic method. They stand in front of the class and ask: "Have you read the case of A vs. B? Tell me what are the facts of that case." A student will reply. "What did this judge say?" Someone else will reply. "Do you agree with the judgement here? Are the reasons here consistent with the earlier Supreme Court decision of C vs. D?" The whole lecture is conducted this way. It is not really a straight lecture; but it's very interactive and the students learn from each other. At the end, the students will have to draw from what has been discussed and learn from it. One of my colleagues, who studied at a top US law school, came back to NUS and tried this method. It failed miserably, although I thought it was a very good attempt.

So first, you must think about your audience. Second, if you want to make classes more interactive, you've got to slowly ease students into it. You must explain to them: "Look, I am doing this because this is what I want to achieve. I think this will be good for you." Sometimes we don't tell the class and we expect them to just fall in line and understand what we are doing. They don't necessarily.

To address the question posed tangentially, my style of teaching is not very traditional. Many Law teachers will stand in front of class and set out the cases—very organised, beautifully done. That delivery can inspire people to want to know more about the subject and there is nothing necessarily wrong with this method. But I don't teach at all in that way. I say to students: "As you are all in Law School, I assume that you can read English as well as I can. Therefore I can leave you to read much of the primary material yourself. But I will help you: I will give you a fairly good reading list so you know what are the things that you ought to look at. But I am not going to hold your hand and bring you through every principle that you can get from reading a book. What I intend to do is focus on difficult areas and topical matters. I will put questions to you that I want you to think about and these issues can be discussed in tutorials." I make them think about it. Sometimes, I share my own thoughts with them. I tell them: "Look, this is

my view. But others have taken different views. So don't take my view as the gospel truth. Instead, reflect upon it and formulate your own thoughts. Also, read the views of other academic commentators." Or sometimes I pose questions to students and ask them to think about an issue; I may make them take a break and discuss the issue with their neighbours. Then I'll ask them for their views; I'll take an occasional poll: "How many of you think the result was right?" This makes them active participants in the learning process.

I think you too can do these things in a large group. But especially for new teachers, go slower. When I was a younger lecturer, I would concentrate a lot on the

stylistic part and I made sure I knew my material well. Those are your initial concerns and it is understandable if in the first year or so you want to concentrate on that. As you become more experienced, try to go beyond that. Try to use a lecture as a forum where you can draw students out. Ultimately when you make them active participants, you are, as the saying goes, teaching people to fish, to find their food, rather than giving it to them. When they leave the University, you will not be there to hold their hands, so they've got to find their own feet. And you've got to start helping them when they are in NUS to do this.

Let me make a few more points. First, it is very important to be natural. When I give a class, I try to speak as conversationally as possible to my students. There's no need to stand in front to them, assume the mantle of some learned guru and speak in an authoritative manner. Just be yourself. When you talk to your friends, I'm sure you speak quite naturally and in a very animated form. If you can reproduce that for your classes, I think you will be very successful because people will relate and react to that.

Second, try to connect with your students. I always let my students know subtly that I am concerned about them. This is why I often ask them: "Do you have any questions? If you have any questions, don't hesitate to put up your hands." When someone asks a question, I usually will say at the end I think that is an excellent question, I'm glad you raised it and I will deal with it. You need to affirm your students because people are very shy. Someone who raises his/her hand in a class of 800 risks being thought a fool. Whether the question is foolish or not, I don't care. I give credit to the person who is prepared to ask. I also tell my students: "I'm

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Maximising the Effectiveness of Large-group Teaching: A Few Practical Suggestions

Associate Professor Malcolm H. Murfett

Department of History

and

Mrs Ulrike M. Murfett

Tutor, Centre for English Language Communication, NUS
& Nanyang Business School, Nanyang Technological University

For the purposes of this article, large-group teaching is defined as giving tutorials to classes of more than 20 students. The main risk of teaching such large groups is that individual student-teacher interaction, a hallmark of good tutorials, is reduced to such a level that the tutorial begins to look like a mini-lecture. If this were to happen, then students lose out on an important element of their academic development—the generation and exchange of ideas, and the intelligent use of information. Given the fact that large-group teaching is increasingly becoming an integral part of the teaching process at NUS, what can be done to minimise this danger?

Several factors that have emerged as being of critical importance in ensuring a varied and enriching tutorial experience for large classes are as follows:

1. Working in small groups

When a teacher is faced with a large tutorial class, his or her main challenge is to ensure that individual members of this class remain engaged in the learning process and do not switch off halfway through the tutorial. In smaller classes, this would not be such a problem as students go into tutorials knowing that they have to contribute actively and cannot hide in the sheer numbers of tutorial participants. With a large tutorial class, the teacher has to create situations that engage all the students simultaneously. A good way of ensuring maximum participation is to break up the class into smaller work groups. Such a method allows the following:

- Each group works on tasks set by the teacher, much as individuals would have done in the small tutorial classes of the past. In a small group of four or five students, an individual will find it more difficult to 'opt out' than if he or she were in a class of 20.
- The teacher will find it easier to engage with four or five small groups than with 20 or 25 individuals.

- Once the task is completed, a spokesperson from each group can present the group's findings, conclusions, or solutions to the rest of the class for discussion and evaluation. To prevent the same students presenting all the time, the teacher has to ensure that the spokesperson for each group varies from tutorial to tutorial.
- The academic discourse now takes place between these small groups, rather than between individuals.

2. Variation of classroom activities

Variety in activities becomes particularly important when one considers the fact that large-sized tutorials probably have to last for two hours rather than one. Even if the teacher gets students to work in small groups, it is usually impossible to do justice to the small groups' output in only one hour. Moreover, small groups cannot completely take over from individual performance, because not every task is suitable for group work. Therefore in order to maximise the learning experience of a large class, there has to be some variety in tutorial activities. Although tutorial activities are by nature subject specific, small-group work can be alternated with individual work. Also, the composition and size of the small groups can vary from tutorial to tutorial or can remain fairly constant, depending on the teacher's preferences.

Another type of classroom activity to consider could be project work, which in the past few years has become a very popular addition to the coursework requirements of many modules in a number of different faculties at NUS. A proliferation of project work has often meant, in effect, that some traditional-style tutorials have had to be forsaken in any given semester so that the teacher can provide a series of practical workshop sessions tailored either to the specific needs of small groups or for the general benefit of all participants regardless of

the nature of their topic. Tutors may wish to use a combination of project work and a variety of other individual tasks for their two-hour classes.

3. The physical environment

In order to facilitate large-group teaching, it is important to look carefully at the physical environment in which classes are conducted. In particular, two physical factors can either hinder or encourage the learning process:

- *Seating arrangement:* The larger the class size gets, the more important the tutorial room becomes. A great deal of the success of large-group teaching depends on one simple question: can the chairs in a tutorial room be moved or are they screwed together to form rows of seats? In order for the members of small groups to engage in constructive discourse, they have to be able to face each other and prepare written work together. Consequently, a tutorial room with rows of immovable seats or linear seating arrangement is not conducive to the effectiveness of small groups. In contrast, the best rooms will have furniture that allows variations in the sizes and seating arrangements of small groups without compromising the students' comfort.
- *Technical equipment:* Rooms that are used for large-group teaching should minimally be equipped with a

large whiteboard, an OHP, and ideally, multimedia facilities. A computer connected to a projector is a real help for the teacher when it comes to both assigning homework to small groups and receiving technical presentations in reply from the students. Where the students are concerned, groups no longer have to make transparencies or handouts in order to discuss their work in class. During their preparation, students do not have to meet physically to get their work done (thereby saving time): they can work on their own computers, communicate with each other through email and save the final product on a diskette, which they can then present in class for discussion. If the classroom computer has Internet access, even a diskette becomes unnecessary.

Large-group teaching can definitely offer enriching learning experiences for our students. But it requires teachers to put some effort into planning the tutorial carefully and the university to provide the facilities that make large-group teaching a real alternative to the small tutorials of the past. Nevertheless in whatever manner the teacher decides to conduct large-group teaching, it is absolutely essential that he or she shows genuine enthusiasm for the task in hand and seeks to encourage her or his students to use their time profitably. After all, motivation is a key weapon in a teacher's armoury. ■

Keys to Effective Large-group Teaching

available for consultation even though I'm not your personal tutor. Come see me if there is something in the lecture that bugs you." Because we've got 15 minutes before the next group comes, I remain in class and take my time to pack up my notes so that students who want can immediately come and ask me questions. So these are some of the things I think you need to do to connect with your students. If they think you are a concerned and conscientious teacher, no matter how inadequate you feel, they will give you a lot of credit for that and you will do much better on your student reviews than you would have thought possible.

Third, learn from your mistakes. Someone once asked me: "Should I begin a lecture by telling a joke?" Now we all know some people have got what it takes to tell a joke, others don't. I never really feel that I do. So I never start by telling a joke. Because when your joke falls flat, your whole class will become very tense because they will feel guilty that they did not laugh and they will wonder when your next joke is coming. You will also be tense because you will think: "Why didn't they laugh? What's wrong with me?" So don't. But in the course of the class, maybe you will say something meaningful that also happens to be funny. For example, I didn't set out consciously to make

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you all laugh. But in the process of this session, you all have laughed and I'm very glad for it because it helps to ease the tension, it gets everyone to relax, it's also a good distraction.

Last, but not least, don't worry about your first lecture or class. No matter how bad you think it is, as long as you prepare, you should be OK. For example, one of the first times I gave a public talk was at an NUS Welcome Convention for new students in Orientation Week. I was in the Forum: in front of me there were about 1000 students and behind me were the Vice-Chancellor, the Deputy Vice-Chancellor, the Deans of all faculties, the Registrar, Director of the Personnel Department, etc. I was so nervous that I couldn't stop shivering while I was giving the talk. But you learn from these things. No. 1: I always have a podium in front of me when I give a talk so that in case I shiver, it won't be so noticeable. No. 2: it's important to wear baggy clothes so that when you do shiver it is not so obvious. Leaving aside the levity, the more important point is that what got me through that talk was the fact I had prepared for it. I knew exactly what it was I was going to say. No matter how nervous I was, that gave me a great deal of confidence. Therefore preparation is ultimately the key. ■

Enhancing Learning in a Large-class Session: Some Issues

Ms Chandrama Acharya

Research Assistant, CDTL

The typical large-class setting is generally lecture-centred and minimises student participation, leaving little opportunity for effective learning, as students tend to learn by memorising terms and concepts to pass final exams. Consequently, by fostering memorisation of lower-level factual contents, the lecture-centred large-class session is not very successful in promoting long-term knowledge retention, transfer of knowledge to new situations, higher order thinking and motivation to learn further (McKeachie, 1986).

Nevertheless, more and more teachers are writing about how they have tried to improve the effectiveness of large-group teaching by applying a number of small-group techniques in large classes and making learning a more participatory and active process. However for small-group techniques to work in a large-class setting, it is vital that students are allowed time to adjust to the new situation (Cooper & Robinson, 2000). Students more used to the traditional lecture environment may not be accustomed to taking part in problem-solving exercises or brainstorming in small groups as part of the class. They may feel that learning is an individual exercise and sharing thoughts in groups may be unfamiliar to them. So the foremost task for an instructor who wishes to apply small-group work in the lecture environment is to convince the students that learning can be done collaboratively and to train the students to cooperate with each other. For example, Helen Place describes the process of developing such skills:

“Students do not collaborate naturally. They have been taught to compete, and not work together... When I explain what I am doing in the class, I make an analogy to any sport. I tell the class that I can solve these chemistry problems and they can’t—yet. The only way they can learn to do it is to do it for themselves. I say to them, ‘I am making you practice, just like practicing for football.’ This is directed, coaching practice, which after a while leads to competence...It usually takes me about half the semester before students really get into the rhythm of working problems with their neighbors in the class.” (as quoted in Cooper & Robinson, 2000, pp. 23–24)

For learning to be accomplished in large classes, three levels of interaction must be addressed:

Student-to-Teacher Interaction

To develop effective student-teacher interaction, the teacher could apply the following during lectures:

- Ask friendly questions, listen carefully, and find something good to say about even ‘incorrect’ or off-base replies. Be willing to wait, even if it seems an eternity, to get a response.
- Use teaching cases and conduct the class as a case discussion rather than as a lecture.
- Include an open question/polls section at some point and ask for votes.
- Pause at critical points, pose a question to students and ask them to take a few minutes to write down their answers. By writing something down, each student has a chance to think about his/her own response ahead of time and they will feel more comfortable giving comments during a discussion.
- Ask for volunteers to make short presentations and lead the discussion for a change. Giving students more responsibility will often make them more motivated to participate in the class.
- Carry out class research or surveys to understand students’ needs in large classes and their deficiencies in comprehending the subject matter.
- To promote discussion outside the classroom, encourage students to approach you personally after classes during office hours, write to you via email and web-based courseware (e.g. IVLE), and/or submit written response papers.

The student-teacher interaction is often a two-way process. When the teacher encourages students to participate more actively in class, students may be more motivated to learn. When they are more interested in the subject matter, they will ask for additional information, be more forthcoming in sharing their own personal experiences in relation to the topic, and will volunteer to take part in activities. Their attentiveness and willingness to learn will in turn motivate the teacher to teach.

Student-to-Student Interaction

To promote interaction among students in a large class, first either reduce the class size or break the class up

into smaller groups. Groups can be formed on an ad-hoc or a more permanent basis and must be given clear directions for the ensuing group activity. For instance during a lecture, the lecturer can ask each student to turn to his/her immediate neighbours to introduce themselves and form temporary small *buzz* or *affinity* groups to discuss a question/problem for a few minutes (Mohan, 2000). In contrast, students may be encouraged to form cooperative *base* groups that are longer term in nature; in such groups, student members have the responsibility to provide one another with support, encouragement and assistance to make academic progress (Johnson, Johnson & Smith, 1998).

Another highly effective strategy is the *jigsaw* in which each student in a study group is responsible for learning a portion of the material and conscientiously teaching what he/she has learnt to other group members. In this strategy, the teacher selects the materials, structures the group, and monitors its activity to ensure quality learning and help students to summarise and synthesise concepts (Smith, 2000). The philosophy behind this strategy is encapsulated by Seneca's concept: "*Qui docet discet*", or "When you teach, you learn twice" (Whitman, 1988).

Student-to-Material Interaction

Interaction between the learner and the subject content under study is the process of intellectually interacting with learning materials that results in changes in the learner's understanding of the subject. Student-material interaction occurs within a class as well as during the students' individual study sessions. It could be as simple as rewinding and reviewing part of a videotape for clarification, or as complex as the process of archival research. Other examples of interaction with materials include: reviewing and expanding on lecture notes, looking up definitions in reference books, reading the materials presented in a course website or IVLE, and searching the Internet.

The teacher's role is to encourage students to frequently interact with their course materials through completing group assignments, reaction papers, case studies, and other class activities on a regular basis. To facilitate student-material interaction, the teacher should give clear instructions for the course content and evaluation. In addition, the mode of delivery/presentation of materials by the teacher is vital in promoting student-material interaction. For example, things that can interest and motivate learners include:

- the quality of the lecturer's voice;
- the quality of the fonts and graphics in an overhead projector slide/PowerPoint display and/or in books, study guides/handouts/other printed matter;
- the pictures and sounds of a television programme/video;

- the text, pictures and sounds of multimedia or World Wide Web resources.

Teachers often claim that students do not read. To overcome this obstacle, the teacher could encourage students to adopt the SQ3R (*Survey, Question, Read, Recall and Review*) approach effectively used by Scott, Buchanan and Haigh (1997). To promote recall and retention, urge students when working in small groups to keep written notes of their discussions that they can later refer to when necessary.

For deep learning resulting in subject mastery to occur, it is necessary for students to be actively involved in the learning process (Fosnot, 1989). Hence it is necessary for all three types of interaction discussed above to take place so that learning can be achieved in a large-class setting. If students are unable to interact with course content/materials, communicate with their teachers, and/or support their peers and discuss topics with fellow students, the desired learning outcomes are unlikely to be attained. For a course taught in a large-class format to be successful, it is essential for the teacher to promote student interaction with instructors/fellow students/course materials at different levels and depth, thereby facilitating the active involvement of students in the learning process.

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Large-group Teaching: Adding Value and Optimising Educational Outcomes

Professor Matthew C.E. Gwee

Associate Director, CDTL
Department of Pharmacology

and

Associate Professor Tan Chay Hoon

Department of Pharmacology

Our primary role as teachers is to facilitate, motivate and enhance student learning. We are accountable to our students in ensuring that the quality of education we provide will enable them, not only to achieve the more immediate goals of a course curriculum, but also to become the useful citizens of tomorrow who can make significant contributions to the nation. In this context, it is not only what we teach but, also, *how* we teach that will impact strongly on the quality of education we can provide. It is imperative then that we should adopt best teaching practices that will best facilitate, motivate and enhance student learning.

Large-group Teaching and the Lecture Method

To achieve overall educational goals, it is essential then for us to select effective instructional strategies. *Large-group teaching* (LGT) is often used mainly because it serves as an efficient (but not necessarily always effective) and economic way of delivering instruction to large numbers of students (e.g. 50–500) at a given venue. A common instructional strategy used in LGT is the *lecture method*—considered a highly traditional, but still widely used, mode of teaching in many institutions of higher learning, including NUS.

Traditionally, the lecture is focused on students learning course content mainly through passively receiving information transmitted by the teacher (the *sage-in-centre stage*), i.e. essentially a *monologue that informs* students of what teachers perceive as their learning needs but with little, if any, involvement of the students. A major criticism levelled against the traditional lecture is that often the overwhelming

content and scope of lectures lead to *information overload* that assumes all students “have high working-memory capacities”¹. Thus, this will promote *rote-learning* (*memorise, recall, regurgitate in examinations*) with consequent *intellectual anaemia*. Moreover, the traditional lecture tends to create in students a state of *high-dependency on teachers* for their learning needs.

Although criticisms of the traditional lecture are generally fair comment, it should also be recognised that a dedicated teacher, with mastery of and *passion* for his subject matter, can deliver a highly enjoyable, captivating and intellectually stimulating lecture that stirs the mind to think deeply and critically. More importantly, such a lecture can even *inspire* and motivate student learning.

It is passion that creates the intense, driving, transcending feeling that can raise lecturing to its special plane of greatness. And passion cannot be taught. It is the key to effective learning and to command of the essential communication strategies. (Weaver & Cotrell, 1987)

However, even experienced and dedicated teachers have found it difficult to reach this height of quality lecturing which requires much *charisma*—a gift that not many of us as teachers are endowed with. How then can we still optimise the educational outcomes of delivering a lecture in a LGT environment?

1. J.L. Cooper & Pamela Robinson. (Spring 2000). ‘The Argument for Making Large Classes Seem Small’. *New Directions for Teaching and Learning*, No. 81: 5–16.

Large-group Teaching: Going Beyond Tradition

The large lecture class...constitutes a potential learning arena where interaction, active participation, and student motivation can occur. (Erickson & Erickson, 1979)

More recently, arising mainly from criticisms of traditional teaching practices and with more evidence from research in constructivism, information processing and cognitive development, there is firm recognition that teachers need to *actively involve students* in the educational process itself in order to motivate and achieve more effective student learning. This represents a fundamental shift in educational paradigm from teaching to learning, in which students need to construct their own knowledge and understanding of materials they are learning and consolidate it within their own cognitive structures. Such an approach to learning is to enhance *deep learning* that will result in greater *mastery* of academic content.

Students therefore need to be engaged in *active-interactive* learning during the instructional process itself which should incorporate *small-group inquiry and reflection*. It may seem quite inappropriate to apply a small-group learning approach to a LGT environment. However, elements of *small-group dynamics* have been adapted for and applied to LGT with convincing evidence of much better educational outcomes, including enhancements in retention and recall of information, knowledge application to new and novel situations, critical thinking and problem-solving skills, communication and interpersonal skills, co-operative learning skills and motivation of student learning. The active-interactive small-group learning approach also helps to lay the foundation for the development of independent, self-directed, life-long learning skills.

Making Large Classes Seem Small: A Matter of Adaptation and Imagination

Because identifying and challenging assumptions, and exploring alternatives, involve elements of threat and risk taking, the peer support provided by a group of others also trying to do this is a powerful psychological ballast to critical thinking efforts. (Brookfield, 1987)

The process of *active-interactive learning*, in the context of large classes, is essentially achieved through the active engagement of two or more students in *discussion* at various intervals of time during a lecture carefully structured by the teacher. Such discussion teaching-learning sessions incorporate the elements of *listening, talking, questioning, responding, reflecting, exchanging viewpoints, debating, writing answers and comments to questions, and reading assignments for class discussion*. Thus, students learn through *social interaction* which compels them to comply with the code of social behaviour and they learn, not only as individuals, but also with and providing mutual support and respect for one another. *Peer teaching and learning* ('All teach, All learn'), a powerful learning tool in the educational process, then forms an important aspect of such a large group lecture. Students learning together in small groups therefore help create learning communities that have a critical influence in the development of higher-order thinking.

The Structure Of Small Groups In LGT

Small-group strategies usually used in large-group lectures are classified according to the complexity of the group structure and that of the intellectual problems and tasks. The *informal* small-group strategies use "*brief in-class discussions that begin, end, or punctuate a lecture*"² that involve pairs or teams of students: e.g. in the *think-pair-share* strategy, the teacher punctuates a lecture with a question, test item, or issue for students to consider briefly (*think* phase), first as individuals, and then turning to a student sitting nearby (*pair* phase) to discuss their responses with one another. Then several pairs will share their responses with the class if time permits (*share* phase). Other informal small-group strategies used have been referred to as *think-pair-square*, *ConcepTest*, *quick-thinks*, *minute paper*, *scripted co-operative learning* and *concept maps*.

The *formal* small-group strategies are generally extensions of the informal 'turn to your neighbour' type with much greater involvement of individual students in the preparation before discussion in pairs or threes, several to-and-fro discussions between small groups and the whole class,

2. J.L. Cooper & Pamela Robinson. (Spring 2000). 'Getting Started: Informal Small-Group Strategies in Large Classes'. *New Directions for Teaching and Learning*. No. 81: 17-24.

as well as specific role assignments to the entire group structure. Permanent, fixed membership groups are also used in order to enhance cohesiveness and the level of discussion. A common strategy used is the individual *journal-writing assignments* together with the formation of collaborative groups of three or four students who are each assigned to a specific rotational role as *reporter*, *scribe*, *timekeeper*, or *critic*. Other formal small-group strategies include: in-class project work, jigsaw strategies, structured academic controversy, base groups, problem-based learning, restructured lecture-recitation-laboratory, and eliminated lecture, substitution of hands-on laboratory. Several of the formal small-group strategies require restructuring of large classes to accommodate more complex in-class activities.

Large-group Teaching: Opportunities and Challenges

Incorporating small-group activities in a large-group teaching environment is fast gaining acceptance as an innovative educational strategy that adds value to and optimises the educational benefits and outcome of student learning. It also creates opportunities for teachers to apply best teaching practices that will bring out not only the best in our students, but also the best in ourselves. However, it also poses significant challenges for us as teachers to reappraise our own teaching practices and to enhance our own understanding of how students learn in order to be able to meaningfully shift the educational paradigm from teaching to active-interactive learning and, thus, in further enhancing our role as teachers to that of *designer*, *choreographer* and *manager* of the learning environment.

In our role as teachers, we need to *inform* and to actively *involve* our students in the learning process, and also strive to *inspire* them. Teaching will surely pay dividends if we teachers pay interest. So let's teach and flourish.

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contributors

Tan Cheng Han & participants of the 21 Feb 2001 session of the Professional Development Programme, Malcolm Murfett, Ulrike M. Murfett, Chandrama Acharya, Matthew C.E. Gwee, Tan Chay Hoon

advisor

Daphne Pan

editors

Verena Tay
Christina Low

layout

Ma Lin Lin

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Comments, suggestions and contributions should be addressed to:

The Editor, *CDTL Brief*
Centre for Development of Teaching and Learning
Central Library Annexe, Level 6
National University of Singapore
10 Kent Ridge Crescent
Singapore 119260

Tel: (65) 874-3052
Fax: (65) 777-0342
Email: cdtpost@nus.edu.sg
<http://www.cdtl.nus.edu.sg>