

Teaching Large Classes of Engineering Students



Ben Young and Irene Lo

Department of Civil Engineering

Hong Kong University of Science & Technology

17 May 2004

Teaching & Learning Symposium

SCOPE OF THE PRESENTATION

- **INTRODUCTION**
- **BACKGROUND**
- **TEACHING APPROACHES**
- **IMPLEMENTATION OF 7-MUST**
- **CONCLUSIONS**

SCOPE OF THE PRESENTATION

- **INTRODUCTION**
- **BACKGROUND**
- **TEACHING APPROACHES**
- **IMPLEMENTATION OF 7-MUST**
- **CONCLUSIONS**

INTRODUCTION

- Teaching large classes using conventional face-to-face lecture requires special teaching skills.
- Large Class \Rightarrow \sim 60 – 1000+ students.
- Asian students are relatively passive compared with Western students due to cultural differences.
- It is a challenge to teach large classes with a group of passive students.
- It is also a challenge for students to learn in large classes.

Objectives of this study:

- (1) To share the experience of large class teaching by the authors.
- (2) To propose a teaching approach named as “7-MUST”.

SCOPE OF THE PRESENTATION

- INTRODUCTION
- BACKGROUND
- TEACHING APPROACHES
- IMPLEMENTATION OF 7-MUST
- CONCLUSIONS

BACKGROUND

- The authors have teaching experience in both Asian and Western countries for over 10 years.
- First author ⇒ Teaching Assistant in Australia,
Lecture in Singapore and Hong Kong.
- Second author ⇒ Teaching Assistant in Taiwan and US,
Lecture in Hong Kong.

SCOPE OF THE PRESENTATION

- INTRODUCTION
- BACKGROUND
- TEACHING APPROACHES
- IMPLEMENTATION OF 7-MUST
- CONCLUSIONS

TEACHING APPROACHES

When teaching large classes, instructors often face difficulties such as:

- Difficult to attract the attention of students
- Difficult to interact with students
- Not easy to have eye contact with every single student
- Unlikely to recognize students' names

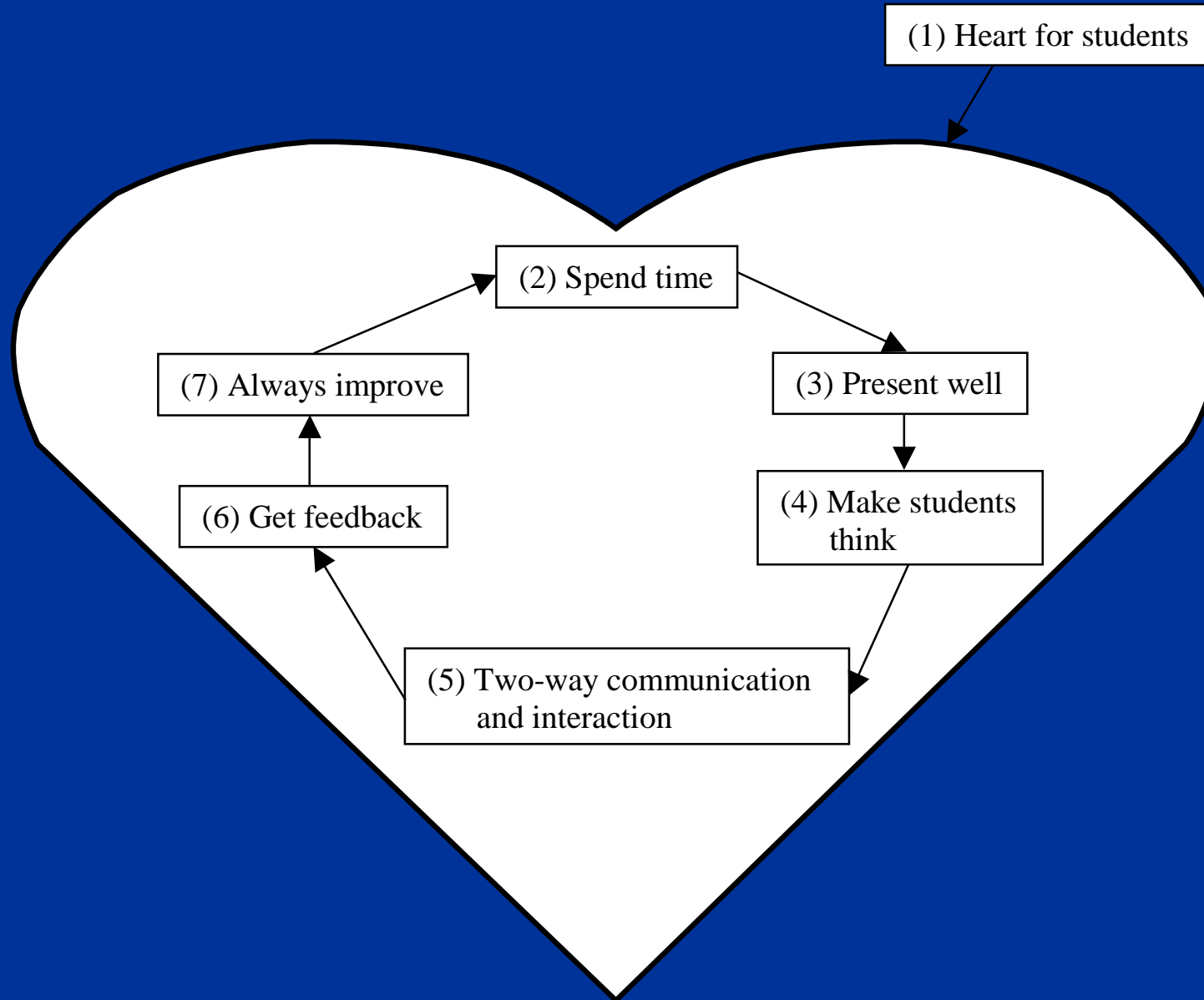
The authors have implemented a “7-MUST” teaching approach to overcome the above problems.

TEACHING APPROACHES

The 7-MUST teaching approach includes the following:

1. **Must** have a heart for students
2. **Must** spend time to prepare for lectures
3. **Must** present well in lectures
4. **Must** always make students think in lectures
5. **Must** have two-way communication/interaction in lectures
6. **Must** get feedback from students
7. **Must** always think of ways to improve

7-MUST TEACHING APPROACH



SCOPE OF THE PRESENTATION

- INTRODUCTION
- BACKGROUND
- TEACHING APPROACHES
- IMPLEMENTATION OF 7-MUST
- CONCLUSIONS

IMPLEMENTATION OF 7-MUST

(1) Must have a heart for students

- Good instructor \Rightarrow Have a heart of understanding, enthusiasm, patience, and kindness for students.
- Extra patience to students \Rightarrow Different levels of student ability varying from mediocre to top-notch exist in a large class.
- Some instructors teach from their “high level” of knowledge \Rightarrow Beyond the level of students’ learning abilities.

IMPLEMENTATION OF 7-MUST

(1) Must have a heart for students

- The instructor must also have patience for less competent and passive students \Rightarrow By explaining concepts repeatedly in different ways and through different methods.
- Other than teaching technical materials, it is also important to care for the welfare of students.

IMPLEMENTATION OF 7-MUST

(2) Must spend time to prepare for lectures

- A good instructor must be willing to spend time in preparing lectures.
- It is important to revise lecture notes and tutorial questions from time to time to include up-to-date engineering technology.
- Therefore, lecture preparation is a continuous process.

IMPLEMENTATION OF 7-MUST

(3) Must present well in lectures

- It could make a significant difference between an instructor with good presentation skills and the one who delivers materials in a straightforward manner.
- Good voice and eye contact are powerful tools.
- In presenting abstract theories, it is necessary to use diagrams and models to illustrate the key components of the concepts.

IMPLEMENTATION OF 7-MUST

(3) Must present well in lectures

- A student from Singapore once remarked “*A diagram explains a thousand words and a model explains a million words*”.
- Use illustrations with student involvement for explaining the teaching materials.
- Other useful teaching tools have been presented in the first presentation.

IMPLEMENTATION OF 7-MUST

(4) Must always make students think in lectures

- In large classes, students are often like signal receivers without data processing.

The following activities can stimulate students' thinking:

- Get students to note down some lecture materials during the lecture \Rightarrow To keep their minds active.
- Give some apparently correct but wrong examples after teaching a theory \Rightarrow Ask the students to identify the mistakes in the example.

IMPLEMENTATION OF 7-MUST

(5) Must have two-way communication/interaction in lectures

- Ask questions in the class.
- Even if there is no response from the students \Rightarrow Asking questions is not meaningless, because students might have already answered the questions in their minds.
- The purpose of two-way communication/interaction can be achieved.

IMPLEMENTATION OF 7-MUST

(6) Must get feedback from students

- Get feedback \Rightarrow At the beginning of the semester, especially in the first few lectures, rather than waiting until the end of the semester (verbal or written).
- It is important to get feedback from both the top and poor academic students.
- The main purpose of getting feedback is to improve teaching quality.

IMPLEMENTATION OF 7-MUST

(7) Must always think of ways to improve

- A good instructor must always have a positive attitude to improve his/her teaching.
- If the instructor thinks that his/her teaching is good, he/she will never improve.
- How to improve? \Rightarrow Review and revise teaching materials on clarity of lecture notes, the pace of the teaching and the use of illustrations to explain difficult concepts.

SCOPE OF THE PRESENTATION

- INTRODUCTION
- BACKGROUND
- TEACHING APPROACHES
- IMPLEMENTATION OF 7-MUST
- CONCLUSIONS

CONCLUSIONS

- Conventional face-to-face lectures for large class teaching require special teaching skills.
- Asian students are comparatively more passive than Western students due to cultural differences.
- The authors have developed the 7-MUST teaching approach for large engineering classes in Asian countries.

CONCLUSIONS

- It has been proven successfully by obtaining good teaching evaluations from students in Hong Kong and Singapore Universities.
- Teaching is considered as equally important as research.
- As responsible instructors, it is our obligation to do the very best to teach students because the students of today will be the engineers of tomorrow.

Thank you

